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Cross-curricular projects integrating knowledge, principles, and values of various disciplines

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To access more information on the given topics

Group Discussion
To help the students understand the topics in an interactive manner

Brain Developer & Worksheets
For self assessment of the concepts learnt

Incorporates NEP 2019 Guidelines in Activities and Projects

Life Skills and Values   *Art Integration*   *Interdisciplinary*

●●● CONTENTS ●●●

●●● CONTENTS ●●●

NUMBER SYSTEM

In early days when there were no means of counting, people used to count with the help of fingers, stones, pebbles, sticks, etc. These methods were not adequate and had many limitations. To overcome these limitations, many number systems were introduced with the passage of time, like:

➤ Decimal number system

➤ Binary number system

➤ Octal number system

➤ Hexadecimal number system

A number system is a set of values used to represent different quantities.

DECIMAL NUMBER SYSTEM

The need for counting paved the way to introduce Decimal number system in which digits 0,1,2,3...9 are used to form any number. Most of our arithmetic operations are performed with decimal numbers.

Decimal number system consists of ten digits i.e., 0 to 9 with the base 10. Each number can be used individually or they can be grouped to form a numeric value. E.g., 82, -256, 52.87, etc. The value of each digit in a number depends upon the following:

➤ The face value of the digit

➤ The base of the number system

➤ The position of the digit in the number

Each position represents a specific power of base (10). The right most digit of a number is called **Least Significant Digit** whereas the left most digit is called **Most Significant Digit**. For example, the number 547 can be represented in the following way:

Example

$7 * 10^0$ units	=	7
$4 * 10^1$ tens	=	40
$5 * 10^2$ hundreds	=	500
		547
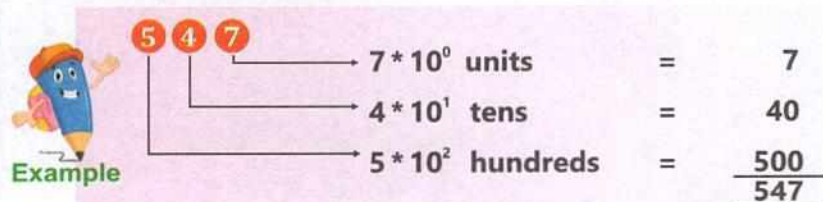
OBSERVATION

The positional value of each digit increases ten folds as we move from right to left. In the above mentioned example; 5, 4, and 7 are the face values and their place values are hundreds, tens, and units respectively. The place value depends on the position of the digit in the number.

Now let us discuss about the various types of number systems that are used in a computer.

BINARY NUMBER SYSTEM

The Binary number system consists of only two digits, i.e., zero and one (0 and 1). Since this system uses two digits, it has the base 2. All digital computers use this number system and convert the input data from the decimal format into its binary equivalent.

WHY BINARY?

A computer cannot understand human language, rather it understands only the binary code. Therefore, the data that is entered into a computer is converted into its binary equivalent. It further converts the binary results into their decimal equivalents for output.

CONVERSION OF DECIMAL INTO BINARY NUMBER SYSTEM

The equivalence between binary and decimal numbers can be understood with the given examples. To convert a decimal number into binary number, follow the given rules:

Step 1: Divide the given decimal number with the base 2.

Step 2: Write down the remainder, divide the quotient again by 2.

Step 3: Repeat step 2 till the quotient is zero.

Let us understand the conversion of Decimal number into Binary number with the given examples:

Example 1:

2	25	
2	12	1 → Least Significant Digit
2	6	0
2	3	0
2	1	1
	0	1 → Most Significant Digit

Thus $(25)_{10} = (11001)_2$

The base of number is given as subscript.

Example 2:

2	321	
2	160	1 → Least Significant Digit
2	80	0
2	40	0
2	20	0
2	10	0
2	5	0
2	2	1
2	1	0
	0	1 → Most Significant Digit

Thus $(321)_{10} = (101000001)_2$

Remainders, which are obtained in each step are written in reverse order, i.e., placing the Least Significant Digit at the top and Most Significant Digit at the bottom, to form the binary equivalent of the decimal number.

BINARY TO DECIMAL NUMBER

To convert a binary number into decimal number, follow the steps given on the next page.

➤ Multiply each binary number with its positional value, which is in terms of powers of 2, starting from the extreme right digit.

➤ Increase the power one by one, keeping the base fixed as 2.

➤ Sum up all products to get the decimal number.

Example 1:

$(1010)_2$

0×2^0	-	Units	= 0
1×2^1	-	Tens	= 2
0×2^2	-	Hundreds	= 0
1×2^3	-	Thousands	= 8

Thus $(1010)_2 = (10)_{10}$

Example 2:

$(1\ 0\ 0\ 1)_2$

$1 \times 2^0 = 1$
$0 \times 2^1 = 0$
$0 \times 2^2 = 0$
$1 \times 2^3 = 8$

Thus $(1001)_2 = (9)_{10}$

Example 3:

$(110001001)_2$

$= 1 \times 2^8 + 1 \times 2^7 + 0 \times 2^6 + 0 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 0 \times 2^2 + 0 \times 2^1 + 1 \times 2^0$

$= 256 + 128 + 0 + 0 + 0 + 8 + 0 + 0 + 1$

$= 393$

Thus $(110001001)_2 = (393)_{10}$

➤ OCTAL NUMBER SYSTEM

The Octal number system (Oct) consists of 8 digits: 0 to 7 with the base 8. The concept of Octal number system came from the Native Americans as they used to count numbers by using the space between their fingers rather than using their fingers. The procedure of 'octal to decimal' conversion is similar to 'binary to decimal' conversion, the only difference is the change of base. So, if we want to convert any octal number to decimal number, we have to start multiplying the digits of the number from right hand side with the increasing power of 8 starting from 0. And finally summing up all the products.

Example 1:

$(345)_8$

$(3 \times 8^2) + (4 \times 8^1) + (5 \times 8^0)$

$192 + 32 + 5$

Thus $(345)_8 = (229)_{10}$

Example 2:

$(317)_8$

$(3 \times 8^2) + (1 \times 8^1) + (7 \times 8^0)$

$192 + 8 + 7$

Thus $(317)_8 = (207)_{10}$

➤ HEXADECIMAL NUMBER SYSTEM

This number system consists of 16 digits: 0–9 and the letters A–F, where A-F represents digits 10 to 15 with the base 16. This number system is also known as Hex, where Hex=6 and Decimal=10, so it is called **Hexadecimal**. The procedure of converting hexadecimal to decimal is similar to the methods shown above, the only difference is the change of base. To convert hexadecimal number to decimal, multiply the number with base 16.

Hex to Decimal Conversion

Hex	Decimal Value
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Hex	Decimal Value
10	A
11	B
12	C
13	D
14	E
15	F

Example

Example 1:

$(3B)_{16}$

$(3 \times 16^1) + (11 \times 16^0)$

$48 + 11$

Thus $(3B)_{16} = (59)_{10}$

Example 2:

$(4D2)_{16}$

$(4 \times 16^2) + (D \times 16^1) + (2 \times 16^0)$

$1024 + 208 + 2$

Thus $(4D2)_{16} = (1234)_{10}$

COMPUTER ARITHMETIC

As a computer understands only the binary code, the data input by the user is converted into binary code for processing. This processing may involve various kinds of arithmetic operations, such as addition, subtraction, multiplication, division, etc., on binary numbers.

BINARY ADDITION

The technique used to add binary numbers is very easy and simple. This is performed in the same way as you perform addition with decimal numbers. The following table illustrates the addition of two binary digits:

Binary Addition

a	b	a + b = c
0	0	0 + 0 = 0
0	1	0 + 1 = 1
1	0	1 + 0 = 1
1	1	1 + 1 = 10

While adding 1 + 1, the output will be 10, where 0 is written under the same column and carry over 1 is shifted to the next place as it happens in decimal number addition.

Example 1:

Compute $(1000)_2 + (111)_2$

```
  1000
+ 0111
------
  1111
```

Example 2:

Compute $(11111)_2 + (1011)_2$

```
  1111 ← Carry over
  11111
+ 01011
-------
 101010
```

BINARY SUBTRACTION

The rules given in the table must be followed to perform binary subtraction:

NOTE

The number is borrowed when 1 is subtracted from 0 (10 - 1 = 1).

Binary Subtraction

a	b	a - b = c
0	0	0 - 0 = 0
1	0	1 - 0 = 1
1	1	1 - 1 = 0
0	1	0 - 1 = 1

Example 1:

Compute $(1111)_2 - (1010)_2$

```
  1 1 1 1
- 1 0 1 0
---------
  0 1 0 1
```

Example 2:

Compute $(1100)_2 - (11)_2$

```
                    Again
        Borrowed 1   Borrowed 1
             →10→
      Balance  Balance  Number is now
         0        1        10
    1    1        0        0  -1
                              1
  - 0    0        1        1
    ---------------------------
    1    0        0        1
```

BINARY MULTIPLICATION

The rules for performing multiplication using binary numbers is same as that of the decimal numbers. The given table illustrates the multiplication of two binary digits:

Binary Multiplication

a	b	a * b = c
0	0	0 * 0 = 0
0	1	0 * 1 = 0
1	0	1 * 0 = 0
1	1	1 * 1 = 1

Example 1:

Compute $(101)_2 \times (11)_2$

```
         101
       × 11
       -----
         101
      + 101×
       -----
Sum =  1111
```

Example 2:

Compute $(1111)_2 \times (101)_2$

```
        1111
      × 101
      -------
        1111
       0000×
    + 1111××
      -------
    1001011
```

BINARY DIVISION

The method to perform division of two binary numbers is same as that of decimal numbers. See the example given below:

Example 1: Compute $(110)_2 \div (10)_2$

```
          11  ←──────── Quotient
      10 ) 110 ←──────── Dividend
          10
          ───
          010
           10
          ───
           00 ←──────── Remainder
          ───
```

Example 2: Compute $(10000111)_2 \div (1001)_2$

```
            01111  ←──────── Quotient
     1001 ) 10000111 ←──────── Dividend
            1001
            ─────
            001111
              1001
            ─────
             01101
              1001
            ─────
             01001
              1001
            ─────
             0000 ←──────── Remainder
            ─────
```

RECAP

➤ The commonly used number system is Decimal number system with the base 10.

➤ The right most digit of a binary number is called Least Significant Digit whereas the left most digit is called Most Significant Digit.

➤ The Binary number system consists of two digits i.e., 0 and 1 and has the base 2.

➤ The Octal number consists of 8 digits and has the base 8.

➤ The Hexadecimal number consists of 16 digits and has the base 16.

BRAIN DEVELOPER

SECTION - A

A. Fill in the blanks.

1. The base of Binary number system is ....

2. The base of .... system is 10.

3. Octal Number system consists of .... digits.

4. In Binary addition, 1+1 equals to ....

5. .... number system is understood by the computer system.

6. .... uses 16 symbols to represent numbers.

7. In Binary subtraction, 1-1 equals..

B. State True or False.

1. You cannot perform arithmetical operations on binary numbers.

2. The decimal number system consists of 10 digits i.e., 0 to 9.

3. The method to perform division of two binary numbers is not the same as that of decimal numbers.

4. 1 multiplied by 0 equals to 0.

5. Charles Babbage introduced the concept of 0 (Zero).

6. The numbers used in Octal number system are 1 to 7.

SECTION - B

A. Multiple-choice questions.

1. .... introduced the concept of o (Zero).

   a. Ada Lovelace   b. Aryabhat   c. Bill Gates

2. A .... converts the decimal format into its binary equivalent.

   a. Digital Computer   b. Cell Phone   c. Abacus

3. A computer understands only... code.

   a. English   b. French   c. Binary

4. In Binary multiplication, 1x1 equals to ....

   a. 0   b. 1   c. 2

5. To convert Decimal number into Binary number, divide the number by...

   a. 2   b. 8   c. 10

B. Answer the following questions.

1. What is a Number system? Name the different types of number system used.

   ....

   ....

   ....

2. What are the rules to convert a Decimal number into a Binary number?

....

....

3. Write the rules to multiply two Binary numbers.

....

....

....

4. Briefly explain the Octal number system.

....

....

....

5. What do you understand by Hexadecimal Number System?

....

....

....

ACTIVITY SECTION

LAB SESSION   **Perfection Through Practice**

A. Convert the following Decimal numbers into Binary numbers.

a. 68	b. 987	c. 657

B. Convert the following Binary numbers into Decimal numbers.

a. 1011	b. 100110	c. 10101

C.   Perform Binary addition on the following.

a. 10101 + 00111	b. 1001101 + 1000101101	c. 1101 + 1001

D. Find the difference between the following Binary numbers.

a. 10011 - 01010	b. 11001001 - 01100110	c. 111 - 001

E. Multiply the following Binary numbers.

a. 101 x 011	b. 1011 x 101	c. 101010 x 1011

F. Divide these Binary numbers.

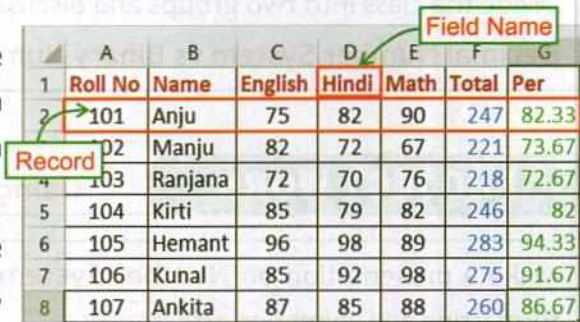| a. 1111 ÷ 11	b. 111001 ÷ 101	c. 111111111 ÷ 1011

USING EXCEL AS A DATABASE

A database is a collection of information related to a particular object, such as maintaining addresses and phone numbers, a list of library books, keeping students' record pertaining to academic and co-curricular achievements, keeping employees' information, etc. It helps the users to organise, retrieve, sort, and edit data as per their requirement.

Database consists of fields and records. In simple terms, records refer to rows and fields refer to columns in Excel.

FIELD : A column within a database that contains only similar type of data is called Field. For example, Roll No., Name, Address are different fields.

RECORD : A row in a database is called a Record that consists of the information about one person or one object. For example, in the given figure the data – 101, Anju, 75, 82, 90, 247, 82.33 of one student, forms a record.

FIELD NAME : It is a column label for the field in a database. All the field names appear in one row. For example – Roll No, Name, English, Hindi, Math, Total, Per are the field names in the given database.

	A	B	C	D	E	F	G
1	Roll No	Name	English	Hindi	Math	Total	Per
2	101	Anju	75	82	90	247	82.33
3	102	Manju	82	72	67	221	73.67
4	103	Ranjana	72	70	76	218	72.67
5	104	Kirti	85	79	82	246	82
6	105	Hemant	96	98	89	283	94.33
7	106	Kunal	85	92	98	275	91.67
8	107	Ankita	87	85	88	260	86.67

Figure 2.1: Excel Database

USING A FORM TO ENTER DATA

A Form is a window that contains numerous fields to enter, modify, and view one record at a time. Each field holds a field name so that any user who views the form or enter data in it, gets an idea of its contents. Forms often contain Command buttons and other controls that perform various tasks. When you enter information into a form, the data gets saved directly in the database.

NOTE

Before adding a record in the form, the worksheet must have field names at the top of each column. Microsoft Excel uses these field names as a label to ease the process of entering records in a form. **Make sure that there are no blank lines in the range of data.**

- In Excel 2016, the **Forms** option is hidden. To add a Form button, select **File > Options**. The **Excel Options** dialog box will open.
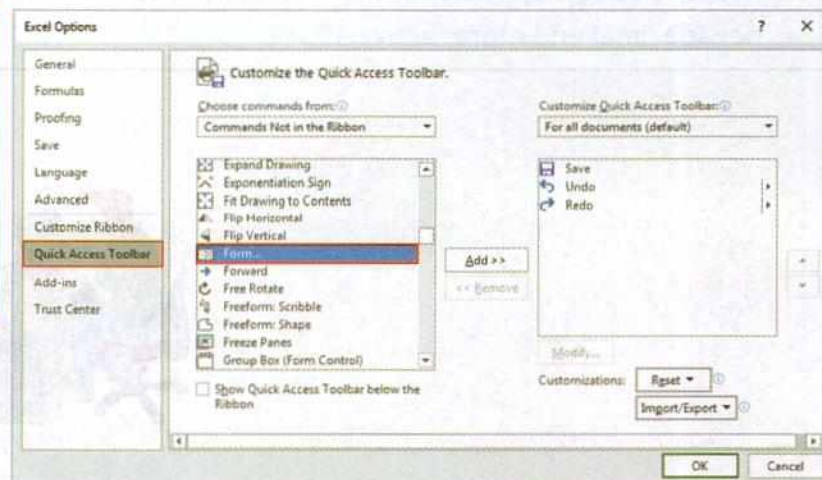
Figure 2.2: Excel Options Dialog Box

➤ Select the **Quick Access Toolbar** option in the left pane.

➤ Click on the drop-down arrow of **Choose commands from** the list box.

➤ Select **Commands Not in the Ribbon** option from the drop-down list and choose the **Form** command.

➤ Click on the **Add** button ⌷ Add >> ⌷. Click **OK** and you will find the **Form** button 🔲 on the **Quick Access Toolbar**.
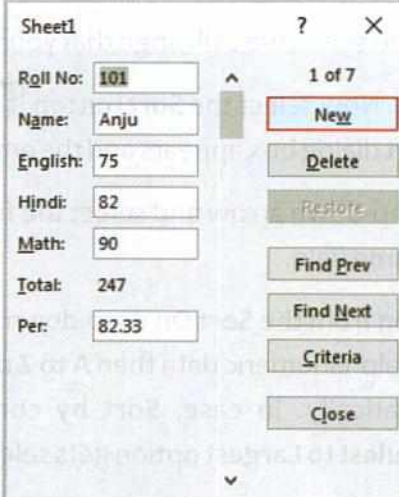
⏩ ADDING A NEW RECORD IN A FORM

Using the data form, we can add a new record in the database. Follow these steps to enter new records:

➤ Click on the cell **A1**. Select the **Form** button on the **Quick Access Toolbar**. The **Sheet1** dialog box appears. It contains the record of the first student in your database.

➤ To add a new record, click on the **New** button.

➤ Type the data in the respective fields of the Form.

➤ After you have finished typing data, press **Enter** key to add the row to the bottom of the range or table.

➤ You can move to the previous or next record by clicking on the **Find Prev** and **Find Next** buttons respectively.

➤ Click on the **Close** button to close the data form.

Figure 2.3: Adding a Record Using Form

⏩ SEARCHING A RECORD

This option is used to search the records with specific values.

➤ Click on the **Form** button.

➤ Select the **Criteria** button in the **Sheet1** dialog box.

➤ Type the data that you want to search in the appropriate field. For example, type **104** in **Roll No:** text box and press the **Enter** key.

➤ If the record exists and matches the given value for that field, it will be displayed. Otherwise, the first record will be displayed.

Figure 2.4: Searching a Record Using Form

DELETING A RECORD

To delete a particular record:

➤ Click on the **Form** button. In **Sheet1** dialog box, move to the desired record by clicking either on **Find Prev** button or **Find Next** button.

➤ After selecting it, click on the **Delete** button. Excel prompts you to confirm the operation. You cannot undo a row deletion after you confirm it.

SORTING DATA

Sorting means, arranging the data either in an ascending or descending order. In a worksheet, data can be sorted in rows on the basis of text, numbers or dates. Once the data is organised, it becomes easy to work on it.

Follow these steps to sort the given data:

➤ Open any worksheet and select the cell range that you want to sort.

➤ Click on any cell, say **B2**. Now select the **Sort** button [ZA] in the **Sort & Filter** group in the **Data** tab. The **Sort** dialog box appears and the entire database gets selected.

➤ Click on the **Sort by** drop-down arrow and select the field on the basis of which you want to sort the data. For example, select the **Name** field.

➤ Select the **Values** option from the **Sort On** drop-down list. Select the sorting order from the **Order** drop-down list. If **Sort by** contains alphanumeric data then **A to Z** option gets selected automatically. In case, **Sort by** contains numeric data then **Smallest to Largest** option gets selected.

➤ Select the **My data has headers** checkbox to exclude the first row, containing the column headings for sorting. Otherwise, uncheck the checkbox to include the first row headings in sorting.

Figure 2.5: Sort Dialog Box

➤ Click **OK**. The database will be sorted in descending order on the basis of **Name** field.

In Excel, you can also sort more than one column. For example, after sorting by **Name**, you want to arrange the list by **Roll No**.

To sort by more than one column, follow the given steps.

➤ Click on the **Add Level** button in the **Sort** dialog box. A new level gets added below the first level.

➤ Select the column name as **Roll No** in the **Then by** drop-down list and order of sorting as **Largest to Smallest** in the **Order** drop-down list in the new level. Click **OK**.
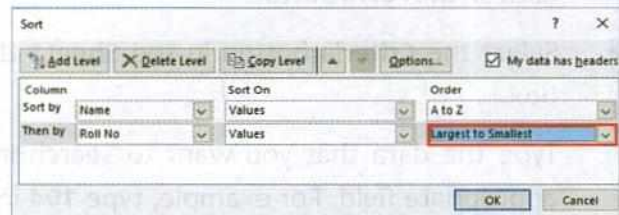
Figure 2.6: Adding Level

Excel 2013

In Excel 2013, also you can add, search, delete records using forms in the same way as you do in Excel 2016.

FILTERING DATA

The **Filter** feature is one of the interesting features of Excel which helps you to display only those records that meet the specified criteria and hide rest of the records.

➤ Select any cell within the database range, say **D1**. Click on the **Filter** button in the **Sort & Filter** group in the **Data** tab.

➤ Small arrows will be added in the column header. These arrows are used to specify conditions to filter the data.

➤ Click on the arrow next to the **Hindi** column header in cell **D1**. Uncheck the **Select All** check box to deselect all the check boxes. Now select the check boxes of the values **82** and **98** from the drop-down list. Click **OK**.

➤ You will notice that the list gets filtered and displays only those records that meet the specified criteria, i.e., records related to marks **82** and **98** in Hindi.

Figure 2.7: Using Filter Command

To clear all filters from the worksheet, click on the **Clear** button ✖ Clear present in the **Sort & Filter** group on the **Data** tab or click on the **Filter** button ▼ in the **Data** tab. If you have modified the data and want to filter the new data, click on **Reapply** button ▣.

USING ADVANCED FILTER

Advanced Filter option is used to filter the data in multiple fields using specified criteria, to copy the filtered records to a different location, or to find unique records. Let us use this option.

➤ Insert at least three blank rows above the range, which is to be used as a criteria range, by clicking on the **Home** tab and selecting the **Insert > Insert Sheet Rows** option.

➤ The criteria range must have column labels. There should not be any blank row between the criteria values and the range.

➤ Select the range **A4:D4**. Press **Ctrl+C** to copy the range.

	A	B	C	D
1	Name	Department	Designation	Salary
2				10000
3				
4	Name	Department	Designation	Salary
5	Anika	Development	Manager	20000
6	Manas	Production	Prod Manager	10000
7	Priya	Production	Sr. Prod. Manager	15000
8	Anuradha	Purchase	Manager	10000
9	Ganesh	Sale	Manager	12000
10	Sumita	Sale	Executive	8000
11	Saransh	Sale	Executive	8000
12	Girish	Store	Store Keeper	5000
13	Ramesh	Store	Store Keeper	8000

Figure 2.8: Using Advanced Filter

➤ Select the cell **A1** and press **Ctrl+V**. Type the criteria which you want to match in the row below the column labels. **Type = 10000** under the field name **Salary** i.e., **D2**.

➤ Click on a cell within the data range. Select **Data** tab and click on the **Advanced** button ☑ Advanced in the **Sort & Filter** group.

➤ You will notice the range is already defined in the **List range:** **$A$4:$D$13**.

➤ Select **Copy to another location** radio button in the **Action** section of **Advanced Filter** dialog box.

➤ Define the **Criteria range** box, by entering the reference of the criteria range, including the field names.
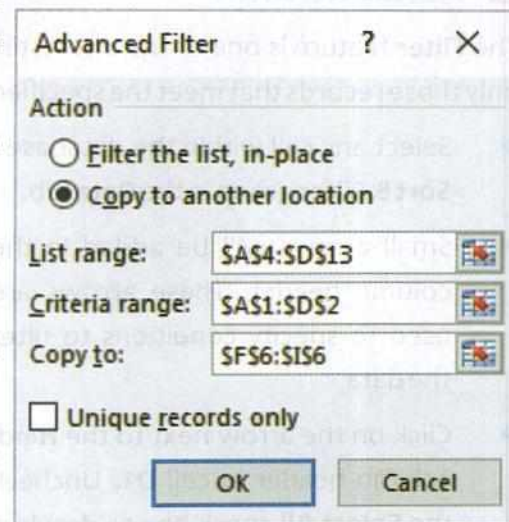
Figure 2.9: Advanced Filter Dialog Box

➤ Define the range of the target location where the filtered rows will be copied in the **Copy to** box, i.e., **$F$6:$I$6**. Click **OK**. The data will get filtered according to the specified condition and be copied in the place, which you have defined in the **Copy to** box.

	Name	Department	Designation	Salary
6	Name	Department	Designation	Salary
7	Manas	Production	Prod Manager	10000
8	Anuradha	Purchase	Manager	10000

Figure 2.10: Result of Advanced Filter

> **NOTE**
> In Microsoft Excel, you can also filter and sort the data by cell colour.

⟩ USING DATA VALIDATION

Data Validation is used to restrict the type of data or value that users enter a cell. Let us use data validation to restrict the data entry to whole numbers between 0 and 100.

➤ Select the cell range E5:E13. Choose **Data** tab > **Data Validation** 🖎 in the **Data Tools** group. The **Data Validation** dialog box appears. The **Settings** tab is selected by default.

➤ In **Allow** drop-down list, select the **Whole number** option.

➤ In **Data** drop-down list, **between** option is selected by default.

➤ In **Minimum:** text box, type **0**, and in **Maximum** text box, type **100**.

➤ Click on the **Input Message** tab. In **Title:** text box, type 'Validation'. In **Input message** box, type 'enter between 0 and 100'.

➤ Select the **Error Alert** tab and type 'Input is wrong' in **Error message** box. Click on **OK** to close the dialog box.

➤ If you try to enter data beyond the specified limit in the selected range, an error message will be displayed. Click on **Retry** to enter another value in the cell.

Figure 2.11: Data Validation Dialog Box

ADDING SUBTOTAL IN DATABASE

The Subtotal feature in a database helps us to manage, analyse, and extract specific information from rows of related data. To apply subtotals, the database must be sorted. Let us learn the use of this feature through the given table. Follow these steps:

➤ Open a new worksheet and enter the data as shown in the Figure 2.12.

	A	B	C	D
1	S.No.	Sales Executive	Month	Sales
2	1	Raman	October	125000
3	2	Mohit	October	320000
4	3	Prashant	October	285000
5	4	Prashant	November	335000
6	5	Mohit	November	222000
7	6	Raman	November	275650

Figure 2.12: Data for Subtotal

➤ Select any cell within the range, and choose **Data** tab > **Subtotal** option in the **Outline** group. The **Subtotal** dialog box appears. Choose 'Month' from **At each change in**: drop-down list.

➤ To calculate the sum of **Sales**, select **Sum** function from **Use function**: drop-down list.

➤ In **Add subtotal to**: list box, select the **Sales** checkbox.

➤ Deselect the **Replace current subtotals** option by clicking on its checkbox. This option overwrites the existing subtotal if present.

Figure 2.13: Subtotal Dialog Box

➤ The **Summary below data** checkbox is marked by default. This option will place the total below the data of each month.

➤ Click **OK**. The subtotals will be displayed as shown in the Figure 2.14.

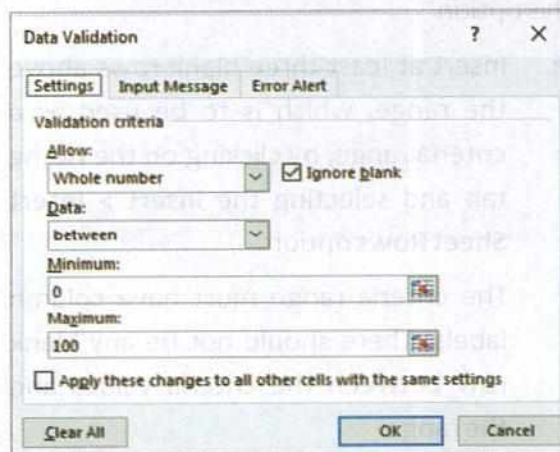|	A	B	C	D
1	S.No.	Sales Executive	Month	Sales
2	1	Raman	October	125000
3	2	Mohit	October	320000
4	3	Prashant	October	285000
5			October Total	730000
6	4	Prashant	November	335000
7	5	Mohit	November	222000
8	6	Raman	November	275650
9			November	832650
10			Grand Total	1562650
11				

Figure 2.14: Result of Subtotal

> **NOTE**
>
> To remove all the subtotals in your worksheet, click on any cell within the range and select **Data** tab > **Subtotal** option. In the dialog box, select the **Remove All** button.

ANALYSING DATA WITH PIVOTTABLE

PivotTable is a powerful tool for consolidating, summarising, and presenting the data. Follow these steps to create PivotTable:

➤ Enter the given data in a new worksheet and select the entire data range.

➤ Choose the **Insert** tab > **PivotTable** option in the **Tables** group.

➤ The **Create PivotTable** dialog box appears.

➤ In the **Table/Range** text box, the range that you have selected for the PivotTable is displayed.

➤ The **New Worksheet** radio button is selected by default.

➤ Click **OK**. The **Create PivotTable** dialog box closes.

	A	B	C	D
1	Name	Department	Designation	Salary
2	Anika	Development	Manager	20000
3	Manas	Production	Prod. Manager	10000
4	Priya	Production	Sr. Prod. Manager	15000
5	Anuradha	Purchase	Manager	10000
6	Ganesh	Sale	Manager	12000
7	Sumita	Sale	Executive	8000
8	Saransh	Sale	Executive	8000
9	Girish	Store	Store Keeper	5000
10	Ramesh	Store	Store Keeper	8000

Figure 2.15: Data for PivotTable

- The PivotTable layout is displayed on the new worksheet. The **PivotTable Fields** task pane appears on the right side of the screen.

- Click and drag the **Name** field and drop it into the **Rows** quadrant as shown in Figure 2.17.

- Drag the **Designation** field into the **Columns** quadrant.

- Drag the **Salary** field into the **Values** quadrant. Your worksheet should look similar to Figure 2.18.

- You can re-arrange the data in any way you like. You can also change the place of buttons here. If you do not like their placement, click the **Undo** button.
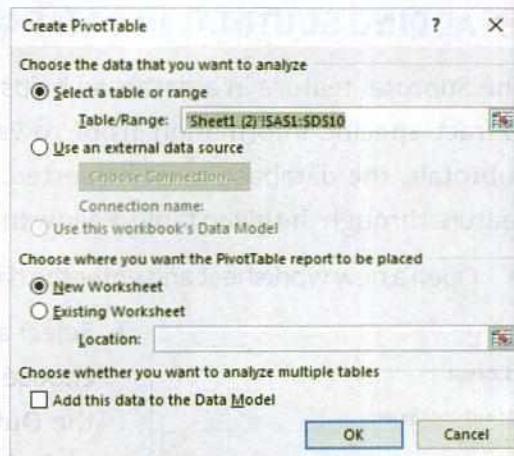
Figure 2.16: Create PivotTable Dialog Box

NOTE

By default, non-numeric fields are added to the **Rows** quadrant, date and time hierarchies are added to the **Columns** quadrant, and numeric fields are added to the **Values** quadrant.
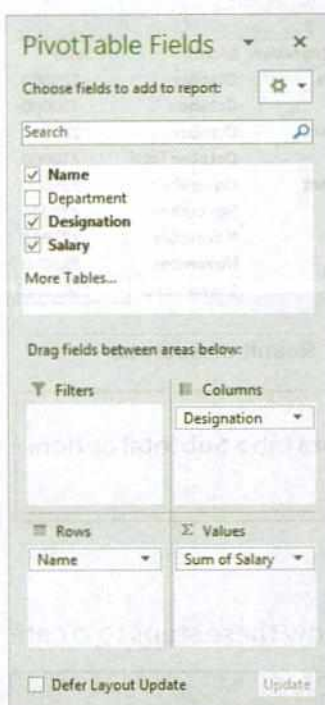
Figure 2.17: PivotTable Fields List
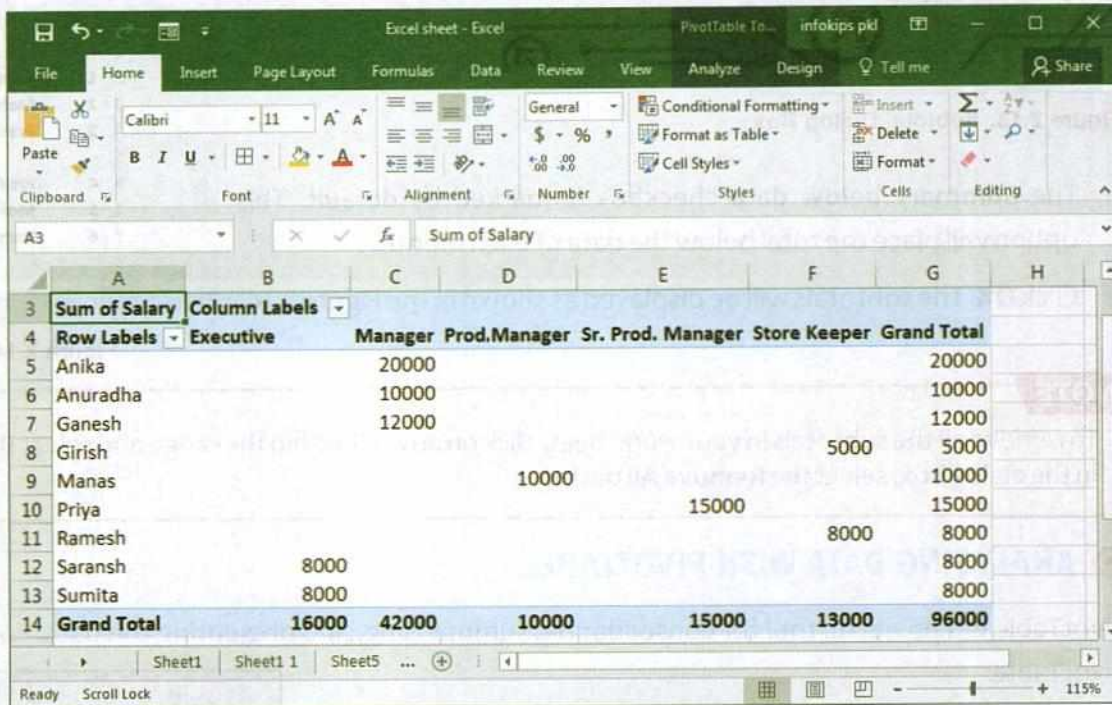
Figure 2.18: PivotTable Layout

Sum of Salary	Column Labels					
Row Labels	Executive	Manager	Prod.Manager	Sr. Prod. Manager	Store Keeper	Grand Total
Anika		20000				20000
Anuradha		10000				10000
Ganesh		12000				12000
Girish					5000	5000
Manas			10000			10000
Priya				15000		15000
Ramesh					8000	8000
Saransh	8000					8000
Sumita	8000					8000
Grand Total	16000	42000	10000	15000	13000	96000

Excel 2013

You can use all the features, like Sorting, Filtering, Validation, PivotTable, etc., in Excel 2013 also in the same way as explained above.

RECAP

➤ A database is a collection of information related to a particular subject.

➤ A column within a database that contains only one type of data is called Field.

➤ A row in a database is called a record, which consists of the information about one person or one object.

➤ Field name is a column label for the field in a database.

➤ A Form is a window or screen that contains numerous fields or spaces to enter, modify, and view one record at a time.

➤ Sorting means arranging the data either in an ascending or descending order.

➤ The Filter feature is one of the interesting features of Excel which helps you to display only those records that meet the specified criteria and hide rest of the records.

➤ Advanced Filter option is used to filter the data in multiple fields using specified criteria, to copy the filtered records to a different location, or to find unique records.

➤ Data Validation is used to restrict the type of data or the values that users' enter into a cell.

➤ The Subtotal feature in a database helps us to manage, analyse, and extract specific information from rows of related data.

➤ PivotTable is a powerful tool for consolidating, summarising, and presenting the data.

BRAIN DEVELOPER

SECTION - A

A. Fill in the blanks.

1. A database helps the user to ...., retrieve, sort and edit data as needed.

2. A .... window or a screen that contains numerous fields or spaces to enter, modify, and view one record at a time.

3. .... is a column label for the field in a database.

4. To restrict the type of data and the values while entering data in a cell, use .... option.

5. To search for a record with specific value, click on the .... button in a form.

6. .... provides an easy way to present the data in a summarised way.

HINTS | • PivotTable   • Organise   • Form   • Field Name   • Criteria   • Data Validation

B. State True or False.

1. Records refer to the rows in the database.

2. Field names can be duplicated in the database.

3. You can sort the data only on one field.

4. Field represents a column in the database.

5. Subtotal values in the database are calculated with Count function.

6. In a database, one cannot rearrange the data as per the need.

7. Conditional Formatting sets a cells format according to the condition that you specify.

C. Application-based questions.

1. Kanika is a Chartered Accountant. She looks after the accounts of various companies and keeps their records in Microsoft Excel. She does not have any idea on how to view only those records that she wants to see. Suggest the feature of Microsoft Excel, using which she can perform this task.

2. Varun is maintaining the marksheet of his class in Microsoft Excel. The teacher has asked him to restrict the marks enteries between 1 and 100 in all the subjects. Which feature of Microsoft Excel should Varun use in order to accomplish the task?

SECTION - B

A. Multiple-choice questions.

1. Which among the following features is used to filter the data in multiple fields using a specified criteria?

   a. Advanced Filter   b. Criteria   c. Sorting

2. Which button under Data tab is used to remove a duplicate value from one or more columns?

   a. Remove   b. Remove Data   c. Remove Duplicates

3. Which feature in a database provides an easy way to enter, modify, and view one record at a time?

   a. Form   b. Adding Subtotal   c. Filter

4. Which feature helps you to display only those records that meet the specified criteria?

   a. Data Validation   b. Sort   c. Filter

5. Which feature allows us to arrange the given data according to a particular field either in an ascending or descending order?

   a. Data Form   b. Filter   c. Sort

B. **Answer the following questions.**

1. Describe the term Database.

   ....

   ....

   ....

2. What is the utility of a Form in a database?

   ....

   ....

   ....

3. What is the use of the Sorting feature in Excel?

   ....

   ....

   ....

4. How is Filter useful?

   ....

   ....

   ....

   ....

5. What is a PivotTable? Describe its utility.

   ....

   ....

   ....

   ....

6. How is Advanced Filter different from Filter?

   ....

   ....

   ....

   ....

7. State the difference between a Field and Record.

   ....

   ....

   ....

ACTIVITY SECTION

Perfection Through Practice

➤ Open Excel 2016 and type the data as given in the worksheet.

➤ Save the worksheet using **Ctrl+S** key combination.

➤ Click on any cell. Click on the **Form** button on the **Quick Access Toolbar**. Select the **New** button.

➤ Type the information - 1011, S. R. Electronics, Retailer, Television, 12, 240000 in the respective fields.

➤ Click on the **Close** button. Record will be saved and displayed at the end of the worksheet.

➤ Click on the **Form** button on the **Quick Access Toolbar**. Now, click on the **Criteria** button. Type 'Television' in **Product** text box. Press the **Enter** key. It will display the record that matches with the criteria.

➤ Click on the **Find Next** button. The next entry related to 'Television' criteria will be displayed. Click on the **Close** button.

	A	B	C	D	E	F
1			**Circuit Mall Sales**			
2						
3	**Invoice No.**	**Customer**	**Type**	**Product**	**Qty**	**Price**
4	1001	R.S. Malik & Co.	Whole saler	Television	35	700000
5	1002	R.S. Malik & Co.	Whole saler	Washing Machine	25	250000
6	1003	Gupta Electronics	Retailer	Mixer	15	127500
7	1004	Ramsons	Retailer	Television	10	200000
8	1005	Ramsons	Retailer	Mixer	15	125000
9	1006	Malhotra Cottage	Retailer	Washing Machine	12	120000
10	1007	Batra Electronics	Whole saler	Washing Machine	50	500000
11	1008	SiaRams Cottage	Retailer	Mixer	10	85000
12	1009	Shine Electronics	Whole saler	Washing Machine	30	300000
13	1010	Shine Electronics	Whole saler	Television	60	1200000

➤ Click any cell. Select **Data > Sort** option. In **Sort by** list box, select 'Customer' field. Select **Z to A** option from **Order** list box. Click **OK** and observe the change.

➤ Click the **Data > Filter** option. Small arrows will be added to each field name.

➤ Click the drop-down arrow of 'Product' field name, and uncheck the **Select All** checkbox to deselect all the options. Now select 'Washing Machine' from the displayed list.

➤ Click **OK**. The list will get filtered and display the records of the product - 'Washing Machine'.

➤ Now remove all filters.

➤ Click on the cell address **A2**. Insert 4 blanks rows.

➤ Select and copy the cells **A7:F7**. Click on the cell **A2** and paste the copied cells.

➤ Type 'Washing Machine' under the 'Product' field name.

➤ Click on any cell in Data range, i.e., from **A7:F8**. Select the **Data** tab and click on the **Advanced** button in the **Sort & Filter** group. Select 'Copy to another location' in **Advanced Filter** dialog box.

➤ Specify the **List range** as $A$7:$F$18, **Criteria range** as $A$2:$F$3 and **Copy to** as $I$7:$N$7. Click **OK**.

- The data matching the criteria will be displayed in the output range.
- Click the **Data > Subtotal** option. Select 'Product' from **At each change** in list box.
- Select 'Sum' from **Use function** list box. Click on the 'Price' check box in the **Add subtotal to** section. Click **OK**. Again select **SubTotal** option and click on **Remove All** button.
- Select any cell, let us say **A10**. Click **Insert > PivotTable** and follow the steps given in the chapter to proceed further.
- Save the file by pressing **Ctrl + S** key combination.

GROUP DISCUSSION — For Concept Clarity

Discuss on the topic: **How is Sorting different from Filtering data?**

PROJECT WORK — Using Creativity

Shikha is a Public Relations Manager in a company. She has prepared a list of her clients along with their birthdays. She now wants to find out the names of persons, whose birthday falls in the month of September. Help her to complete this task using Advanced Filter command.

S.No.	Client's Name	Client's Designation	Date of Birth

ONLINE LINKS — Looking For More

To know more about Microsoft Excel 2016, visit the following websites:
- www.gcflearnfree.org/excel2016/groups-and-subtotals/2/
- www.groovypost.com/howto/create-pivot-tables-microsoft-excel-2016/

ADVANCED FEATURES OF EXCEL

Chart is an effective way to display data in a pictorial form. Charts make it easier to draw comparison and analyse the growth, relationship, and trends among the values in a range. Charts provide more accurate analysis of information.

When you insert a chart, the data is displayed in a special window called **Datasheet**. Chart is updated automatically with the change in data.

COMPONENTS OF A CHART

The various components of a chart are shown in Figure 3.1.

1. **CHART AREA :** The chart area includes all objects and elements in a chart.

2. **CATEGORY AXIS:** Category axis or X-axis is the horizontal axis of a chart.

3. **VALUE AXIS:** Value axis or Y-axis is the vertical axis used to plot the values.

4. **DATA SERIES:** A data series is a related set of data values.

5. **AXIS TITLES:** These are the headings given to X-axis and Y-axis. The titles help in understanding what is being depicted on the axes.

6. **PLOT AREA:** The plot area is a window within a Chart area. It contains the actual chart and includes the plotted data, data series, category, and value axis.

7. **LEGEND:** It depicts the colours, patterns, and symbols assigned to a data series.

8. **CHART TITLE:** It describes the aim and contents of the chart.

Figure 3.1: Components of a Chart

9. **GRIDLINES:** These can either be horizontal or vertical lines depending on the selected chart type. They extend across the plot area of the chart. Gridlines make it easier to read and understand the values.

COMMONLY USED CHART TYPES

Different types of charts are available in Excel. Some of the most commonly used charts are:

Column Chart	**COLUMN:** A column chart is a commonly used chart type to display data in the form of vertical bars. It is used to show changes in data over a period of time or comparisons among different data items. In a Column chart, categories are represented on the horizontal axis and values along the vertical axis.
Bar Chart	**BAR:** This chart displays data in the form of long rectangular rods, also called bars, that are placed vertically or horizontally in the Chart area. A bar chart illustrates comparisons amongst the individual items. In this type of chart, categories are represented on the vertical axis and values are represented on the horizontal axis.
Line Chart	**LINE:** This chart is in the form of lines. It is very similar to plotting a graph on a graph paper with its values on the X and Y-axis. A line chart uses connecting dots to display trends in data over a period of time.
Pie Chart	**PIE:** It is a circular chart divided into sectors where each sector shows the relative size of each value. It always shows only one data series and is useful when you want to emphasise on a significant element.
Doughnut	**DOUGHNUT:** This chart shows the relationship of part to a whole. It displays data in the form of rings where each ring represents a data series added into the chart. Unlike a Pie chart, Doughnut chart represents more than one data series.

CREATING A CHART

It is quite simple to create a chart in Excel. Follow these steps to create a chart:

> ➤ Create a new worksheet with the data as shown in Figure 3.2.

> ➤ Select the range (A2:B7) including column headings and row labels to be displayed in the chart.

> ➤ Click on the **Insert** tab. In the **Charts** group, select the Column drop-down menu.

> ➤ Click on **Clustered Column** in the drop-down list. The chart gets displayed in the center of the worksheet.

> ➤ The two tabs named as **Design** and **Format** appear under the **Chart Tools** category on the Ribbon. These tabs contain options for editing and formatting the chart.

	A	B
1		
2	**Name**	**Marks**
3	Kabir	86
4	Rajan	78
5	Ridhima	95
6	Anika	89
7	Vijay	98

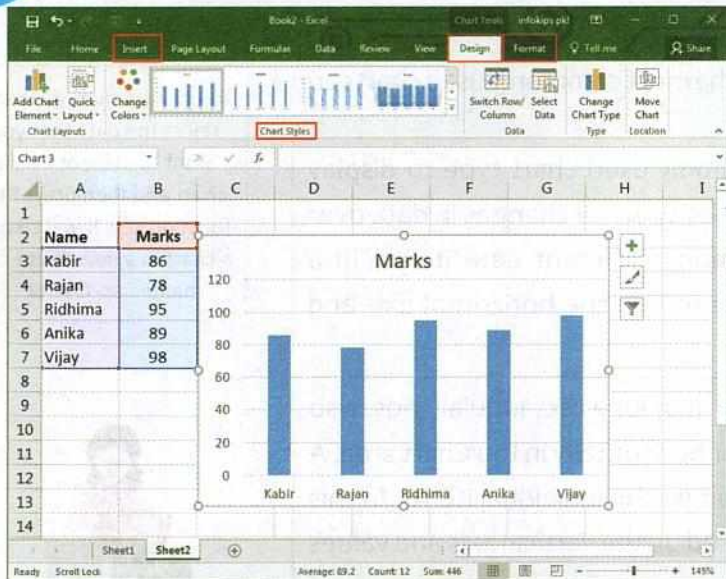**Figure 3.2: Selecting Range for a Chart**
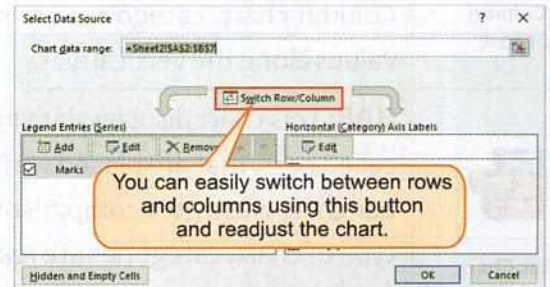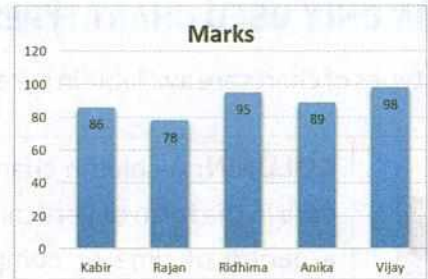
Figure 3.3: Creating a Chart

Figure 3.4: Select Data Source Dialog Box

➤ Click on the **Design** tab. In the **Chart Styles** group, click on the **More** button ⩢ to view all the available styles. Place the mouse pointer on each style to preview its effect. Click on the desired style that you want to use and observe the change. All the titles, data labels, legend details mentioned in the selected data range will be displayed in the chart.

➤ To change the data range of your chart, right-click on the chart and click on the **Select Data** option from the Shortcut menu. The **Select Data Source** dialog box appears. Click **OK** after making the desired changes.

CHART ELEMENTS

You can add Axis Title, Data Series, Chart Title, Legend, Gridlines, and any other component of the chart whenever required.

ADDING A CHART TITLE

Click on the chart and follow the given steps:

➤ Click on the **Add Chart Element** in the **Chart Layouts** group on the **Design** tab.

➤ A list of options appears. Click on the **Chart Title** option and select either the **Above Chart** or **Centered Overlay** option.

➤ A **Chart Title** text box appears. Type the text in it. After typing the title, click outside the chart.

ADDING AXIS TITLE

➤ Go to the **Design** tab.

➤ Select the **Axis Titles** option from the **Add Chart Element** button in the **Chart Layouts** group.

➤ Select **Primary Horizontal** option to add title for an X-axis.

➤ The **Axis Title** box appears at the bottom. Type the text in it and then click outside the chart.

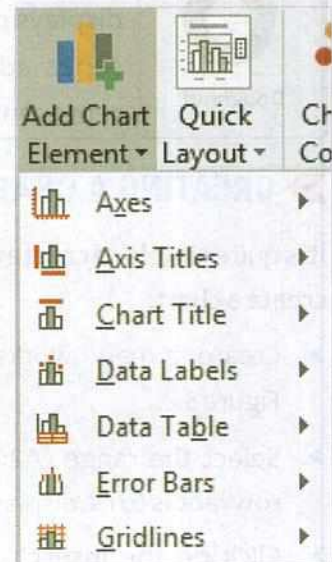Likewise, you can add Y-axis by selecting the **Primary Vertical** option.

Figure 3.5: Various Chart Elements

ADDING DATA LABELS

➤ Click on the **Add Chart Elements** button in the **Chart Layouts** group.

➤ Click on the **Data Labels** option from the drop-down menu. Choose any option from the displayed list.

ADDING DATA TABLE

➤ Click on the **Add Chart Elements** button in the **Chart Layouts** group.

➤ Click on the **Data Table** option from the drop-down menu. Choose the desired option from the displayed list.

ADDING LEGEND

Legend is a box that identifies the patterns or colours assigned to a data series in a chart. It helps in reading the chart accurately. By default Legends appear at the bottom of the chart. You can place them anywhere as per your choice.

➤ Click on the **Add Chart Elements** button in **Chart Layouts** group.

➤ Click on the **Legend** option from the drop-down menu and choose any desired option from the displayed list.

ADDING GRIDLINES

➤ Click on the **Add Chart Elements** button in **Chart Layouts** group.

➤ Click on the **Gridlines** option from the drop-down menu and select any desired option.

> You can also add, remove or change chart elements by clicking on the **Chart Elements** button ➕, which appears at the upper right corner of the chart.

➢ FORMATTING A CHART

Formatting improves the appearance of a chart. We can format a chart by adding title, changing text, font, line colour, width, border style, legends, data series, and so on. We can also change the numbers on the value axis, hide or show gridlines, etc.

CHANGING BACKGROUNDS, COLOURS, AND PATTERNS

We can modify a chart by changing its colour, pattern, and background.

➤ Right-click on the **Plot Area** and select the **Format Plot Area** option. The **Format Plot Area** task pane will appear on the right side.

➤ Click on the **Fill** tab and select the **Solid fill** radio button.

➤ Select the **Color** button and choose the desired colour from the **Fill Color** drop-down menu. Observe the change in the colour of the Plot Area.

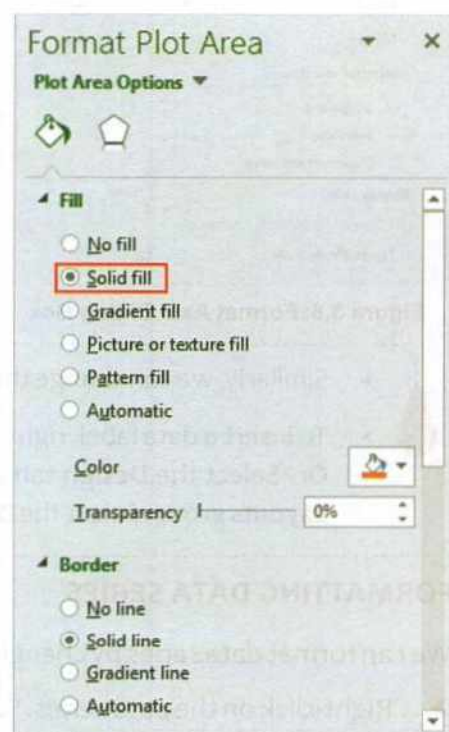➤ Click on the **Border** tab. Select the **Solid line** option and increase the width. Observe the change.

Figure 3.6: Format Plot Area Dialog Box

NOTE

Similarly, you can change the background of **Chart Area** by clicking on the **Format Chart Area** option.

FORMATTING THE LEGEND

➤ We can format text, background, boundary, and colour of a legend. Right-click on the **Legend** boundary and select the **Format Legend** option or simply double-click on the Legend.

➤ The **Format Legend** task pane appears on the right side.

➤ Select the **Fill & Line** tab and then select the **Border** option. Click on the **Dash type** drop-down list and select any style.

➤ Specify the **Width** by clicking the spin arrows.

➤ Select the desired colour by clicking on the **Color** drop-down menu.

➤ To position the legend on the chart, select the **Legend Options** tab and select the **Top** radio button from the displayed list.

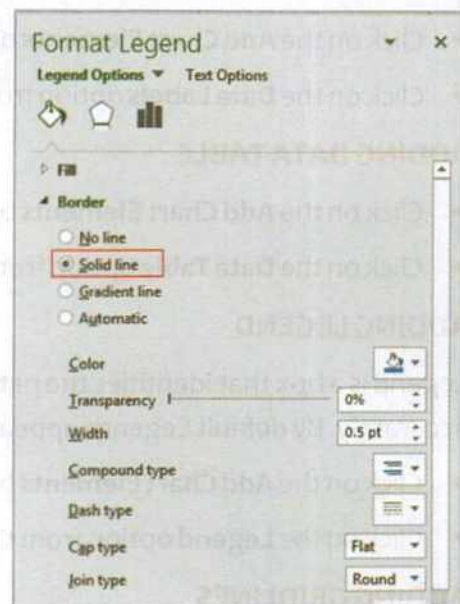➤ Click on the **Close** button. The legend will be placed at the top of the chart.
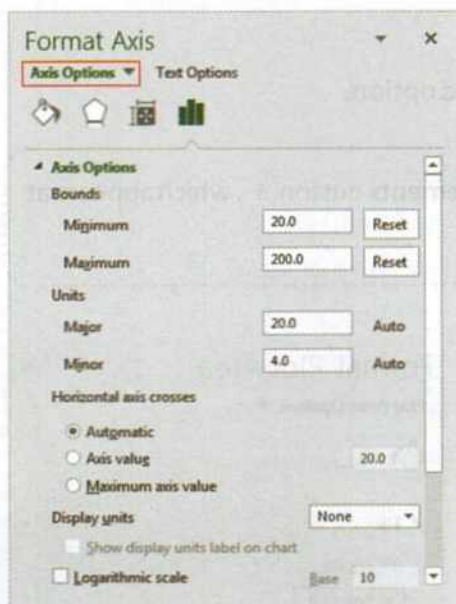
Figure 3.7: Format Legend Dialog Box

CHANGING THE SCALE OF VALUE AXIS

A chart consists of two axes – horizontal axis (X-axis) and vertical axis (Y-axis). Most chart types have two axis. By default, Excel automatically determines the values on the vertical axis. To change these values, follow the given steps:

➤ Point the mouse at Y-axis. Right-click on it and select the **Format Axis** option from the Shortcut menu.

➤ The **Format Axis** task pane appears on the right side. Select the **Axis Options** tab. Click the **Minimum** text box and enter 20 in it.

➤ Similarly, enter 200 in the **Maximum** text box. Click on the **Close** button and observe the change.

Figure 3.8: Format Axis Dialog Box

> ➤ Similarly, we can change the scale for X-axis.
> ➤ To insert a data label, right-click on the **Data Series** and choose **Add Data Labels** ➕ from the Shortcut menu. Or Select the **Design** tab and click on the drop-down arrow of the **Add Chart Element** option in the **Chart Layouts** group. Select the **Data Labels** option from the list that appears.

FORMATTING DATA SERIES

We can format data series by changing the bar colours, lines, slices, and shifting its position. Let us do it practically:

➤ Right-click on the data series. Select the **Format Data Series** option from the Shortcut menu.

➤ The **Format Data Series** task pane will appear on the right side.

➤ Click on **Fill & Line**. Change the border type and its width by selecting the **Dash type** and **Width** options respectively.

- Click on the **Fill** tab and choose the **Picture or Texture fill** radio button.

- Click on the **Texture** drop-down button and select any texture from the displayed choices.

- Click on the **Effects tab** and select the **Shadow** option. Select the desired format from the **Presets** drop-down menu.

- Click on the **Close** button ✕.

Figure 3.9: Format Data Series Dialog Box

COMBO CHART

A Combo chart is a combination of two or more chart types in a single chart. Using this feature you can plot two or more set of values to show multiple types of data. To create a combo chart:

- Enter the data as shown in Figure 3.10.

- Go to **Insert** tab and select **Insert Combo Chart** drop-down menu from the **Charts** group.

- Select **Create Custom Combo Chart**. The **Insert Chart** dialog box appears.

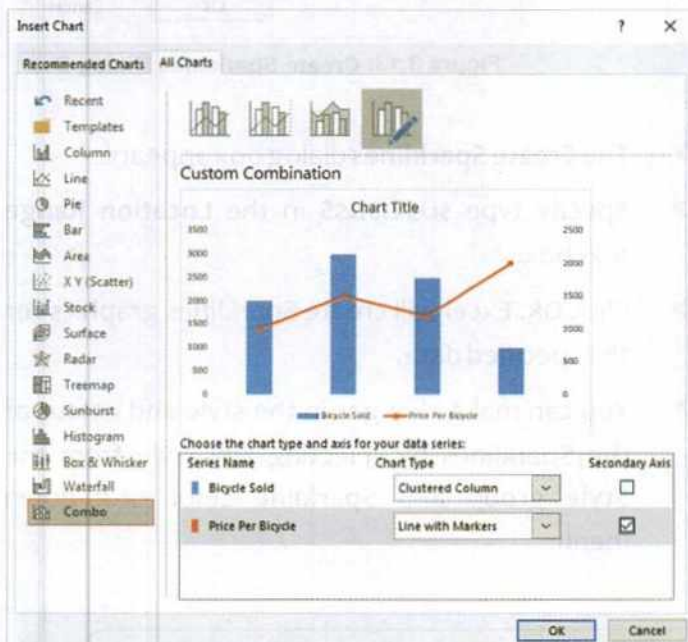|	A	B	C
1	Model	Bicycle Sold	Price Per Bicycle
2	Classic	2000	1000
3	Gear	3000	1500
4	Hiking	2500	1200
5	Advanced	1000	2000

Figure 3.10: Data Shown in a Table

Figure 3.11: Insert Chart Dialog Box

- Select **Clustered Column** as the chart type for Bicycle sales and **Line** chart for the Price Per Bicycle column.

- Click on the **Secondary Axis** check box.

- Now click **OK** to insert the chart.

- Give appropriate titles to the chart and the axes by clicking on the **Chart Elements** button.

Figure 3.12: Displaying the Combo Chart

SPARKLINES

Sparklines are mini charts that fit into a single worksheet cell to provide the visual representation of the data. These can be used to analyse the trends in your data. Once the Sparklines are added, further options can be accessed through the **Sparklines** tab. There are 3 types of sparklines – Line, Column, and Win/Loss.

Line represents the relative value of the selected worksheet data.

Column where the selected worksheet data is represented by tiny columns.

Win/Loss where the selected worksheet data appears as a win/loss chart. Wins are represented by blue squares that appear above red squares.

Follow the below given steps to add sparklines to your data.

➤ Select the data without selecting the column headings. Let us say **A2:C5**.

➤ Go to **Insert** tab, select the **Line** 📉 option from the **Sparklines** group.

Figure 3.13: Create Sparklines Dialog Box

➤ The **Create Sparklines** dialog box appears.

➤ Specify type **$D$2:$D$5** in the **Location Range** text box.

➤ Click **Ok**. Excel will create Sparklines graphics for the specified data.

➤ You can make changes in the style and colour of the Sparklines by selecting any style from the **Style** group and **Sparkline** color drop-down menu.

Figure 3.14: Sparklines are Created

Excel 2013

In Excel 2013, you can add, delete and format the chart and its elements in the same way as you do in Excel 2016.

USING GOAL SEEK

Goal Seek is a wonderful feature that helps in determining input values needed to achieve a specific goal. It calculates a value by performing **What-if Analysis** on a given set of values. Let us understand it with the help of an example.

> Enter data in a worksheet. Calculate total and percentage as shown in Figure 3.15.

Let's Know More

To edit the contents of more than one sheet at a time, hold down **Ctrl** key while clicking the tabs of the sheets you want to edit and then modify the data.

Figure 3.15: Using Goal Seek

Know the Fact

In Microsoft Excel 2016, a file is saved with an extension **.xlsx**.

> Select the **Data** tab, click on the **What-If Analysis** button in the **Forecast** group and then select Goal Seek option. The **Goal Seek** dialog box will appear on the screen.

> In the **Set cell** text box, define the cell address E5, on which the goal seek is to be applied. In this box, always refer the cell that contains the formula.

> Type the new value 150 in **To value** text box. This box contains the target or goal value to be attained. Press the Tab key.

Figure 3.16: Goal Seek Dialog Box

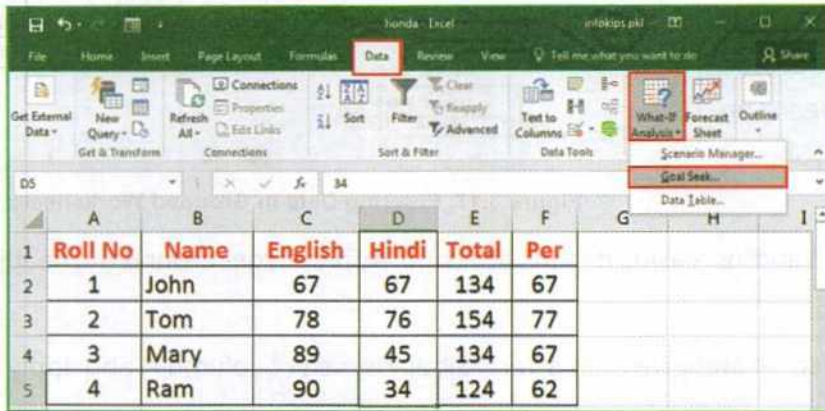> Click on the cell **D5** in the worksheet. The address will appear in the **By changing cell** text box. This value points to the input value you want to adjust. Click on **OK** button.

> The **Goal Seek Status** dialog box appears on the screen displaying the solution. Click **OK** to close the dialog box.

> Observe the changes in the worksheet. The percentage (Per) also gets changed accordingly.

Excel 2013

In Excel 2013 also, you can find the goal seek option on the **DATA** tab.

GROUPING WORKSHEETS

Grouping worksheets facilitates in editing multiple worksheets at the same time. You can enter common data, formatting effects, and formulas in the grouped sheets. Follow

Let's Know More

> To delete the grouped sheets, right-click on any grouped Sheet tab and click on the **Delete** option from the Shortcut menu.
> Note that you cannot delete all the sheets in a workbook. At least one sheet must exist in the workbook.

these steps to group multiple worksheets:

➤ Create a new workbook. Add two more sheets in the workbook. Select **Sheet1** tab.

➤ Press and hold the **Shift** key and click on the **Sheet3** tab.

➤ Release the **Shift** key. Currently **Sheet1** is active. Enter the data in the sheet. Note that all the three worksheet tabs have become white and the word '[Group]' appears on the Title bar. It indicates that Sheet1, Sheet2 and Sheet3 are grouped together.

Figure 3.17: Entering Data in Grouped Worksheets

➤ Format the heading by making it bold and increasing its font size to 18. Apply border around the heading 'FIRST QUARTER SALES 2019'.

➤ Select row 3, increase the font size to 14 and give bold effect. Similarly, select column A and apply the same formatting effects.

➤ To ungroup the worksheets, click on any **Sheet** tab other than the grouped ones or right - click on any grouped **Sheet** tab and select **Ungroup Sheets** option.

➤ All the three sheets will display the common data with formatting effects.

➤ Save the worksheet.

NOTE

If you have entered data in Sheet1 before grouping the worksheets, that data will not be reflected in other sheets.

⟫ CONSOLIDATING DATA

Consolidation helps in combining the data of multiple worksheets. We can combine data of various ranges either in the same sheet or in different sheets. We will consider the same example (as given under 'Grouping worksheet' section) for explaining this feature.

➤ To consolidate data in different sheets, it is essential to group them together.

Figure 3.18: Data Entered in Sheet1

Figure 3.19: Data Entered in Sheet2

➤ Consider the example given under 'Grouping worksheet' section and follow the steps to group the sheets.

➤ After grouping and entering the common data in 3 worksheets, click on the **Sheet3** tab, change the heading as shown in Figure 3.21 and select the cell B5.

➤ Select the **Data** tab > **Consolidate** option in the **Data Tools** group. The **Consolidate** dialog box appears.

➤ To calculate the total car sales in the First Quarter of 2018 and 2019, select the **Sum** function from the list box, if it is not selected.

➤ Click on the **Reference:** text box. Click on the **Sheet1** tab and select the cell range from B5:D10.

➤ Click on the **Add** button. The cell reference will be added in **All references:** text box.

➤ Click on the **Reference:** text box once again.

➤ Now click on the **Sheet2** tab. Select the cell range B5:D10.

Flash Fill	Consolidate
Text to Columns	Remove Duplicates	Relationships
	Data Validation ▾	Manage Data Model

Data Tools

Consolidate ? ✕

Function:

Sum ▾

Reference:

Sheet2!$B$5:$D$10   🔢   Browse...

All references:

Sheet1!$B$5:$D$10   Add

Sheet2!$B$5:$D$10   Delete

Use labels in

☐ Top row

☐ Left column   ☐ Create links to source data

OK   Close
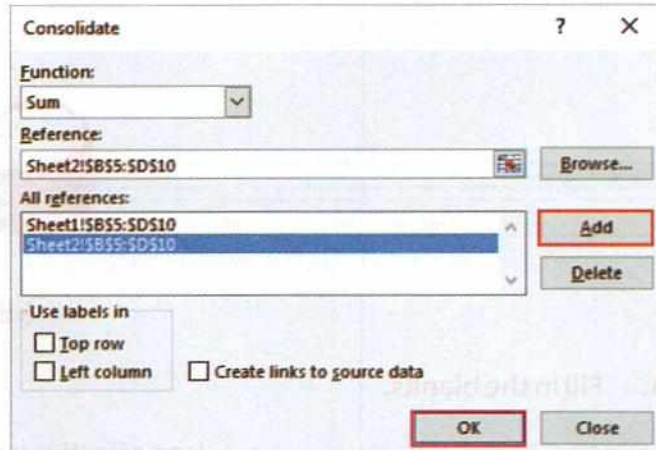
Figure 3.20: Consolidate Dialog box

	A	B	C	D	E
1	CONSOLIDATING FIRST QUARTER SALES (2017-2018)				
2					
3		JAN	FEB	MAR	
4					
5	HONDA CITY	1350	2400	2900	
6	XCENT	700	1600	5600	
7	TIAGO	2500	2200	6700	
8	WARGON-R	10000	10500	10000	
9	SANTRO	1300	1400	2800	
10	ALTO	600	320	4200	

Sheet1   Sheet2   **Sheet3**   ⊕

Ready   115%

Figure 3.21: Data Consolidation in Sheet3

➤ Click on the **Add** button. Now click on **OK** button in the **Consolidate** dialog box.

➤ **Sheet3** will display the consolidated data of first quarter sales of each car in the year 2017 and 2018.

➤ Save the file.

Excel 2013

You can group the sheets in Excel 2013 in the same way as explained above.

RECAP

➤ Charts make it easier to draw comparisons, analyse growth, and relationship among the values.

➤ We can change the chart type by clicking the Change Chart Type button on the Design tab.

➤ The Chart Area includes all objects and elements in a chart.

➤ The Plot area is a window within a Chart Area, which contains the actual chart and includes the plotted data, data series, category, and value axis.

- A Data series is a related set of data values.
- Legend is a key that is used to identify the colours, patterns, or symbols assigned to a data series.
- Grouping worksheets facilitate in editing multiple worksheets at the same time.
- Goal Seek is a wonderful feature which helps in determining input values needed to achieve a specific goal.
- Consolidation helps in combining the data of multiple worksheets. We can combine the data of various ranges either in the same sheet or in different sheets.

BRAIN DEVELOPER

SECTION - A

A. Fill in the blanks.

1. A .... is an effective way to display data in pictorial form.

2. .... is a related set of data values.

3. .... is a key that is used to identify the colours, patterns, or symbols assigned to data series.

4. A .... chart displays data in the form of long rectangular rods.

5. .... is the vertical axis that is used to plot the values.

6. The purpose of grouping worksheets is to enter common ...., ..., and ....

HINTS
- Bar
- Data
- Chart
- Formulas
- Data Series
- Value Axis
- Legend
- Formatting effects

B. State True or False.

1. A chart is updated automatically with the change in data.

2. We cannot modify the chart by changing its colours and patterns.

3. X-axis is the horizontal axis.

4. The Chart area contains the actual chart itself and includes data series, category, and value axis as well.

5. You can change the pattern of the data series using Fill option.

6. All the worksheets cannot be deleted in a workbook.

C. Application-based questions.

1. Ritu is a student of class VII. Her geography teacher has asked her to prepare a chart on the population of four Metro cities of India. Suggest the chart type that suits her project.

....

2. Tripti has created a chart. She wants to improve the appearance of her chart by changing the background colour of its Plot area. Which option will you suggest her to do so?

....

SECTION - B

A. Multiple-choice questions.

1. Which feature is used to determine the input values needed to achieve a specific goal?

   a. Grouping Worksheets   b. Legends   c. Goal Seek

2. What are the headings given to X-axis and Y-axis known as?

   a. Data Series   b. Axes Titles   c. Legends

3. Which chart type displays data in the form of a circle?

   a. Line   b. Pie   c. Bar

4. Which function key is used to insert a chart instantly in a worksheet?

   a. F6   b. F8   c. F11

5. Which key is used to group multiple worksheets?

   a. Shift   b. Ctrl   c. Enter

6. The mini charts that fit into a single worksheet cell to provide the visual representation of the data are known as ....

   a. Mini Charts   b. Combo Charts   c. Sparklines

B. Answer the following questions.

1. What is a Chart?

....

....

2. How is a Column chart different from a Bar chart?

....

....

3. What is the difference between Chart area and Plot area?

....

....

4. What is the utility of grouping the worksheets of a workbook?

....

....

5. What is Data Consolidation?

....

....

ACTIVITY SECTION

LAB SESSION   Perfection Through Practice

> Open a new workbook. Add 2 more sheets in it. Select **Sheet3** tab. Sheet3 is now active.

> Press and hold the Shift key and click on the **Sheet1** tab. Release the Shift key. Now all the three sheets are grouped.

> Enter the common data in the grouped worksheets as given in Figure 1.

> Format the heading. Increase the font size to 16, make it bold and apply border to it.

> Select the range **A4:B14** and apply bold effect to it.

> Right-click on any grouped Sheet tab and choose **Ungroup Sheets** option from the Shortcut menu.

F18				×	✓	fx		
	A	B	C	D	E	F	G	
1		Students Performance Report						
2								
3	ROLL NO	NAME	HINDI	ENGLISH	COMPUTER	HISTORY		
4	101	AJAY						
5	102	VIJAY						
6	103	JAYA						
7	104	DIPTI						
8	105	SARIKA						
9	106	SIMRAN						
10	107	KIRAN						
11	108	JOY						
12	109	TOM						
13	110	GANESH						
14	111	REMESH						

Sheet1 Sheet2 Sh ... ⊕
Ready   100%

Figure 1

> Click on the **Sheet1** tab and enter the data as shown in Figure 2.

> Click on the **Sheet2** tab and enter the data as shown in Figure 3.

> Click on the **Sheet3** tab and select cell **C4**. Click on the **Data** tab > **Consolidate** option. Select **Sum** function from the list. Click the **Collapse** button in the **Reference** text box.

> Click on the **Sheet1** tab and select the range **C4 : F14**. Now click on the **Add** button in the **Consolidate** dialog

	A	B	C	D	E	F
1		Students Performance Report				
2						
3	ROLL NO	NAME	HINDI	ENGLISH	COMPUTER	HISTORY
4	101	AJAY	58	78	89	45
5	102	VIJAY	78	67	78	56
6	103	JAYA	76	56	78	54
7	104	DIPTI	78	45	56	34
8	105	SARIKA	98	56	76	65
9	106	SIMRAN	67	76	87	54
10	107	KIRAN	86	76	87	65
11	108	JOY	65	34	87	45
12	109	TOM	54	56	66	58
13	110	GANESH	75	67	54	76
14	111	REMESH	86	54	78	65

Sheet1 | Sheet2 | Sheet3 ... ⊕

Select destination and press ENTER or choose ... 115%

Figure 2

➤ Sheet3 will show the total marks of all the students in each subject.

➤ Create a **Column** chart by clicking on the **Insert** tab and add the title – 'Students Performance Report'.

➤ Now format the chart as per your requirement. Save the file using **Ctrl + S** key combination.

box. The cell reference will be added in **All references** list box.

➤ Select the **Collapse** button of **Reference** text box again. Click on the **Sheet2** tab. Select the cell range **C4:F14**. Click on the **Add** button and then click on the **OK** button in the **Consolidate** dialog box.

	A	B	C	D	E	F
1		Students Performance Report				
2						
3	ROLL NO	NAME	HINDI	ENGLISH	COMPUTER	HISTORY
4	101	AJAY	60	55	90	65
5	102	VIJAY	43	67	82	87
6	103	JAYA	45	67	85	65
7	104	DIPTI	74	89	67	76
8	105	SARIKA	73	77	75	89
9	106	SIMRAN	80	67	90	67
10	107	KIRAN	89	64	78	78
11	108	JOY	56	87	78	56
12	109	TOM	67	74	89	65
13	110	GANESH	77	72	90	87
14	111	REMESH	76	45	53	98

Sheet1 | **Sheet2** | Sheet3 ... ⊕

Select destination and press ENTER or choose ... 115%

Figure 3

PROJECT WORK   Using Creativity

Shruti is a dance teacher. She teaches various forms of dances in her class which are Classical, Hip Hop, Contemporary and Salsa. She has created a worksheet in Microsoft Excel, maintaining details of the students' fees for various forms of dances. She wants to create a Column chart with proper formatting effects for the given data. Help her to perform the task.

Dance Class		
Dance Form	No. of Students	Fees Per Student
Classical	25	500
Hip Hop	15	1000
Contemporary	20	1500
Salsa	40	2000

ONLINE LINKS   Looking For More

To know more about the new features of Microsoft Excel 2016, visit the following websites:

➤ www.gcflearnfree.org/excel2016/whatif-analysis/1/

➤ www.gcflearnfree.org/excel2016/charts/1/

LOG ON TO ANIMATE CC

WHAT IS ANIMATE?

Animate is a powerful animation software package developed by Adobe Systems (formerly Macromedia). Animate provides a versatile and easy way to create animation that consists of images, sounds, and videos with various effects. Animate is a vector based program, which means that the graphics created in it can be scaled to any size without compromising the quality. Animate is extremely useful for developing highly interactive websites, online advertisements, computer games, and contents for various mobile devices. Playing movies in any browser is one of the best features of Animate.

TO OPEN ANIMATE

➤ Click on the **Start** > scroll down to **Adobe Animate CC**.

➤ The opening screen appears.

➤ Click on the **ActionScript 3.0** under **Create New** section to open the Animate document.

Figure 4.1: The Opening Screen of Animate

THE WORKSPACE

Animate is similar to the Paint software in Windows. It has almost the same tools that Paint uses, except that these tools are mainly used for animation.

The 'Workspace' is the arrangement of various Animate elements, such as the Tools panel, Library panel, Property inspector, and Stage.

STAGE

The Stage is a drawing board where we can create graphics, animation, and can make modifications too. It is a large white space that is present at the center of the workspace. By default, the Stage dimensions are 550 x 400 pixels. The grey area
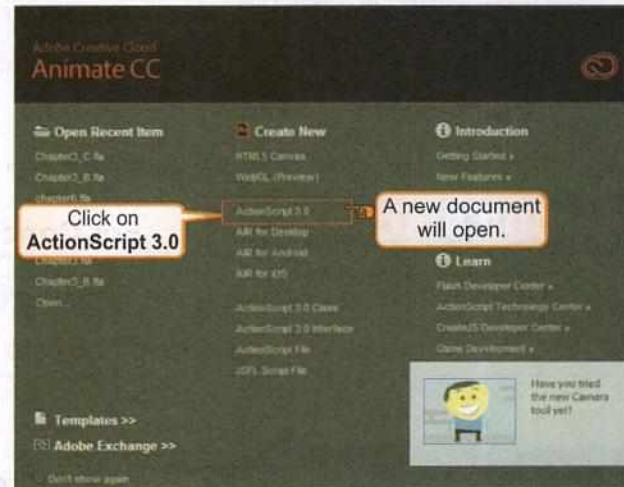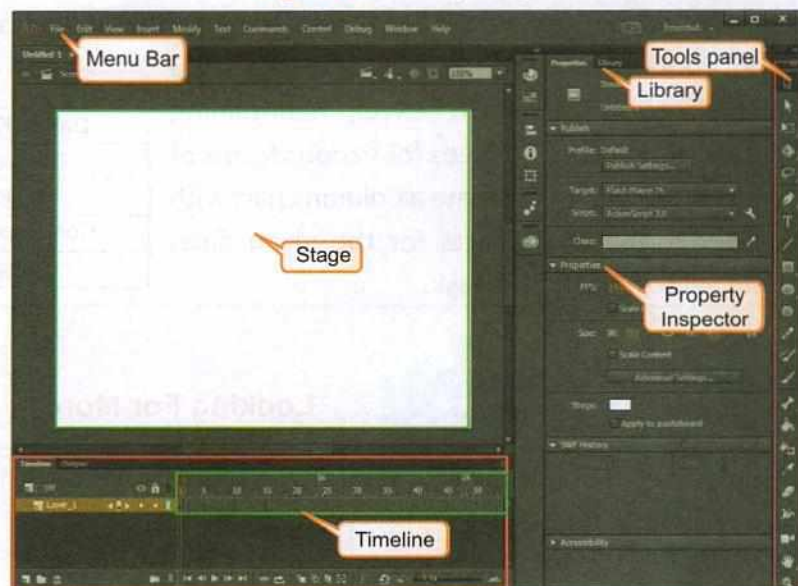

Figure 4.2: Animate Workspace

Figure 4.3: Tools Panel

surrounding the Stage is called the **Work Area**. This area can contain graphic elements which can be moved to the stage as and when required. We can modify the view of the stage size by selecting the **View > Zoom In** and **View > Zoom Out** options as well.

MENU

The **Menu** provides control over common functions like opening, closing, and saving of a document. Some other features like copying, pasting, calling up specific panels, and controlling overall Animate environment can be seen under Menu options.

TOOLS PANEL

The Tools panel consists of various tools to draw, paint, select, and modify objects in the workspace. The Tools panel is divided into four parts – **Tools, View, Colors,** and **Options**.

Tools Section: It contains tools that are used for drawing, painting, and selecting objects.

View Section: It consists of tools for zooming and panning the application window.

Colors Section: It includes modifiers to select colours for the shape you draw, using **Stroke** and **Fill Color** picker.

Options Section: It displays modifiers for the currently selected tools. Modifiers affect the tool's painting or editing operations.

TIMELINE

The Timeline is a rectangular window that is present at the bottom of the Stage. It is the area where one controls the sequencing and timing of graphics and other elements of a movie. The major component of the Timeline are Layers, Frames, and the Playhead.
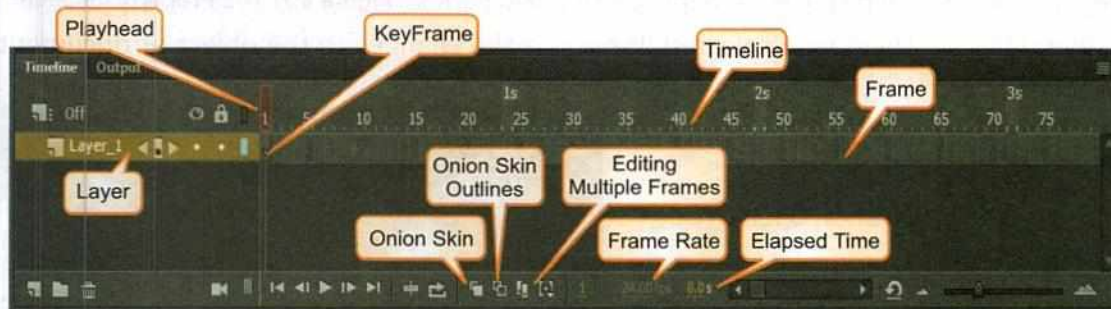

Figure 4.4: The Timeline

FRAMES

Animations in Animate are created with the help of frames. **Frame** is defined as the little rectangular cells that appear on the Timeline. Every fifth frame displays a number, which we can find on the top of the Timeline. Like films, the Animate document divides the

length of time into frames. A frame displays the content of the movie at a specific moment of time.

KEYFRAMES

Keyframes are special types of frames, where we define some change to an object's properties for an animation like position, colour, shape, etc. A keyframe is represented by a solid black dot. We can easily change the length of a tweened animation by dragging a keyframe in the Timeline.

Figure 4.5: Two Types of Keyframes

LAYERS

Layers are like transparent sheets stacked on top of one another, each containing a different image that appears on the Stage.

When we open a new Animate document, it displays only one layer which contains its own timeline with endless frames. We can add more layers to organise the artwork and animation in a document. We can draw and edit objects on one layer without affecting objects on another layer. The active layer is indicated with a **Keyframe Navigation Controller** icon.
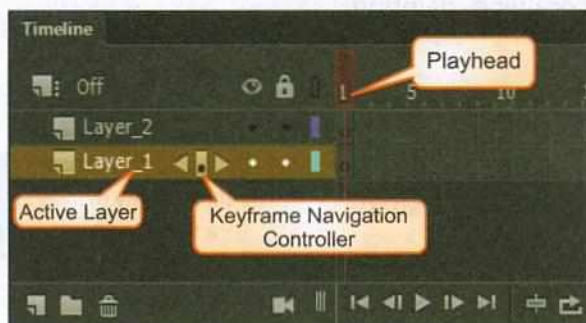
Figure 4.6: The Playhead

PLAYHEAD

The **Playhead** indicates the current frame displayed on the Stage. It is represented by a red frame and a red vertical line below it in the Timeline window. It moves from left to right on the Timeline as the movie proceeds through the frames. The speed of the playheads movement is based on the frame rate setting.

Figure 4.7: The Property Inspector

PROPERTY INSPECTOR

The **Property Inspector** is a panel that displays the properties of the selected object (text, symbol, an image, a line, or a shape). The list of properties also varies in the **Property Inspector** depending on the object selected. We can make changes to the object or document attributes in the **Property Inspector**.

⯈ SETTING DOCUMENT PROPERTIES

Each time when we open Animate, the application opens a new file with the default settings for the movie properties. We can create a new movie as we want. To set the frame rate, background, colour, and ruler units, we use the following steps:

> Click on **File > New**. The **New Document** dialog box is displayed.

> Select the **ActionScript 3.0** option in the **Type** section. Define the Stage dimensions, Ruler units, Background colour, and
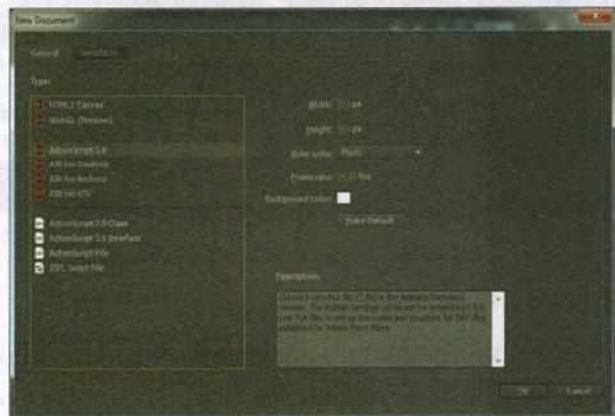
Figure 4.8: New Document Dialog Box

Frame rate, and click on **OK**.

➤ A document will open with the defined settings.

CHANGING THE SETTINGS OF AN ALREADY OPENED DOCUMENT

➤ You can also modify the settings of already opened document later on by selecting the **Modify > Document** option and change the settings as per your need.

➤ To specify the Stage size in pixels, select the **Pixels** from the **Units** drop-down list. Enter the values of width and height in their corresponding boxes in the Stage size section.

➤ To set the Stage size according to the contents on the stage, select the **Match contents** option next to the **Stage size** section.

➤ To set the background colour of the stage, choose any colour from the **Stage color** swatch.
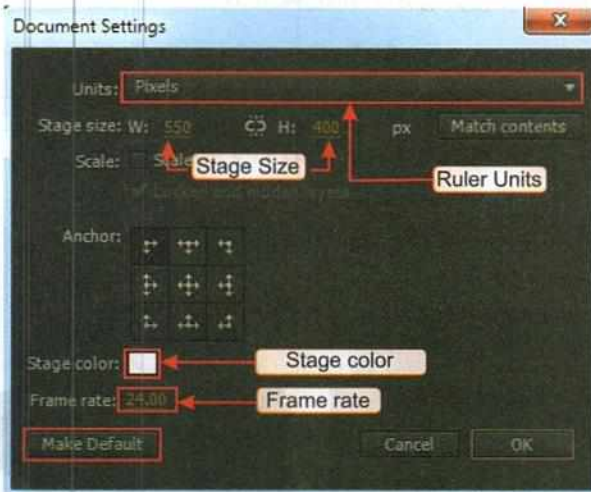
Figure 4.9: Document Settings Dialog Box

➤ To change the frame rate, specify the speed at which an animation is to be played in frames per second in the **Frame rate** box. By default, the frame rate is 24 fps (frame per second). Type any number between 0.01 to 120 fps in the **Frame rate** box.

➤ To save the current settings as the default, click on the **Make Default** button.

➤ Click on **OK** after specifying the required options.

◆ DRAWING AN OBJECT AND GROUPING OUTLINE WITH FILL

When we make a drawing in Animate, it actually creates two objects – the **fill** and the **outline**. To manipulate elements as a single object, we need to group them.

➤ Select the **Pencil Tool** and select brown as the **Stroke Color**. Draw the trunk as shown in Figure 4.10.
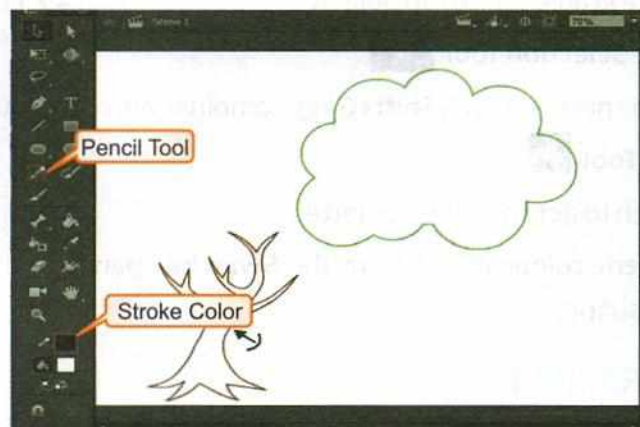
Figure 4.10: Drawing Tree

> Choose the **Selection Tool** 🔲 and move the pointer on the tree trunk. A curve is displayed below the arrow. Hold-down the left mouse button and drag the lines of the trunk to give a proper shape.

> Select the **Pencil Tool** 🖊 and choose the **Smooth** mode from the **Pencil Mode** option.

> Select green colour as the **Stroke Color**. Draw the curves of the tree top as shown in Figure 4.10.
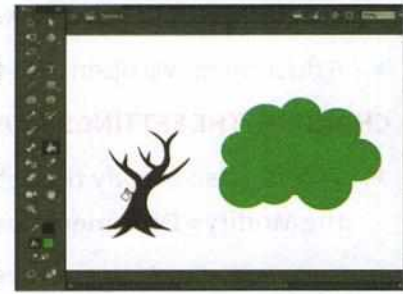

Figure 4.11: Filling Colour in the Object
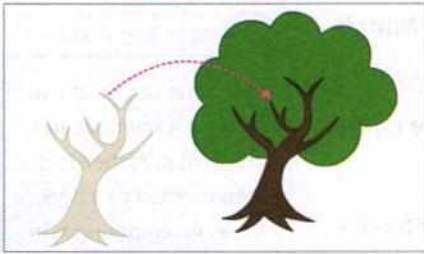

Dragging the Tree Top

Figure 4.12: Dragging the Object

> Select green colour as the fill colour and then select the **Paint Bucket Tool** 🪣. Click inside the tree top. Similarly, fill brown colour in the trunk.

> Select the **Selection** Tool 🔲 . Double-click on the tree trunk and group them by pressing **Ctrl+G**. Drag the tree trunk over the tree top.

> Now select the complete tree by dragging the mouse around it.

> Choose the **Modify > Group** option or press **Ctrl + G**.

NOTE

You can also select multiple objects by choosing the **Selection Tool**, holding down the **Shift** key and clicking on the objects.

APPLYING GRADIENT FILL

A gradient is a multicolour fill in which one colour gradually changes into another colour. Gradients are formed by mixing of two or more colours in an object. We can either use the in-built gradient presets from the **Swatches panel** or use the **Color panel** to create your own gradients and add them to the **Swatches panel**.

Figure 4.13: Applying Gradient Fill

Follow these steps to apply a gradient fill to an object:

> Select the tree using the **Selection Tool** 🔺 .

> Ungroup the selection by pressing **Ctrl+Shift+G** key combination, or by double clicking on the tree.

> Select the **Paint Bucket Tool** 🪣 .

> Click the **Fill Color** swatch to get the colour palette.

> Select the Green gradient colour effect from the **Swatches** panel, and click inside the top of the tree. The gradient colour fills the shape.

CREATING A NEW GRADIENT

Animate can create two types of gradients –

Linear Gradient changes colour from the starting point to the end point in a straight line.

Radial Gradient changes colour in a circular outward direction, starting from the focal point.

Linear

Radial

Fill Style Box
Extend Color
Reflect Color
Gradient DefinationBar
Repeat Color
Left Pointer
Right Pointer

Figure 4.14: **Color Panel**

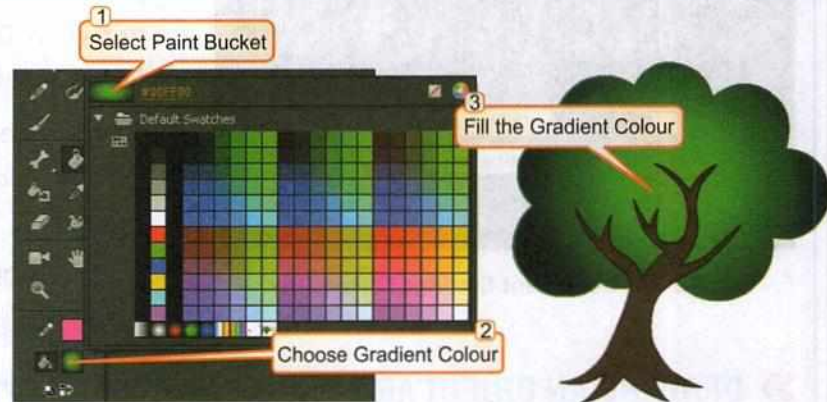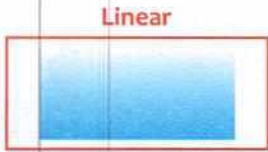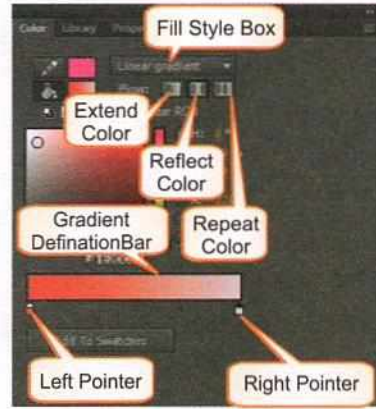To create a new gradient, follow these steps:

➤ Choose the **Window > Color** option to display the **Color** panel.

➤ Choose either **Linear gradient** or **Radial gradient** from the **Color type** drop-down list. Here we have selected the Linear gradient.

➤ Double-click on the **Left Pointer** below the gradient definition bar. The colour palette appears. Select the brown colour.

➤ Double-click on the **Right pointer** and select the orange colour.

➤ Select the **Paint Bucket Tool** 🪣 and click on the trunk of the tree.

➤ Adjust the colour blends of the gradient by moving the **pointers** closer to each other or farther apart.

➤ Select any mode amongst **Extend, Reflect,** or **Repeat** colour under the **Flow** section to apply to the gradient.

➤ To add more colours to your gradient, click anywhere on the gradient definition bar to add a slider (pointer). You can then double-click this slider to set the colour.

NOTE

➤ You can add the new gradient colour in the Swatches panel by clicking on the **Add To Swatches** button below the gradient definition bar. Or
Click on the **Hamburger** button ☰ on the top right corner of the **Color** panel bar and select the **Add Swatch** option from the drop-down menu.

⟫ MODIFYING A LINEAR GRADIENT

As you have filled the Linear gradient shade in the trunk, similarly, fill the Linear gradient colour in the top of the tree. Let us now modify the Linear gradient filled in the tree shape by using the **Gradient Transform Tool** ▦ .

➤ Click on the small triangle on the bottom right corner of the **Free Transform Tool** and select the **Gradient Transform Tool** from the **Tools panel**.

➤ Click on the object filled with gradient colour in it.

➤ The Gradient selection shape will appear as shown in Figure 4.15.

Rotation Handle
Width adjustment handle
This is the center point of the gradient

Figure 4.15: **Modifying a Linear Gradient**

CHANGING THE CENTER OF THE GRADIENT

The center point of the gradient is the place where all the mixing colours are present in equal proportion. To change the center of a gradient, use the following steps:

➤ Bring the pointer over the center point.

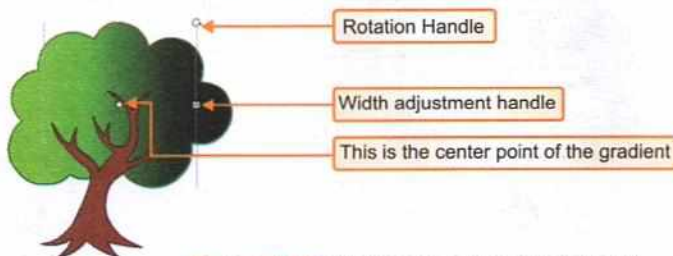➤ Drag the center point in a desired direction to change its position and observe the change.

Figure 4.16: Changing the Center of the Gradient

CHANGING THE WIDTH OF THE GRADIENT

To change the width of the gradient filled inside the shape, follow the steps given below:

➤ Position the pointer over the width adjustment handle. It will change to a double-headed arrow (↔).

➤ Drag the adjustment handle either to the left or right to increase or decrease the gradient's width.
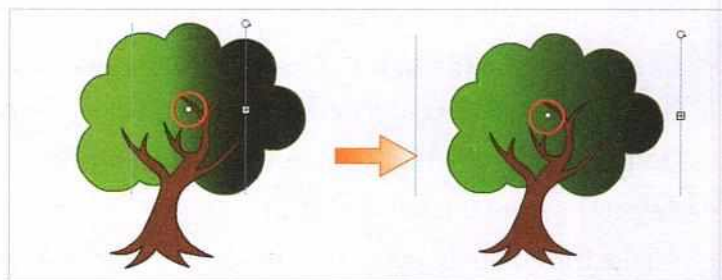
Figure 4.17: Changing the Width of the Gradient

ROTATING THE GRADIENT FILL

To rotate the gradient colour filled inside a shape, follow these steps:

➤ Position the pointer over the **Rotation Handle** ⟳. The pointer shape changes to ↷.

➤ Drag the rotation handle clockwise or anti-clockwise, according to the need and observe the change.
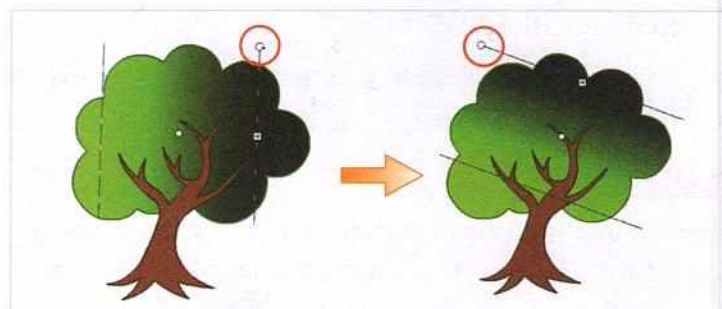
Figure 4.18: Rotating the Gradient Fill

⟫ MODIFYING A RADIAL GRADIENT

Likewise, we can modify a Radial gradient colour filled inside the tree. Let us modify the gradient filled in the shape by using the **Gradient Transform Tool**.

➤ Select the **Gradient Transform Tool** ▣ in the **Tools panel** and click on the object.

➤ The bounding shape will appear as shown in Figure 4.19.

➤ Adjust the gradient as required.

Center of the gradient: We can drag the center point to change the starting point of colour mixing of the gradient.

Rotation handle: We can drag the rotation handle clockwise or anti-clockwise to rotate the gradient as required.

Width adjustment handle: We can drag the width adjustment handle to increase/decrease the gradient's width.

Radius adjustment handle: We can drag the radius adjustment handle to alter the gradient size proportionately.

Figure 4.19: Modifying a Radial Gradient

⨠ EDITING OBJECTS

SELECTING OBJECTS

To edit an object, we need to first select it.

> Click on the **Selection Tool** ⬚.

> Click and drag the selection box around the object and release the mouse button.   Or

> Double-click on the object to select both stroke and fill.

TRANSFORMING THE SHAPE

Using the **Free Transform Tool** ⬚, we can scale, rotate, compress, stretch, or skew lines and shapes.

To **compress** the drawing, follow these steps:

> Draw a hexagon using the **PolyStar Tool**.

> Select the **Free Transform Tool** ⬚ in the **Tools** panel.

> Double-click on the hexagon on the stage to select both stroke and fill. A bounding box appears around the object.

> Drag the handle on the top center of the box down to shrink the hexagon.

| Hexagon | Using Free Transform Tool | Shrinking the Hexagon |
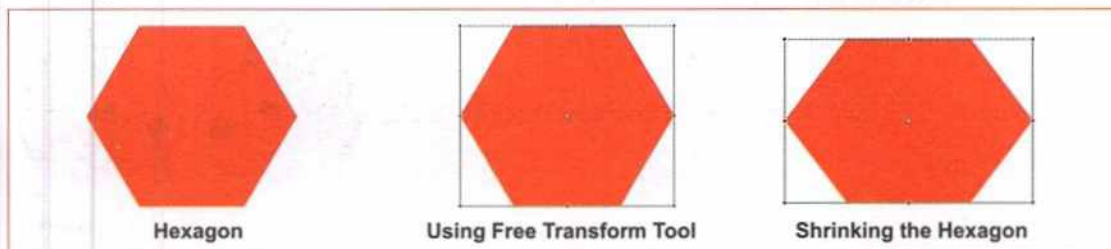
Figure 4.20: Using Free Transform Tool

To scale an object, follow these steps:

> Select the **Free Transform Tool** from the **Tools panel** and double-click on the object.

> To scale the object in both the horizontal or vertical direction, drag one of its corner handles.

> To scale the object horizontally, drag the horizontal center handle. Likewise, to scale the object vertically, drag the vertical center handle.

> Click outside the object to end the transformation.

Vertical Center Handle

Horizontal Center Handle
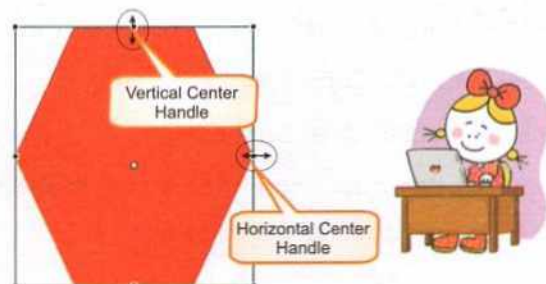
Figure 4.21: Scaling an Object

ROTATING AN OBJECT

Follow the given steps to rotate/skew the object:

> Select the object.

> Select the **Modify > Transform > Rotate and Skew**. Or

- Hover the mouse on one of the corner handles of the object. The pointer changes to a rotation handle ↻.

- Drag the corner handle to rotate the object.

- An outline of the object appears as you rotate.

- Release the mouse button and observe the rotated object.

- To end the transformation, click outside the selected object.

SKEWING AN OBJECT

Skewing an object means slanting the object by a specific angle along with one or both the axes. You can skew an object by dragging or by entering a value in the Transform panel.

- Select the object using the **Free Transform Tool**.

- Choose the **Window > Transform** option.

- Click on the **Skew** radio button and enter values for **Skew Horizontal** and **Skew Vertical** angles.   Or

Hover the mouse on the center handle, the pointer changes to a skew handle (↔).

- Drag the center handle to skew the object.

- Release the mouse button.

- To end transformation, click outside the selected object.

FLIPPING AN OBJECT

- Draw a fish using the **Drawing Tools** and fill colour in it using the **Paint Bucket Tool**.

- Select the fish using the **Selection Tool**.

- Select the **Modify > Transform** option.

- Then, choose either **Flip Vertical** or **Flip Horizontal** and observe the change in the object.

COPYING AN OBJECT

- Select the object that you want to copy by using the **Selection Tool** 🔺.

- Select the **Edit > Copy** option.

- Click on the blank area on the stage.

- Select the **Paste in Center** option from the **Edit** menu. We will get a duplicate copy of the object at the center of the stage.

MOVING AN OBJECT

- Select the object that you want to move by using the **Selection Tool** 🔺. Place the pointer inside the object.

- A **four headed arrow** sign ✛ appears next to the arrow.

- Click and drag the object to a new position.

- Release the mouse and you will see that the object has moved to a new location.
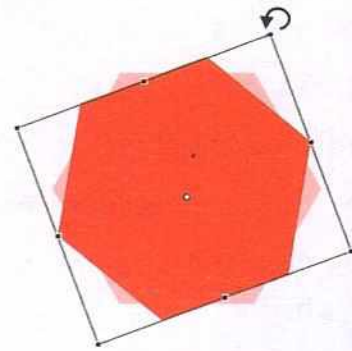
Figure 4.22: Rotating an Object
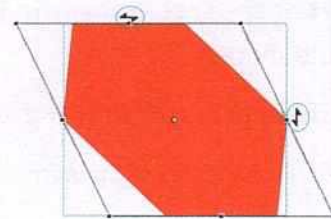
Figure 4.23: Skewing an Object
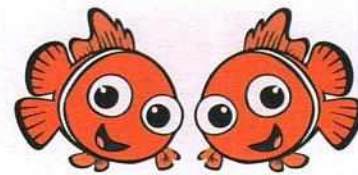
Figure 4.24: Fliping Horizontal

Figure 4.25: Pasting an Object

Figure 4.26: Moving an Object

IMPORTING GRAPHICS

➤ Select the **File > Import > Import to Stage**.

➤ The **Import** dialog box appears.

➤ Browse and select the file that you want to import and click on **Open**.

The picture will be placed on the stage.
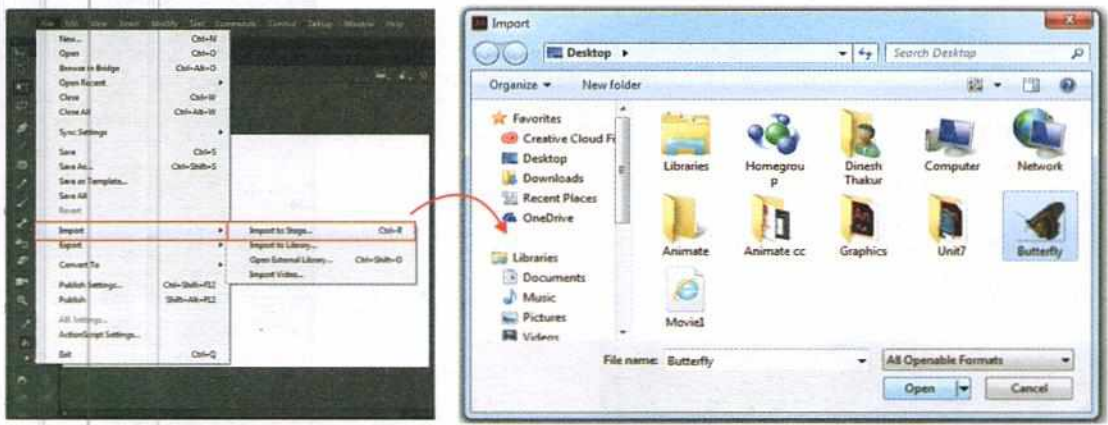
Figure 4.27: Selecting Import to Stage Option

NOTE

To import a file into the Library, select **File > Import > Import to Library**. Drag the library item on to the Stage to use it in your Animate document.

ANIMATION IN ANIMATE

Animation involves a series of still images, usually painted or sketched, displayed in rapid sequence. This transition from one image to another is so quick that it appears to show movement.

Animation in Animate is created by changing the contents of successive frames. We can make an object move across the stage, increase or decrease its size, fade in or fade out, change colour or shape using an animation.

There are two methods for creating an animation in Animate:

FRAME BY FRAME ANIMATION

In Frame-by-Frame Animation, we create an image in every frame.

TWEENED ANIMATION

In the Tweened Animation, we create the starting and ending keyframes to animate the object. Animate itself creates the motion effects in between the frames.

TINT TWEENING

Tint Tweening is used to change the colour of an object. Tint effect works only on symbols and cannot be added to the objects that are drawn directly on the canvas of the movie.

- Select the **Text Tool** in the **Tools panel**. Select **Text > Font > HomewardBound** to set the font type. Choose **Text > Size > 48** from the menu to set the big font size. Select **Text Style > Faux Bold** to make the text bold or we can make changes in the formatting of text in **Properties panel** as shown in Figure 4.28.

- Now type the text – **KIPS** in the work area.

- Click on the **Selection Tool** and select the text. Now click on the **Modify > Convert to Symbol**.

- Type the name 'TEXT' for the symbol in the 'Name' text box in the **Convert to Symbol** dialog box. Select the **Graphic** option from the **Type** drop-down list and click on **OK**.

- Graphic symbol automatically gets saved in the Library.

- Select the **Frame 30** in the Timeline and press **F5** to insert a frame. Insert a keyframe in **Frame 10, Frame 20,** and **Frame 30**.
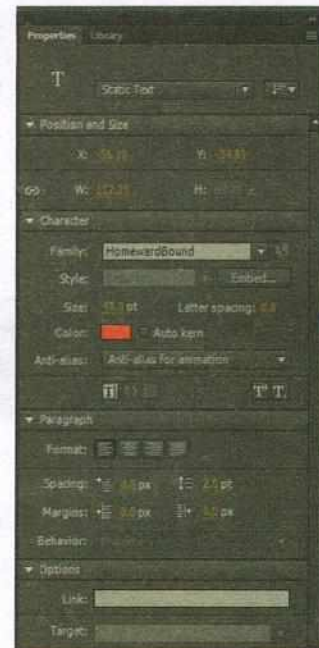
Figure 4.28: Changing Text Properties

- To add Tint effect, select **Frame 1** and click on the typed text.

- In the **Property Inspector**, select **Tint** from the drop-down list of the **Style** option under the **Color Effect** section. Move the **Tint** slider towards right to make it **100%**. Set the colours to **Red=255, Green=0, Blue=0 (RGB Colours)**.

- Similarly, add Tint tweening to **Frame 10** and set the colors **R=0, G=255, B=0**.
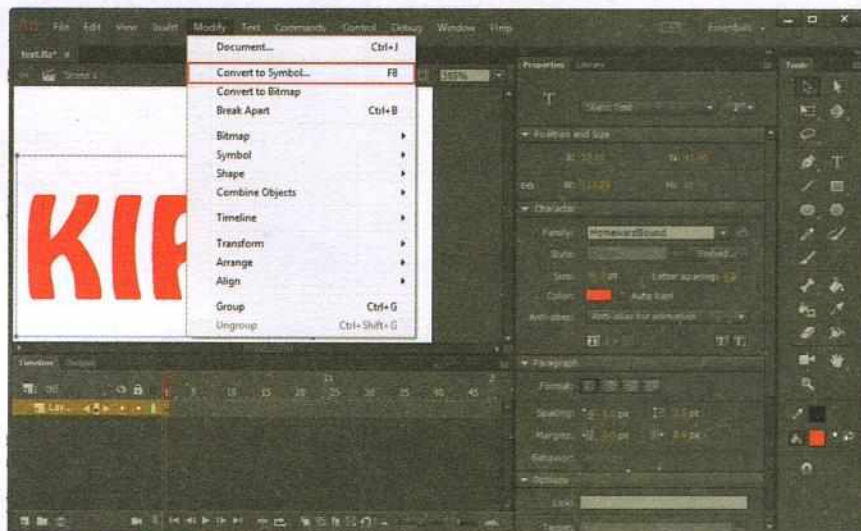
Figure 4.29: Converting Text to Symbol

Figure 4.30: Convert to Symbol Dialog Box

- Add Tint tweening to **Frame 20** and set the colors **R=0, G=0, B=255**. Add Tint tweening to **Frame 30** and set the colors **R=255, G=0, B=0**.

- Right-click on the timeline at any place between **Frame 1** and **Frame 10,** and
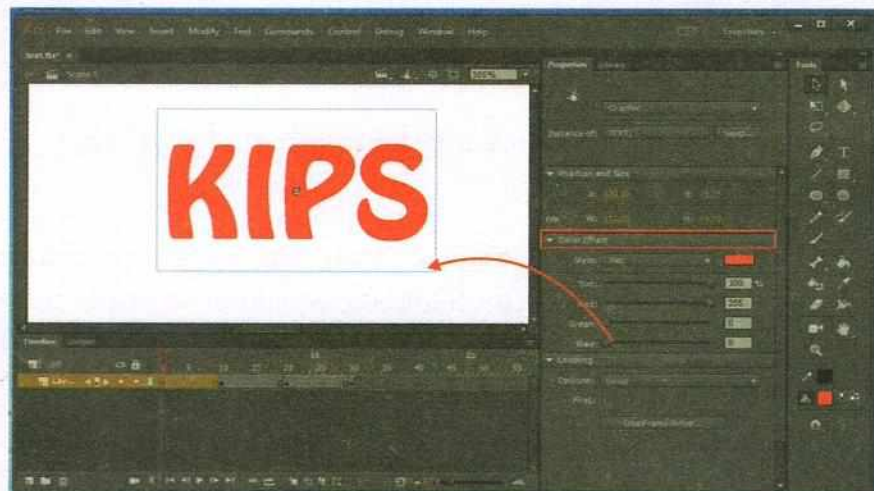
Figure 4.31: Selecting Tint Option

select the **Create Classic Tween** option from the drop-down menu.

- Similarly, right-click on the Timeline at any place between **Frame 10** and **Frame 20**, and between **Frame 20** and **Frame 30**, and choose the **Create Classic Tween** from the drop-down menu.

- Click on the **Control > Test Movie> In Animate** and view the Tint tweening effect on the text.
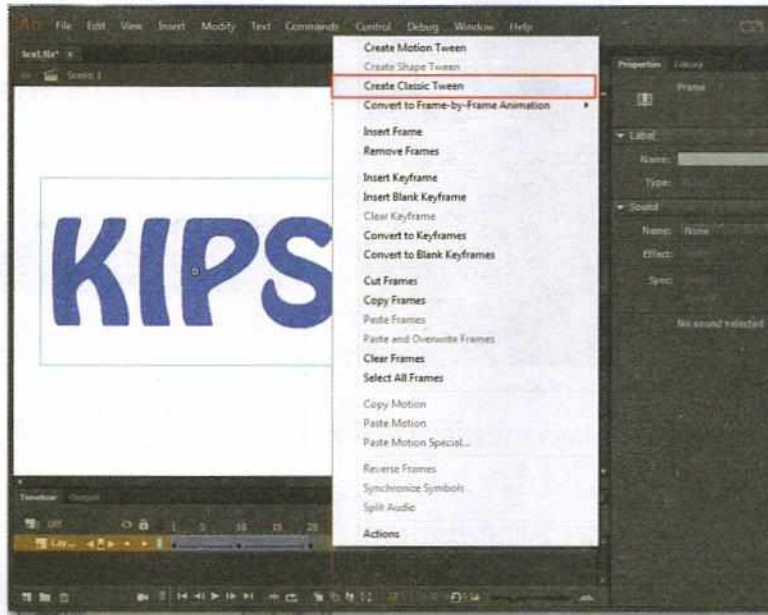
Figure 4.32: Selecting Create Classic Tween Option

CREATING A SIMPLE TEXT SHAPE TWEEN

With Text Shape tweening, we can convert one shape of text into another shape in order to create an animation. We cannot convert an object into a symbol in Shape tweening. Let us try:

- Select the **Text Tool** T and choose **Text > Size > 48** from the main menu and select **Text > Style > Bold** to make the text thick.

- We can also select the font, size, and style from the **Properties** panel under the **Character** section. Click on Color in the **Properties** panel. The colour palette will be displayed. Select any colour of your choice.

- Type the text on the **Stage** in the first frame of the Timeline. Select **Window > Align**. In the **Align** panel, select the **Align to stage** check box ☑. Click on the **Align horizontal center** 🔳 button and **Align vertical center** button 🔳 under the **Align** section. Close the **Align panel** by clicking on the **Hamburger** button ≣ and choose the **Close Group** option.

- Move the pointer at **Frame 50** and right-click the mouse. Select the **Insert Keyframe** option from the pop-up menu.

Figure 4.33: Properties Panel
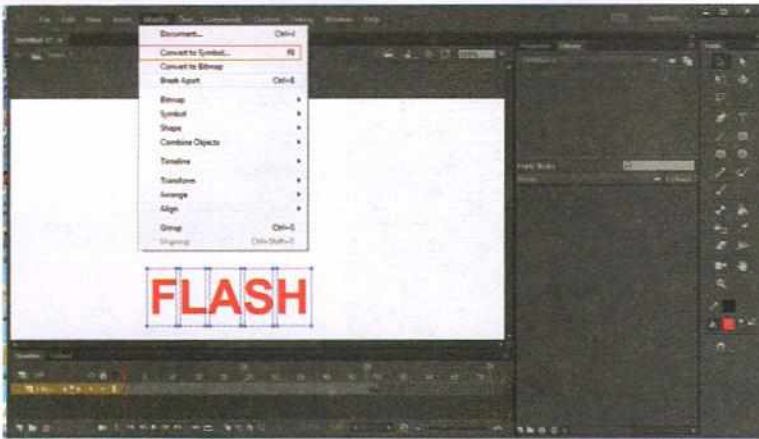
Figure 4.34: **Choosing Break Apart Option**

> Select **Frame 1** and choose the **Break Apart** option from the **Modify** menu. The letters break into separate blocks.

> Again, select the **Break Apart** option. Note the text gets converted into shape.

Figure 4.35: **Inserting Blank Keyframe**

> Now right-click on the **Frame 25** and select the **Insert Blank Keyframe** option.

> Type some new text and then apply **Align horizontal center** and **vertical center** on it.

Figure 4.36: **Selecting Shape Tween**

> Select the text in **Frame 25,** then choose **Modify > Break Apart** twice. Similarly, select the text on **Frame 50** and then choose **Modify > Break Apart** twice.

> Right-click between the **Frame 1** and **Frame 25** and select the **Create Shape Tween** option from the Context menu.

> Then, right-click between the **Frame 25** and **Frame 50** and again select the **Create Shape Tween** option.

> Select the **Control > Play** option from the main menu to play the animation.
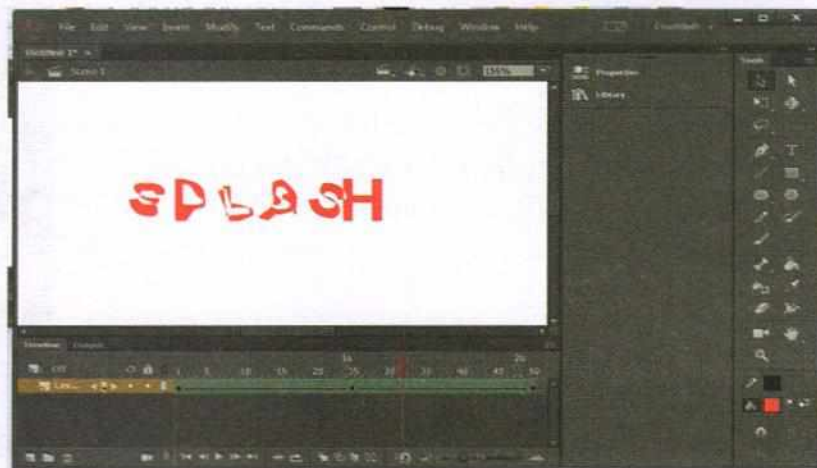
Figure 4.37: **Playing the Animation**

APPLYING FILTERS TO TEXT

Filters allow you to add interesting visual effects to text, buttons, and movie clips. Filters usually involve effects, such as drop shadow, blur, glow, bevel, etc. These effects can be easily applied using the **Properties panel**. Follow the given steps to apply a filter to your text:

> Open a new Animate document.
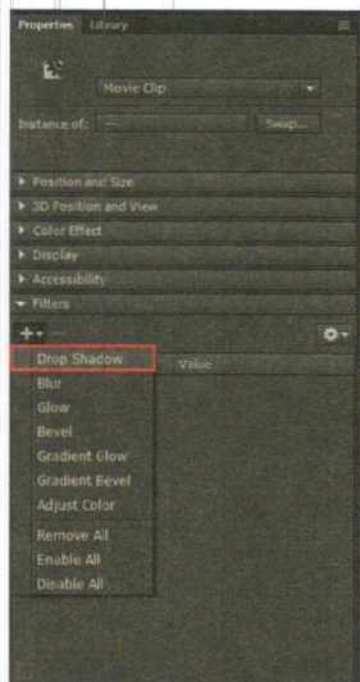
Figure 4.38: Applying Filters to Text

- Select the **Text Tool** from the **Tools panel** and type the text 'Wisdom'.
- Choose the **Selection Tool** and then select **Modify > Break apart**.
- Now convert each letter of your text into a symbol by pressing **F8** and select the 'Movie Clip' type from the 'Convert to Symbol' dialog box.
- Select all the letters using the **Selection Tool**. Click on the **Add Filter** button under the **Filters** section of the **Properties panel**.
- Select the **Drop Shadow** from the Context menu and observe the change. The settings for the applied filter will appear in the **Filters** section of the **Properties panel**.

Figure 4.39: Filtered Text

ANIMATING FILTERED TEXT

Animate provides a unique feature to animate movie clips that have filters using the **Classic Tweens**. You can create an animation that contains light source effects, highlights, bevels, and distortion by changing the filter properties at different keyframes and applying classic tween. Let us create a disappearing text effect on the text with drop-shadow effect created above.

- Select the text 'Wisdom'. Right-click on it and select the **Distribute to Layers** option from the Context menu. This will split all the letters into separate layers.
- Select the layer of the first letter and insert keyframe at the **Frame 10**. Select the layer of the second letter and insert keyframe at **Frame 20**. Repeat this step for all the letters of your text.
- On the timeline, right-click between the two keyframes of a layer and select the **Create Classic Tween** option.
- Repeat the same steps for all the layers.
- Select the **Keyframe 10** for the first letter and click the letter. Select **Alpha** option from the **Style** drop-down list under **Color Effect** section. Now move the Alpha Slider towards left to make it 0%. Repeat this step for all the letters.
- Press **Ctrl + Enter** to preview the animation.

Figure 4.40: Applying Animation to Filtered Text

RECAP

> Animate is a powerful animation software package developed by Adobe Systems.

> The Stage is a drawing board where we can create graphics, animation and make modifications in it. The default stage size is 550 x 400 pixels.

> The major components of the Timeline are – Layers, Frames, and the Playhead.

> Frames are the little rectangular cells that appear on the Timeline. They display the content of the movie at a specific moment of time.

> Keyframes are special types of frames, where we define some change to an objects properties for an animation like, position, colour, shape, etc.

> Playhead is represented by a red frame and red vertical line below it in the Timeline. It indicates the current frame displayed on the Stage. It moves from left to right as the movie is played.

> The Library panel in Animate acts as a store house where symbols created in Animate are stored in an organised manner.

> Animation involves a series of still images, usually painted or sketched, displayed in rapid sequence.

> Tint Tweening is used to change the colour of an object.

> Filters allow you to add interesting visual effects to text, buttons, and movie clips.

BRAIN DEVELOPER

SECTION - A

A. Fill in the blanks.

1. Animate is a powerful .... software package developed by ....

2. The .... is the arrangement of various Animate elements, such as the Tools panel, Control panel, Property inspector, and Stage.

3. The ....is the large white space that is seen at the center of the workspace.

4. The gray area surrounding the Stage is called ....

5. The .... is the area where one controls the sequencing and timing of graphics of a movie.

6. .... are like transparent sheets stacked on top of one another, each containing a different image that appears on the Stage.

HINTS • Stage • Animation • Work Area • Adobe Systems • Workspace • Layers • Timeline

B. State True or False.

1. The shortcut key to import a picture is Ctrl+G. ☐

2. Radial gradient changes colour in a circular outward direction starting from the focal point. ☐

3. In Tweened animation, we can change the contents of every frame to create an animation. ☐

4. The Tools section consists of tools that are used for drawing, painting, and selecting objects. ☐

5. To select multiple objects using the Selection Tool, hold the Ctrl key while clicking on the objects. ☐

6. The default Stage size is 550 x 400 pixels. ☐

C. Application-based questions.

1. Mohit created an animation file using Animate. He wants to convert an object to a symbol using the shortcut key. Which shortcut key should he use?

   ....

2. Chetna wants to create a rainbow scene in Animate. Suggest the tool that she can use to paint the rainbow on the Stage.

   ....

SECTION - B

A. Multiple-choice questions.

1. What are the little rectangular cells that appear on the Timeline called?

   a. Frames   b. Layers   c. Keyframes

2. Which one of the following shortcut keys is used to insert a frame?

   a. F2   b. F5   c. F10

3. Which shortcut key do we use to display Document Settings dialog box?

   a. Ctrl+F3   b. Ctrl+J   c. Ctrl+C

4. Which panel acts as a store house of symbols in Animate?

   a. Library   b. Tools   c. Properties

5. Which shortcut key is used to play the animation in Animate?

   a. Ctrl+Alt   b. Shift+Enter   c. Ctrl+Enter

6. What is the file extension of Animate?

   a. .fla   b. .flash   c. .fas

B. Answer in one line or sentence.

1. What are the default stage dimensions displayed on the Animate Window?

2. Name the parts of Tools panel.

3. Mention the two methods for creating an animation in Animate.

4. Name the types of gradients in Animate.

5. Name the tweened animation that is used to change the colour of an object.

6. Name the shortcut key to insert a blank keyframe.

C. Answer the following questions.

1. What is the use of Tools Panel? Mention its different section.

2. Differentiate between a Frame and a Keyframe.

3. What does the Property Inspector display?

4. What is Gradient.

....

....

5. Briefly explain the term Animation.

....

....

6. What do you understand by Tint Tweening?

....

....

7. Explain the utility of Filters in Animate.

....

....

ACTIVITY SECTION

LAB SESSION   **Perfection Through Practice**

A. Create a Rainy Day Scene by following the given instructions.

BACKGROUND

➤ Draw a rectangle covering the Stage and fill it with gray colour using Gradient effect. Rotate the gradient using the **Gradient Transform Tool** from the **Tools** panel. Lock this layer.

➤ Create a new layer and import a 'Frog' clip Art and a 'Tree' Clip Art onto the Stage and draw some mushrooms as shown in the screenshot.

CREATING RAIN

➤ Create a new layer and rename it as 'Rain'.

➤ Select the **Line Tool** from the **Tools panel**. In the **Property Inspector**, select light gray as the **Stroke color** and **Hairline** from the drop-down list of the **Style** option.

➤ Click on the **Pencil** icon ✎ next to the **Style** option. The **Stroke Style** dialog box appears.

➤ Select the **Dashed** from the **Type** drop-down list and set the value **25** as the **Dash** and **Spacing** options. Click on **OK**.

➤ Draw a line on the Stage. Select the line and right-click on it. Choose **Copy** and **Paste in Place**. Repeat this action to fill the Stage with dashed lines.

➤ Create another layer named as 'Cloud'.

➤ Select the **Oval Tool**, white as **Stroke Color** and **Fill Color**. Apply Linear gradient fill to the clouds.

➤ Draw a small oval shape. Copy it and overlap it on top of the oval shape by selecting the **Paste in Place** option.

➤ Repeat this step to make a cloud shape. Likewise, make a few more clouds and adjust their position by selecting the **Modify > Arrange > Send Backward** option. Click on the Cloud layer and lock it.

➤ Select the Rain layer and convert the rain to a Graphic symbol. Open the symbol editing window and insert a keyframe at **Frame 2**. Move the rain symbol a little in the downward direction. Repeat the same for **Frame 3**.

➤ Click on **Scene 1** to return to the main window. Now, insert frames at **Frame 60** on all the layers.

➤ Select the Rain layer again and tilt the rain symbol a little towards right using the **Free Transform Tool**.

➤ Press **Ctrl + Enter** key combination to preview the animation.

B. Follow the given instructions to create an animation depicting the use of Text effects:

➤ Using the **Rectangle Tool**, draw the board as shown in the figure. Apply gradient shade on the borders of the board.

➤ Create a new layer named as 'Teacher'. Import a teacher clip Art on to stage and convert it into Graphics symbol.

➤ On a new layer named as 'Text', type the text 'Learning Animate CC'.

➤ Select the text using the **Selection Tool** and choose **Modify > Break Apart** to break the text into individual alphabets.

➤ Convert each alphabet to a Movie Clip symbol and distribute all these symbols to separate layers by right-clicking on them and selecting the **Distribute to Layers** option.

Learning Animate CC
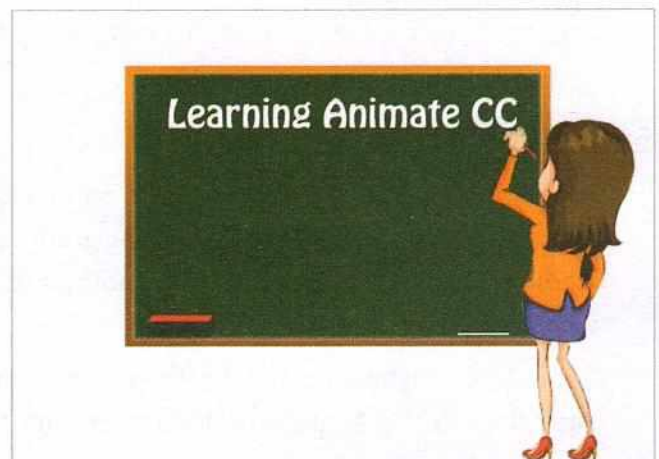
- Insert a keyframe in **Frame 3** on the first alphabet layer, **Frame 6** on second alphabet layer, and so on till **Frame 51** on the last alphabet layer.

- Insert keyframe at **Frame 51** on all the layers.

- Now, right-click on **Frame 1** of first alphabet layer followed by a click on the first alphabet on the Stage. In the **Properties panel**, select **Alpha** option from the **Style** drop-down list under the **Color Effect** section. Repeat this for all the alphabet layers.

- Apply **Classic Tween** on the 'Teacher' layer and move the teacher across the board.

- Set the speed of the animation to **10** fps.

- Press **Ctrl + Enter** to preview the animation.

GROUP DISCUSSION — For Concept Clarity

Conduct a group discussion on the topic: **Types of Tweened Animation**.

PROJECT WORK — Using Creativity

Make a chart on various tools of Adobe Animate under the title, **Understanding the Animate Environment**.

ONLINE LINK — Looking For More

To know more about Animate, visit:

https://helpx.adobe.com/animate/using/documents.html

WORKING WITH LAYERS

Layers are like transparent sheets that can hold objects and are stacked on top of each other. Layers are useful while developing a big animation movie. When you have to use a number of objects, it is always better to distribute the objects in different layers as it makes the work process much easier. Layers allow you to organise the artwork, animations, and other elements of your movie. You can draw and edit objects in one layer without affecting the objects in another layer.

Although you can activate one layer at a time, yet you can select more than one layer at the same time. You can add a number of layers, hide and lock the layers, change the position of the layers, delete the layers, and even customise the layers as well. When you add an object in a layer, the file size increases. The standard view of a layer is shown in Figure 5.1.
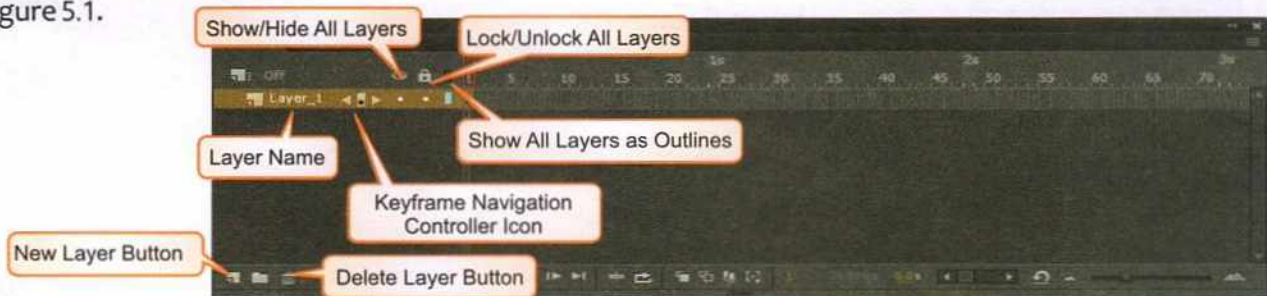
Figure 5.1: Displaying the Layer Components

SELECTING A LAYER

To make a layer active, either select the layer in the Timeline or select a stage object in the layer. The active layer is highlighted in the Timeline and is indicated with a **Keyframe Navigation Controller** icon.

Figure 5.2: Selecting a Layer

RENAMING A LAYER

Method 1:

➤ Select the layer which you want to rename.

➤ Double-click on the layer name and type the new name.

Method 2:

➤ Right-click on the layer name. Select the **Properties** option from the Context menu. Or

Choose **Modify > Timeline > Layer Properties** from the menu.

Figure 5.3: Renaming a Layer

➤ The **Layer Properties** dialog box appears. Type the new name in the **Name** text box and click on **OK**.

ADDING NEW LAYERS

To add layers, do one of the following:

➤ Click on the **New Layer** button 🔲 at the bottom of the Timeline.   Or

Select the **Insert > Timeline > Layer**.

➤ A new layer appears above the selected layer, and the new layer becomes the active layer.
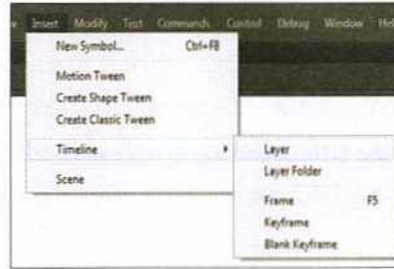
Figure 5.4: Creating a New Layer

ACTIVITY ZONE
For Better Concept Clarity

➤ Choose the **Line Tool** ▱ and draw the fence as shown in the figure. Click on the **Fill Color** box and select the required colour.
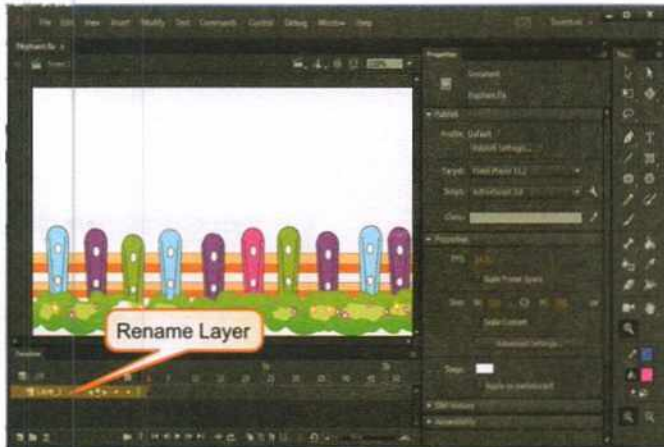
Layer Properties Dialog Box

Drawing a Fence
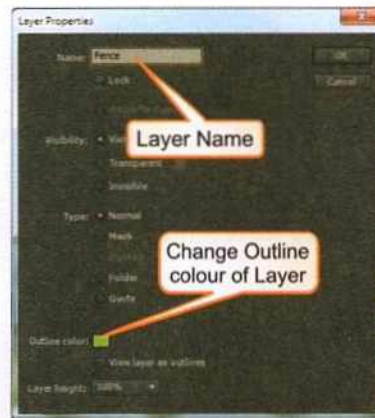
➤ Choose the **Paint Bucket Tool** 🪣 and click inside the fence. Rename the Layer_1 as **Fence**.

➤ Add a new layer and double-click on the layer name, type **Elephant** as the new name for the layer and press the **Enter** key.

➤ Draw an Elephant by using the tools from the **Tools panel**.

➤ Save the file using the **Ctrl+S** key combination.
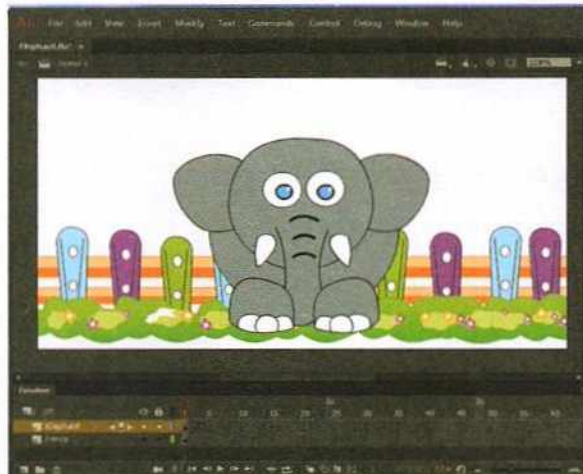
Adding the Elephant Layer

CHANGING THE ORDER OF LAYERS

The order of the layers on the timeline determines the order of the different objects that appear on the Stage. When images on different layers overlap, objects in the upper layer appear on top of the objects in layers below them. To change the order of the layer, click on the layer name that you want to move and drag it to the required position.

Figure 5.5: Selecting the Elephant Layer **Figure 5.6:** Dragging the Elephant Layer

To place the Elephant layer behind the Fence layer:

➤ Click on the **Elephant** layer in the Timeline.

➤ Drag the **Elephant** layer downward to place it below the **Fence** Layer.
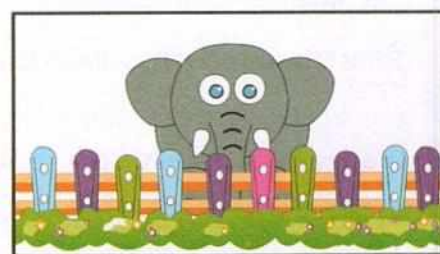
Figure 5.7: Elephant Dragged behind the Fence

HIDE AND SHOW A LAYER

You can hide the layers to view the contents on the other layers. While hiding the layers, you have the option either to hide all the layers in your document at once or hide the layers individually.

➤ Click on the **Eye** icon 👁 above the layers. A white cross ✖ symbol appears in the Eye column. You will find that all the contents disappear from the stage.

Figure 5.8: Hiding Layer

➤ Click on each white cross ✖ symbol one by one in the column, and observe that the contents on the layer reappear on the stage.

LOCK A LAYER

You can lock the layer to avoid any further changes to the content.

➤ Click on the **Fence** layer to make it active.

➤ In the Timeline, click on the white dot under the **Lock** column 🔒.

➤ A **padlock** icon 🔒 appears, indicating the layer is now locked.

Figure 5.9: Locking a Layer

➤ Using the **Selection Tool** 🖱, try to drag the fence drawn on the Stage. You will not be able to do so because the **Fence** layer is locked.

CREATING AN ANIMATION WITH MULTIPLE LAYERS

DRAWING A BUILDING

➤ Create a new file by clicking on the **File > New**.

➤ Select the **View > Grid > Show Grid** option.

➤ Draw the building using various tools from the **Tools panel.**

➤ Select a colour from the **Fill Color** box, choose the **Paint Bucket Tool** and click inside the building. Rename the layer as **Building.**

CREATING THE SKY

➤ Create another layer and rename it as **Sky.**

➤ Select the **Rectangle Tool** 🔲.

Figure 5.10: Drawing a Building

- Draw sky by using blue as the **Stroke Color** and **Fill Color**.
- Choose the **Window > Color** option to display the **Color** panel.
- Select the **Linear gradient** option from the **Color type** drop-down list in the **Color** panel.
- Double-click on the left and right **color markers,** and set the colour as light blue and dark blue respectively.
- Select the **Paint Bucket Tool** and click inside the rectangle.
- Select the **Gradient Transform Tool** from the **Tools** panel and click on the sky object. Drag the middle handle to shift the gradient and adjust the corner handle to rotate the gradient.
- Now, move the **Sky** layer just below the **Building** layer.
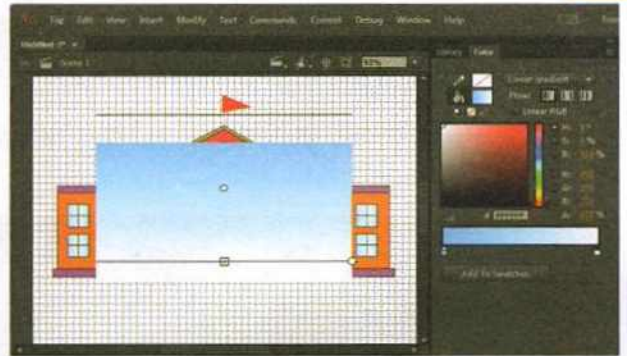
Figure 5.11: Creating Sky

ADDING GRASS AND ROAD

- Add a new layer and rename it as **Grass and Road**.
- Select the **Rectangle Tool**. Click on the **Stroke Color** box and select **No Color**. Select the **Fill Color** box and choose bright green as the fill colour.
- Draw a rectangle below the building for the grass.
- Similarly, select the bright grey as the fill colour.
- Draw a rectangle below the grass for the road as shown in Figure 5.12.
- Move this layer just below the **Building** layer.
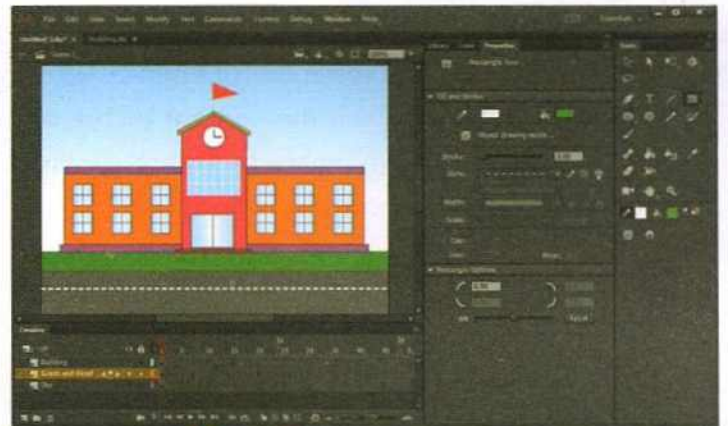
Figure 5.12: Drawing Grass and Road

DRAWING A TREE

- Add a new layer above the **Building** layer by clicking on the **New Layer** button. Rename it as **Tree**.
- Draw the trunk and top of the tree separately. Fill the colour brown in trunk and green in the top. Place the top of the tree on the trunk with the help of the **Selection Tool**. Select both the objects and group them by pressing **Ctrl+G**. Convert it into symbol by pressing the **F8** key.
- Type the name **Tree** in the **Convert Symbol** dialog box and click on **OK**. Place the **Tree** to the left of the building. Now create a duplicate copy of the tree. Place this duplicate **Tree** to the right of the building.

DRAWING A CAR

- Make the **Tree** layer active and insert a new layer and name it as **Car**.
- Draw a car by using the **Oval** and **Rectangle** tools as shown in Figure 5.14.
- Select the car by using the **Selection Tool**.
- Convert it into the symbol and place the **Car** instance onto the Stage.

MOVING THE CAR

- Extend the **Sky, Grass and Road, Building, Tree,** and **Car** layers by clicking **Frame 60** and insert frames in them by pressing **F5** key.
- Choose the **Selection Tool**. Click and drag the car to the right side of the Stage.

> Right-click on **Frame 1** and select the **Create Motion Tween** option. Drag the playhead to **Frame 60**.

> Move the car to the left side of the Stage.

> Press **Ctrl + Enter** or **Control** > **Test Movie** > **In Animate** to preview the animation.

Figure 5.13: **Creating a Motion Tween**

Figure 5.14: **Moving Car on the Stage**

⧉ MASKING IN ANIMATE

In Animate, masking is a way to selectively hide and display the content on a layer. The mask layer contains a mask item that can be a filled shape, a typed object, an instance of graphic symbol, or a movie clip on one layer. This acts as a hole through which we see the content of the other layers beneath it. Masking is often used in Animate to create spotlight effects that would display the text or object through a hole.

CREATING A MASK LAYER

> Open a new file in Animate.

> Change the background colour to dark blue by clicking the **Color** box in front of the **Stage** option in the **Properties** panel.

> Double-click on the layer and type the name **Text**.

> Select the **Text Tool** and type **HARDWORK**.

> Choose the **Selection Tool** from the **Tools Panel** and select the text.

Figure 5.15: **Selecting Background Color**

Figure 5.16: **Creating Motion Tween on the Text**

> Choose Font Family **Arial**, Style **Bold**, Size **80**, and Color **White** from the **Properties** Panel.

> Convert the text to a 'Graphic Symbol' by selecting the **Modify** > **Convert to Symbol.**

> Extend the layer by selecting **Frame 40** and pressing the **F5** key.

> Using the **Selection Tool,** drag the text off the top-left side of the Stage, on to the work area.

> Right-click on **Frame 1** and select the **Create Motion Tween** option from the Context menu that appears. Drag the playhead to **Frame 40**.

> Select the text and drag it to the bottom-right corner of the Stage.

- Insert a new layer and rename it as **Mask.**

- Select the **Oval Tool** and pick any Fill Colour. Draw an oval shape in the center of the Stage. The width of the oval should be larger than the text symbol.

- Right-click on the **Mask** layer and select the **Mask** option from the Context menu that appears. This will convert the layer to a Mask layer and the tween layer gets indented underneath. Both layers are locked automatically.
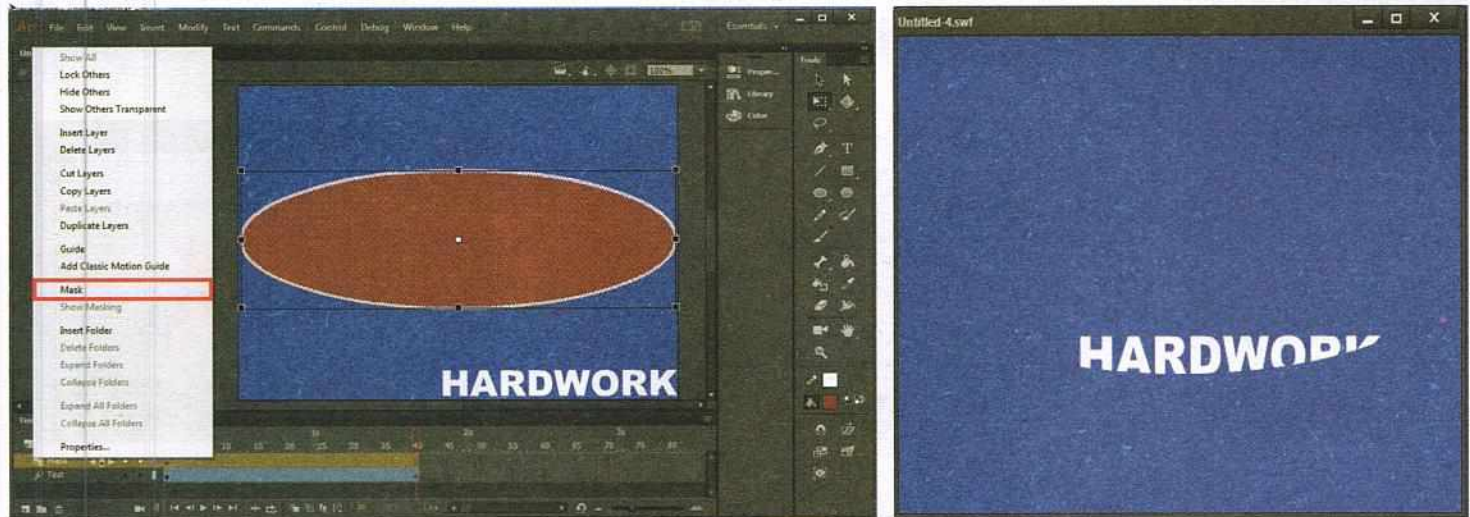
Figure 5.17: Selecting Mask Option

- Press **Ctrl + Enter** or select **Control > Test Movie > In Animate** to preview the animation. The text animates through the stage.

ROTATION WITH MASKING EFFECT

- Open a new file by clicking the **File > New** option.

- Import an image to the Stage by selecting the **File > Import > Import to Stage.**

- Select the **Free Transform tool** and drag the image to fit in accordance with the Stage.

- Right-click on **Frame 60** and select the **Insert Frame** option from the displayed list.

- Rename the image layer as **Nature.** Lock the **Nature** layer.

- Add one more layer by clicking the **New Layer** button. Name the layer as **Star Mask.**
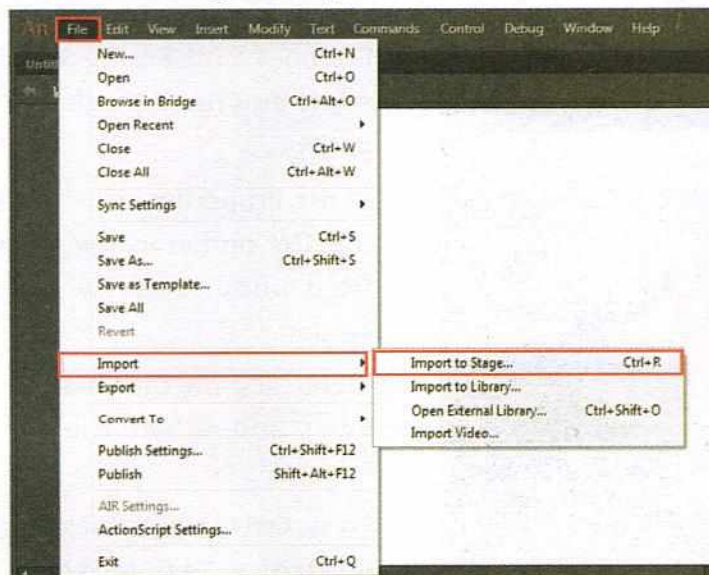
Figure 5.18: Importing Image to Stage

> Select the **Star Mask** layer and draw a star on **Frame1** by selecting the **PolyStar Tool** ⬡. Click on the **Options** tab under the **Tool Settings** section in the **Properties** panel.

> Select the **star** option from the **Style** drop-down list. Define the number of sides and click on **OK**.

> Select the **Fill Color** either from the **Properties** panel or from the **Tools** panel with no **Stroke Color**. Draw the star at the center of the image.

Selecting the PolyStar Tool	Selecting the Star Option	Drawing Star on the Stage
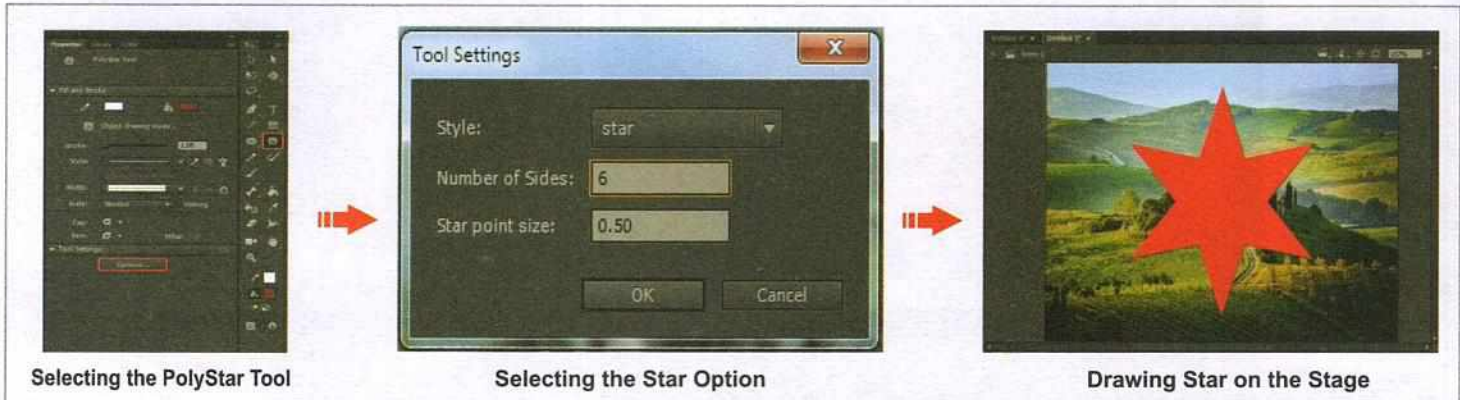
Figure 5.19: Drawing a Star

> Click on the **Selection Tool** 🔺 and select the **Star**. Convert the **Star** into the symbol by pressing the **F8** key.

> Define **Graphic** behaviour, and type the name **Star** in the **Name** box. Click on **OK**.

> Select the **Free Transform Tool** and reduce the size of the star. You can also reduce the size of the star by pressing the **Ctrl + Alt + S** key combination.

> Right-click on **Frame 60** and select the **Insert Keyframe** option from the Context menu. Now increase the size of the star in **Frame 60**. Right-click in between the **Frame 1** and **Frame 60** and select the **Create Classic Tween** option.

> In the **Properties** panel, select the **CW** option in the **Rotate** field under the **Tweening** section.

> Right-click on the **Star Mask** layer and select the **Mask** option.

> Press **Ctrl+Enter** or select the **Control > Test Movie > In Animate** to play the movie.

Figure 5.21: Selecting the Mask Option
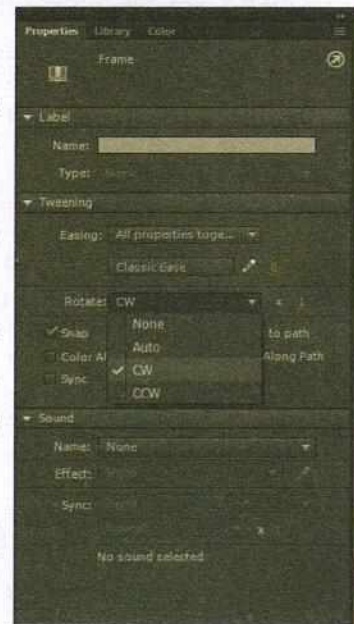
Figure 5.20: Selecting Clockwise Rotation Option

ONION SKINNING

The Onion Skin feature allows you to see a faint ghost image of the previous frame, which helps you in placing the image for the next frame. By clicking on the **Onion Skin** button 🖼, you can see several frames before and after the current frame. In Animate CC, you can choose between the following two types of Onion Skinning:

Onion Skin 🖼 : It shows the frame in full colour.

Onion Skin Outlines 🖼 : This option displays only the outline of the object in the frames.

Observe, when you select the **Onion Skin** option, the frame on which you are working appears in full colour, while the surrounded selected frames appear dimmed. Let us try our hand on the Onion Skin feature:

Figure 5.22: Onion Skin Tools

➤ Click on the **Onion Skin** or **Onion Skin Outlines** button at the bottom of the Timeline.

➤ Drag the markers above the timeline to view multiple frames at once.

➤ All the frames will be displayed superimposed over each other.

CREATING AN ANIMATION BY USING ONION SKIN

➤ Open a new file.

➤ Import any background image on the Stage by selecting the **File > Import > Import to Stage**.

➤ Lock the Background layer.

➤ Add a new layer and rename it as **Elephant**.

➤ Draw an Elephant on the Stage as shown in Figure 5.23. Make a separate group for each part of the elephant.

Figure 5.23: Selecting the Onion Skin Button

➤ Select the **Onion Skin** button 🖼.

➤ Right-click on **Frame 3** and select the **Insert Keyframe** option from the Context menu.

Figure 5.24: Modification by Selection Tools

➤ Choose the **Selection Tool** 🔲 and select the elephant. Move the elephant slightly towards the left side on the stage.

➤ Modify its parts in the walking position using the **Selection Tool** and **Free Transform Tool**.

➤ Click on the **Frame 5**, and press **F6** to insert a keyframe.

➤ Repeat the above procedure to give movement to the elephant.

➤ Repeat the steps to insert keyframes from **Frame 7** to **25**. Make changes in each new frame.

- To play the animation repeatedly, select the **Control > Loop Playback** option.

- Select the **Control > Play** to view the animated effect on the elephant.

Figure 5.25: Selecting Loop Playback and Play Option
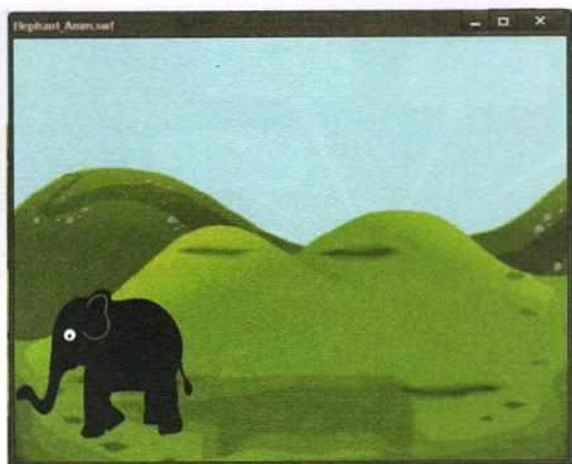
Figure 5.26: Playing a Movie

- To stop the movement, select the **Control > Stop** option.

RECAP

- Layers are like multiple transparent sheets that can hold objects and are stacked on top of each other.
- An active layer is highlighted in the Timeline and is indicated with a Keyframe Navigation Controller icon.
- The order of the layers on the timeline determines the order of the different objects appearing on the Stage.
- In Animate, masking is a way to selectively hide and display the content on a layer.
- The Onion Skin feature allows you to see a faint ghost image of the previous frame.
- In Animate, there are two types of Onion Skinning: Onion Skin and Onion Skin Outlines.

BRAIN DEVELOPER

SECTION - A

A.   Fill in the Blanks:

1.   Layers are like multiple .... sheets that can hold objects and are stacked on top of each other.

2.   The active layer in the Timeline is indicated with a ....

3.   When you take an object out of the Library, the object is referred as an .... of a symbol.

4. To display the grids on the stage, select the .... > .... > ....

5. .... is an object that acts as a hole through which we see the contents of a layer or layers beneath it.

B. Write True or False.

1. In Animate, only one layer can be activated at a time.

2. You can convert an object to a symbol by using the F8 key.

3. The speed of the animation can be adjusted in the work area.

4. Masking hides the other parts and shows only those parts of an image that appear underneath the object on which we are applying the masking effect.

5. An animation cannot be repeated more than once.

C. Application based questions.

1. Himani has imported an image of the jungle scene to a layer. She has drawn a polygon shape in another layer. She wants to create the spotlight effect that would display the animals and the jungle scene through the polygon object. Suggest the effect which can meet her requirement.

....

2. Isha is a Fine Arts student. She has drawn various sketches in different layers in Animate. Now she does not want to make any further changes to her sketches. Which option should she use to do so?

....

D. Multiple-choice questions.

1. Which tool allows you to see a faint ghost image of the previous frame?

   a. Onion Skin   b. Timeline   c. Layer

2. Which option is used to repeat the animation?

   a. Ctrl+F6   b. Ctrl+Play   c. Ctrl+Loop Playback

3. Which key combination can group the objects in Animate?

   a. Ctrl+O   b. Shift+G   c. Ctrl+G

4. Which key will you press to insert a keyframe?

   a. F4   b. F5   c. F6

E. Answer the Following:

1. What do you understand by the term Layer?

....

....

....

2. What do you understand by hiding and showing a layer? How will you hide a layer?

....

....

3. Write any two methods to rename a layer.

....

....

4. What do you know about masking in Animate?

....

....

....

ACTIVITY SECTION

LAB SESSION   **Perfection Through Practice**

Follow the given instructions to create a 'Classroom Scene' depicted through Pencils:

➤ Create a background using the **Rectangle Tool** from the **Tools panel**.

➤ Add a new layer, 'Teacher,' and draw an image of a pencil representing the teacher, using various tools from the **Tools panel**.

➤ Create another layer, 'Children,' and draw the given set of pencils depicting the children.

➤ Using the **Onion Skin** feature, apply motion to the teacher and to the hands of the children for 25 frames.

To create the text Masking effect:

➤ Create another layer and name it as 'Text'. Type the text, 'Learn with Kips'.

➤ Convert this text to 'Movie Clip' symbol by pressing the **F8** key. Double-click on the symbol to open the editing mode.

➤ From the **Properties** panel, apply the **Drop Shadow** and **Gradient Glow** filter to the text.

➤ On a new layer named as 'Rectangle Mask', create a lemon coloured rectangle before the text. Remember, the height of the rectangle should be a little larger than the text.

➤ Convert it into 'Graphic symbol' in **Frame 1**.

➤ Right-click on **Frame 1** of this layer and select the **Create Motion Tween** option. On **Frame 25**, stretch the rectangle till it covers the complete text.

➤ **Copy** the text from **Frame 1** of 'Text' layer and **Paste in Place** on a new layer named, 'Final' on top of all the layers.

➤ Insert Frames at **Frame 40** on all the layers. Lock the 'Text' and 'Rectangle Mask' layers.

➤ Right-click on the 'Final' layer and select the **Mask** option. Click on **Scene 1** to return to the Classroom Scene and press **Ctrl + Enter** to preview the animation.
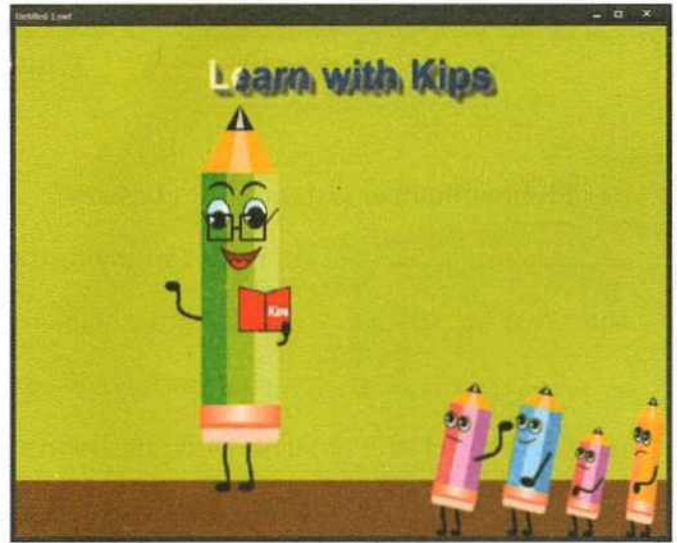
GROUP DISCUSSION   For Concept Clarity

Divide the class into groups and conduct a group discussion on the topic:
Masking in Animate

PROJECT WORK   Using Creativity

Make a project on **Solar System** in Animate. Apply the rotation effect on the planets.

ONLINE LINK   Looking For More

To know more about Animate, visit:
https://helpx.adobe.com/in/animate/using/animation-basics.html

A. Fill in the blanks.

1. Hexadecimal number system has the base ....

2. .... means arranging the data either in an ascending or descending order.

3. The .... feature helps in determining input values needed to achieve a specific goal.

4. .... shortcut key is used to convert an object into a symbol.

5. The active layer in the Timeline is indicated with a ....

6. .... operator is used to concatenate or join two or more strings.

B. State True or False.

1. In binary addition, 1 + 1 equals to 0.

2. Subtotals can only be applied on sorted data.

3. The Tint tweening effect can not be applied on a symbol.

4. In a database, records refer to rows and fields refer to columns.

5. You can hide all the layers in your Animate document at once.

6. The order in which the operators are evaluated is called precedence of operators.

C. Identify the types of charts and name them in the given spaces.

D. Match the following.

View the property panel		F6
Insert a keyframe		Ctrl+F3
Play the animation		Ctrl + G
Grouping the object		Ctrl + Enter

A. Choose the best answer.

1. The base of binary number system is ....
   - a. 2
   - b. 5
   - c. 1

2. The default extension of Animate file is ....
   - a. .fla
   - b. .snif
   - c. .fis

3. Which icon is used to indicate Keyframe Navigation Controller?
   - a.
   - b.
   - c.

4. Which of the following options is used to define the speed of animation in the property inspector?
   - a. Repeat
   - b. FPS
   - c. Frame rate

5. Urinary operators work on .... operands.
   - a. one
   - b. two
   - c. three

B. Answer in one word.

1. Name the number system that is used by all digital computers. ....

2. Which button, under the Data tab, is used to remove duplicate values from one or more columns? ....

3. Which function key is used to insert a Chart instantly in a worksheet? ....

4. Name given to = operator. ....

5. Name given to ** operator. ....

C. Answer the following questions.

1. Briefly explain the Octal number system.
   ....
   ....

2. What do you understand by the term Data Consolidation?
   ....
   ....

3. What is the utility of Tint Tweening?
   ....
   ....

D. Do as directed.

1. $(58)_{10} = (\quad)_2$

2. $(10011)_2 = (\quad)_{10}$

MORE ON PYTHON

In the previous class, you have learnt how to declare and initialise variables. Now, you will learn how to use operators to perform arithmetic and logical operations in programming.

Operators are symbols that perform arithmetic and logical operations on operands and provide a meaningful result. An operator needs one or more operands to perform any operations. The valid combination of both operands and operators makes an **expression** which returns a computed result.
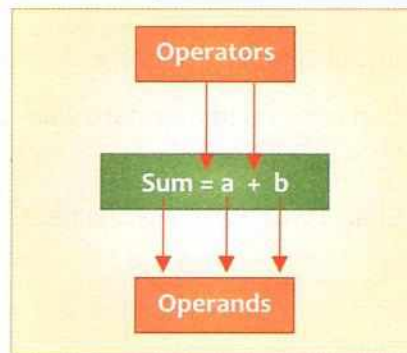
⧽ TYPES OF OPERATORS IN PYTHON

Operators can be of different types based on the kind of operation they perform:

1. ARITHMETIC OPERATORS

The arithmetic operators are used to perform basic mathematical calculations, i.e., Addition (+), Subtraction (-), Multiplication (*), Division (/), etc.

The Arithmetic operators can be further classified as:

Unary Operator: These operators operate on only one operand, e.g., a= +100 (the value assigned to 'a' is +100), b= -100 (the value assigned to 'b' is -100).

Program 1:

Figure 6.1: Unary Operator

Binary Operator: These operators operate on two operands, e.g., a+b. Here '+' is a binary operator working on 'a' and 'b'. Binary operators can further be classified as:

Operator	Symbol	Usage	Application
Addition	+	To obtain the sum of the values	Value of 13+3.5 is 16.5
Subtraction	-	To subtract the values	Value of 45 - 35 is 10
Multiplication	*	To find the product of the data	Value of 6.2*6 is 37.2
Division	/	To divide the numbers and give an output in the decimal form	• Value of 5/2 is 2.5 • Value of -5/2 is -2.5 • Value of 10.0/3 is 3.333
Floor Division	//	To divide the numbers and give an output in the integer form	• Value of 5//2 is 2 • Value of -5//2 is -3
Remainder	%	To find the remainder when one value is divided by the other.	• Value of 3%2 is 1 • Value of 10%6 is 4 • Value of 6%10 is 6
Exponential	**	To calculate the power of numbers	• Value of 2**3 is 8

Program 2:

Figure 6.2: Binary Operator

Output

STRING OPERATORS

While working with the string values, we may have to perform some operations on them. Python allows only two kinds of operations on string data types. We can either join two strings or replicate a string multiple times. For these two operations, we use '+' and '*' operators on strings respectively. '+' operator is termed as the **concatenation operator** when we use it with strings. It is used to concatenate or join two or more strings.

Program 3:

Figure 6.3: Concatenation Operator

'*' operator is used to replicate a given string specified times. It is also known as **Replication Operator**.

Program 4:

Figure 6.4: String Replication

Here, the '*' operator is used to print the string, 'Welcome' three times as you can see in output above.

PRACTICE TIME

Predict the output of the following statements:

SNo.	Statement	Output
1.	print(52*7)	
2.	print("52*7")	
3.	print("52*7 =", 52*7)	
4.	print("52"*7)	

Solved Programs:

Program 5: Write a program to find the area and circumference of a circle whose radius is entered by the user.


```python
r=float(input("Enter the radius of the circle:"))
c=2*3.14*r
ar=3.14*r*r
print("The circumference of the circle is:", c)
print("The area of the circle is:", ar)
```

Output:
```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul
2019, 19:29:22) [MSC v.1916 32 bit (Intel)]
n win32
Type "help", "copyright", "credits" or "lic
se()" for more information.
>>>
 RESTART: C:/Users/abhay/AppData/Local/Prog
ms/Python/Python37-32/CT_page93.py
Enter the radius of the circle:21
The circumference of the circle is: 131.88
The area of the circle is: 1384.74
```

Figure 6.5: Program to find the Area and Circumference of a circle   **Output**

Program 6: Write a program to print the string entered by the user five times.


```python
str=input("Enter the String:")
print(str*5)
```

Output:
```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul
2019, 19:29:22) [MSC v.1916 32 bit (Intel)]
n win32
Type "help", "copyright", "credits" or "lice
se()" for more information.
>>>
 RESTART: C:/Users/abhay/AppData/Local/Progr
ms/Python/Python37-32/CT_page93_2.py
Enter the String:Python
PythonPythonPythonPythonPython
>>>
```

Figure 6.6: Printing a String   **Output**

ASSIGNMENT OPERATOR

Assignment operator (=) is used to assign a value to a variable. It assigns the value on its right side to the variable written on the left of it. We have used this operator previously in the programs.

Program 7:

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 19:29:22
916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more
on.
>>> a=10          # assigning the value 10 to the variable a
>>> a
10
>>> b=a*10        # assigning the product of a and 10 in b
>>> b
100
>>>
```

Figure 6.7: Assignment Operator

In the above example, we have assigned the value 10 to the variable 'a' and then the product of 'a' and 10 is assigned to the variable 'b'.

RELATIONAL OPERATORS

Relational Operators are used to show the relationship between operands. These operators compare the values of variables and determine the result in a Boolean expression, which is either **'True'** or **'False'**. Python provides six types of relational operators as shown in the table given below:

Operator	Format	Expression a=12 b=4	Result
Less than	<	a<b	False
Less than or equal to	<=	a<=b	False
Equal to	==	a==b	False
Greater Than	>	a>b	True
Greater than or equal to	>=	a>=b	True
Not equal to	!=	a!=b	True

Let us understand these operators with the help of a program in Python.

Program 8:

```
>>> a=100
>>> b=200
>>> c=100
>>> a<b          # Use of less than operator
True
>>> a<=c         # Use of less than or equal to operator
True
>>> a==b         # Use of equal to operator
False
>>> a==c
True
>>> a>b          # Use of greater than operator
False
>>> b>=a         # Use of greater than or equal to operator
True
>>> a!=b         # Use of not equal to operator
True
>>>
```

Figure 6.8: Relational Operator

LOGICAL / BOOLEAN OPERATORS

The Logical or Boolean operators evaluate to one of the two states, either **True** or **False**. We use these operators in Python to make comparisons. There are mainly three types of Boolean operators, i.e., **AND**, **OR**, and **NOT**.

Operator	Example (if a=5 and b=10)	Output	Explanation
and	a= = 5 and b>=10	(a= = 5) -> True (b>=10) -> True	So the result of the expression is True
or	a<5 or b!=10	(a<5) -> False (b!=10) -> False	So the result of the expression is False
not	not (a !=5)	(a!=5) -> False	So the result of the expression is True

⮞ OPERATOR PRECEDENCE

An expression in Python may have more than one operator involved in it. When more than one operator is to be evaluated in an expression, the Python interpreter decides at run time which operator should be evaluated first. This decision is based on the precedence and associativity of the operators as explained below.

Precedence: Precedence is the priority order of an operator according to which it is evaluated. Each operator has precedence associated with it. This precedence is used to determine the order of evaluation of an expression involving more than one operator. There are different levels of precedence from high to low. An operator belonging to a higher level is evaluated first.

Associativity: If two operators have the same precedence (priority), then they are either evaluated from "Left to Right" or from "Right to Left" based on their level. It is termed as associativity, which tells the direction of execution of operators ("Left to Right" or "Right to Left") when operators in an expression have the same precedence.

Operator	Description
( )	Parenthesis
**	Exponentiation
+ a, –a	+ Unary , – Unary
*, /, //, %	Multiplication, Division, Floor Division, Modulus (Remainder)
+, –	Binary addition and subtraction
< , <=, >, >=, = =, !=	Relational operators
not and or	Boolean / Logical operators

Operator Precedence

Let's Know More

The precedence of an operator tells the compiler the order in which the operators should be evaluated.

Higher precedence operators are operated before the lower precedence operators. When an expression contains operators, which have the same precedence (like * and /), then whichever operator comes first is evaluated first.

Examples:

Evaluate the following expressions:

12 + 3 * 4 – 6 / 2	(12 + 3) * 4 – 6 / 2	12 + 3 * (4 – 6) / 2
Solution	Solution	Solution
= 12 + 12 – 6 / 2	= 15 * 4 – 6 / 2	= 12 + 3 * (–2) / 2
= 12 + 12 – 3.0	= 60 – 6 / 2	= 12 + (–6) / 2
= 24 – 3.0	= 60 – 3.0	= 12 – 3.0
= 21.0	= 57.0	= 9.0

⏩ CONDITIONAL STATEMENTS IN PYTHON

In the previous chapter, you have learnt about the basic elements of Python. In this chapter, you will be introduced to the concept of **Conditional Branching** and the various control statements available in Python.

In our day-to-day life, we come across various situations where we have to take decisions and take actions accordingly.

Let us take a simple real-life example. It is rainy season and you want to go out and play with your friends. Before you move out to play, you want to be sure that the weather will remain clear throughout the day or not. In this case, first you will check:

CONDITION	PLAN OF ACTION
If the weather is clear	Then you will go out and call your friends to play.
If it is raining	You will sit at home and enjoy watching television or probably read a story book.

Let us take another example. You need to have a valid driving license for driving any vehicle. To apply for a driving license, your age should be greater than or equal to 18.

CONDITION	PLAN OF ACTION
If your age is greater than or equal to 18	Then you are eligible to apply for a driving license.
If your age is less than 18	Then you are not eligible to apply for a driving license.

As you have already studied about algorithm and flowchart, let us analyse the above example with the help of an algorithm and a flowchart.

⏩ ALGORITHM

An **Algorithm** is a well-defined step-by-step procedure to solve a problem. It helps us to understand the problem and its solution in a better way.

Algorithm to apply for a driving license:

1. Input your age.

2. Check your age. If your age is greater than 18, then you can apply for the license.

3. If it is less than 18, then you are not eligible to apply for a driving license.

Let us draw a flowchart for this example.

➤ FLOWCHART

It is a pictorial representation of the flow of steps to solve a problem.

Flowchart to check whether you can apply for a driving license or not.
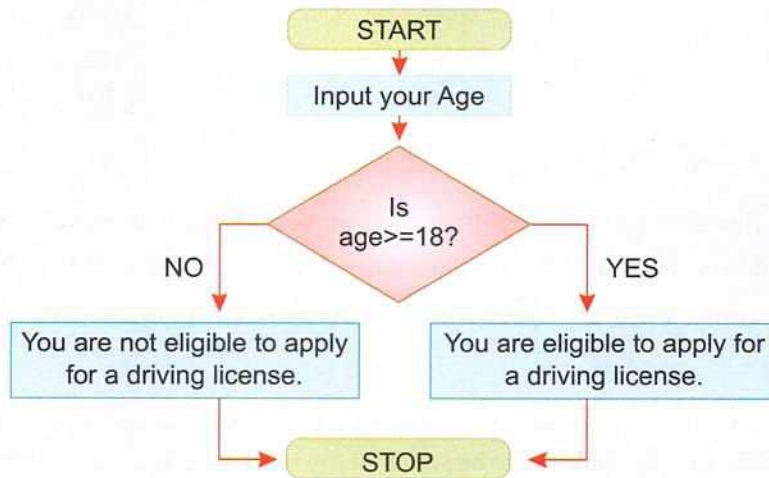
Figure 6.9: Flowchart

In a computer program, statements are generally executed in a sequential manner. However, at times, the user may need to change this order of execution by repeating or skipping the execution of a few statements, subject to a given condition. In such a situation, the flow of execution is altered by the use of **Control Statements.**

Before proceeding further, we must understand the different types of **constructs/statements** in programming that govern the flow of the control of a program.

➤ TYPES OF CONTROL STRUCTURES

SEQUENTIAL STATEMENTS

In Sequential construct, the statements in a program are executed in a sequential manner, where one statement is followed by the other, with no possibility of branching off to another action.

Program 9: To calculate the area of a rectangle, first, enter the length and breadth of the rectangle, then calculate its area and print the result.

Figure 6.10: Program on Area of Rectangle

Output

CONDITIONAL STATEMENTS

In programming languages, conditional statements cause the program control to transfer to a specific location depending on the outcome of the conditional expression. Every decision involves a choice between the two

alternatives **'Yes'** and **'No'** result. If a conditional statement is **true,** then one set of statements is executed, otherwise, the other set of statements is executed.

ITERATIVE STATEMENTS

These statements enable the execution of a set of statements to be repeated till the condition is true. As soon as the condition becomes false, the control comes out of the loop and the repetition stops.

⟩ CONDITIONAL STATEMENTS

Before you start writing programs based on conditions, it is important to understand how conditional programming works. In conditional programming, the most important element is the **condition** on which the decision is based. The conditional statements check the condition and execute the statements accordingly. The **conditional** statements can be represented in many forms:

if STATEMENT

The **if** statement is used when we have to evaluate only one condition. It performs a course of action if the condition evaluates to **true,** otherwise it skips the statements if the condition evaluates to **false.**

For example, your parents allow you to go out for playing only if you complete your homework.

Syntax:

if <condition>:

    Statement 1

    Statement 2

    ....

Remember, that after the **if** condition there is a **colon** and the condition body starts with an indentation of tab space. It is mandatory in Python to indent the statements in the condition body else it will display an error.

Let us understand this through a Python program:

Program 10:
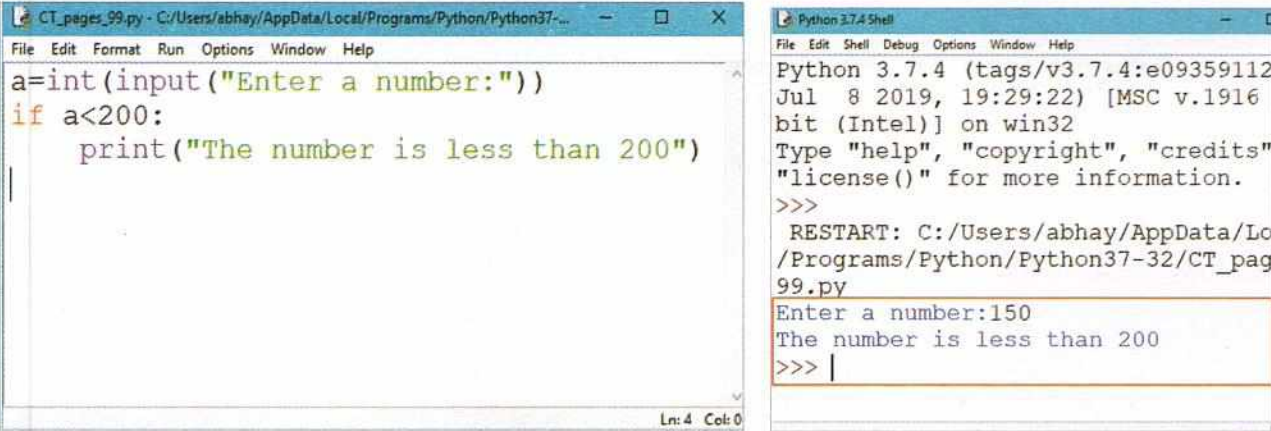
| **Figure 6.11: Program Displaying the use of If Condition** | **Output** |
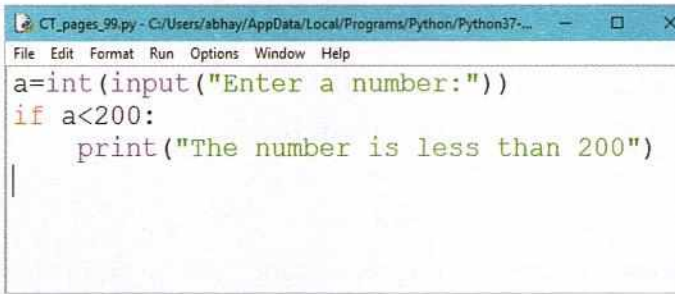
So, in the above example, if we enter a number less than 200, it shows us the output "The number is less than 200".

But, what will happen if we enter a number greater than 200? No output will be displayed because we have not given any statement or instruction to be followed if the given condition is **false.**
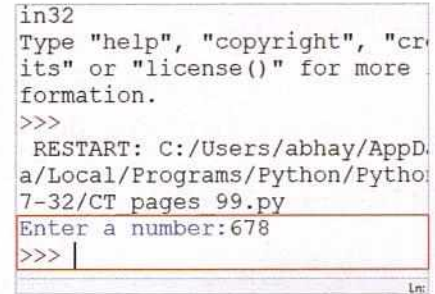
This is demonstrated in the following example:

Program 11:

Figure 6.12: Program Displaying the Use of If Condition · Output

Here, nothing is displayed when you enter a number greater than 200.

if...else STATEMENT

The **if... else** control structure is used when either of the two different actions is to be performed depending upon the result of the conditional expression. It contains two blocks of statements. In case the conditional expression evaluates to **true,** the statements in the 'if' block are executed, and if the result is **false,** then the statements in the 'else' block get executed.

For example, you can go out to play **if** it doesn't rain **else** you have to play indoor games.

Syntax:

if:

　　Statements Set1

else:

　　Statements Set2

Program 12:

Figure 6.13: Program Displaying the Use of if-else Statement · Output

In this example, when you enter a number less than 200, the first part, i.e., the 'if' part is executed and you get the output, "The number is less than 200".

When you enter a number greater than 200, in this case, the statement following the 'else' part is executed and displays the output, "The number is greater than 200".

Program 13: Create a program in Python to enter a number and check if the number is a positive or a negative.


```
num=int(input("Enter a number:"))
if num<0:
    print("Number is a negative number")
else:
    print("Number is a positive number")
```

Figure 6.14: Use of if...else Statement

Output

Output

PRACTICE TIME

1. Create a program to input name of the month. Based on this input, the program should display the number of a days in a month, i.e, January-31 Days, February-28 Days, etc.

2. Create a program to input the runs scored by a batsman in a match. Based on the scored runs by the batsman, the program should display a message whether a batsman has scored a century or not.

if...elif...else STATEMENT

Sometimes, we need to work with multiple conditions. In this case, only using **if-else** construct does not serve the purpose. The **if... elif... else** statements provide a compact way to perform multiple tests on a condition.

For example, when you visit a bank, you go to the counter according to the service you want to avail. If you want to deposit cash, you go to counter 1, if you want to enquire about the cheque, you go to counter 2, if you have to enquire for a savings plan, you go to counter 3, and so on.

Syntax:
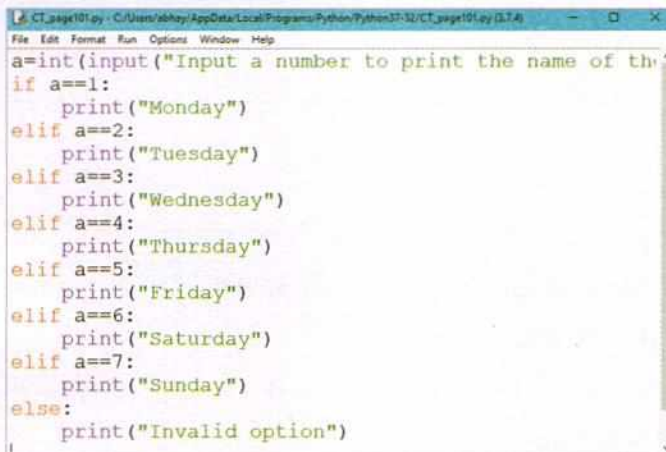
```
if <condition1>:
    statement set 1
elif <condition 2>:
    statement set 2
else:
    statement set 3
```

We can also have the following syntax:
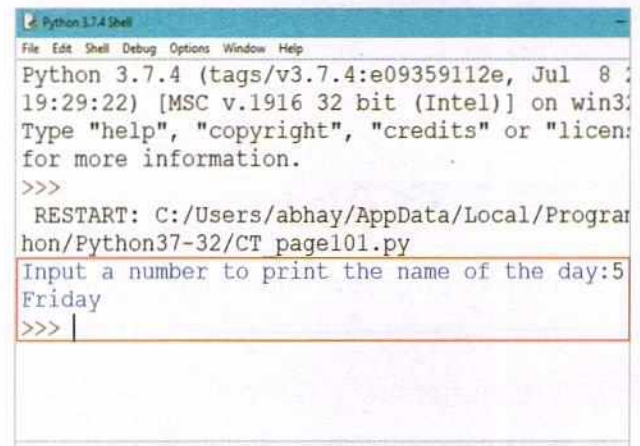
Syntax:

```
if <condition1>:
    statement set 1
elif <condition 2>:
    statement set 2
elif <condition 3>:
    statement set 3
elif <condition 4>:
    statement set 4
else:
    statement set 5
```

Program 14: Write a program to display the name of the day according to the number given by the user.


```
a=int(input("Input a number to print the name of the
if a==1:
    print("Monday")
elif a==2:
    print("Tuesday")
elif a==3:
    print("Wednesday")
elif a==4:
    print("Thursday")
elif a==5:
    print("Friday")
elif a==6:
    print("Saturday")
elif a==7:
    print("Sunday")
else:
    print("Invalid option")
```

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8
19:29:22) [MSC v.1916 32 bit (Intel)] on win3
Type "help", "copyright", "credits" or "licen:
for more information.
>>>
 RESTART: C:/Users/abhay/AppData/Local/Progra
hon/Python37-32/CT_page101.py
Input a number to print the name of the day:5
Friday
>>>
```

Figure 6.15: Program Displaying the Use of if-elif-else Statement   **Output**
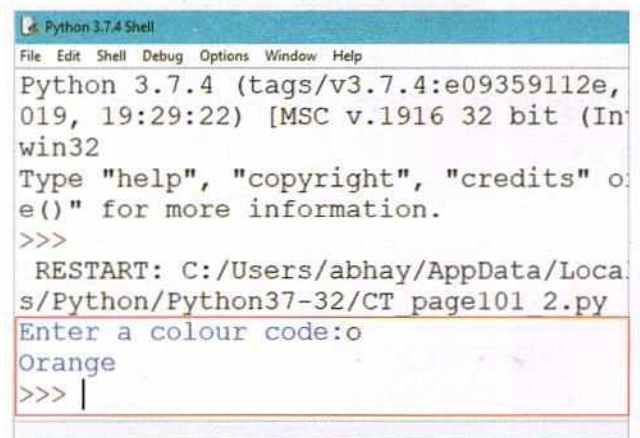
Hence, from the above example, it is clear that we can add multiple conditions in a program using conditional constructs.

Program 15: Create a program in Python to display the name of a colour on the basis of corresponding colour code.


```
code=input("Enter a colour code:")
if code=='v':
    print("Violet")
elif code=='i':
    print("Indigo")
elif code=='b':
    print("Blue")
elif code=='g':
    print("Green")
elif code=='y':
    print("Yellow")
elif code=='o':
    print("Orange")
elif code=='r':
    print("Red")
else:
    print("Invalid colour code")
```

```
Python 3.7.4 (tags/v3.7.4:e09359112e,
019, 19:29:22) [MSC v.1916 32 bit (In
win32
Type "help", "copyright", "credits" o:
e()" for more information.
>>>
 RESTART: C:/Users/abhay/AppData/Loca:
s/Python/Python37-32/CT_page101 2.py
Enter a colour code:o
Orange
>>>
```

Figure 6.16: Displaying Colour Name   **Output**

1. ABC Company is offering discounts on purchase of various electronic goods. At the payment counter, the operator is required to input the item code to get the details of the discount on the purchased items.

ITEM	CODE	DISCOUNT
Refrigerator	100	10%
Smart TV	101	15%
Micro Wave Oven	102	5%
Laptop	104	12%

Create a program which will display the total discount availed by a user based on item purchased.

RECAP

➤ Operators are symbols that perform arithmetic and logical operations on operands and provide a meaningful result.

➤ Arithmetic operators are used to perform mathematical operations.

➤ String operators work on the strings.

➤ The concatenation operator is used to join two strings and is represented by a '+' sign, while replication operator is used to repeat the printing of a string specified number of times and is represented by the '*' sign.

➤ Assignment operator (=) is used to assign the value of an expression to a variable.

➤ Relational operators are used to compare the values or expressions.

➤ Logical operators work on the statements to set the relation between them.

➤ The order in which the operators are evaluated is called precedence of operators.

➤ An algorithm is a well-defined step-by-step procedure to solve a program.

➤ A flowchart is a pictorial representation of the flow of steps to solve a problem.

➤ In programming languages, conditional statements cause the program control to transfer to a specific location depending on the outcome of the conditional expression.

➤ The **if** statement is used when we have to evaluate only one condition.

➤ The **if...else** control structure is used when either of the two different actions are to be performed depending upon the result of the conditional expression.

➤ The **if... elif... else** statements provide a compact way to perform multiple tests on a condition.

SECTION - A

A. Fill in the blanks.

1. The order in which the operators are evaluated is called .... of operators.

2. The valid combination of both operands and operators makes an ...., which returns a computed result.

3. .... operator is used to concatenate or join two or more strings.

4. In Python, the flow of execution is altered by the use of .... statements.

5. The .... control structure is used when either of the two different actions is to be performed depending upon the result of the conditional expression.

6. In Python, the conditional statement is terminated with a .... symbol.

HINTS • '+'   • if else   • Precedence   • Colon   • Control   • Expression

B. State True or False.

1. An operator does not need any operand to perform any operations.

2. Unary operators can be used on more than three operands.

3. Exponential operator is used to calculate the power of numbers.

4. Higher precedence operators are operated before the lower precedence operators.

5. 'if-elif-else' statements are used when we have to evaluate only one condition.

6. Iterative statements enable the execution of a set of statements to repeat till the condition is true.

C. Application-based questions.

1. Sumit is converting a decimal number to a binary number. He needs to calculate the remainder in each step. Which operator do you suggest him to use for this task?

   ....

2. Arif's father is a businessman. He wants to determine whether he made a profit or loss based on the revenue figures. Suggest an appropriate conditional construct he can use to solve the problem.

   ....

SECTION - B

D. Multiple-choice questions.

1. The values on which the operators work are known as ....

   a. Operands   b. Operating system   c. Data   d. Numbers

2. // (floor division) is same as / (division).

   a. True   b. False   c. In some cases, yes   d. None of these

3. In which construct the statements in a program are executed in a sequential manner followed by one after the other with no possibility of branching off to another action.

   a. Conditional   b. Sequential   c. Iterative   d. None of these

4. Which statement among the following enables the execution of a statement to repeat till the condition is true.

   a. Conditional   b. Sequential   c. Iterative   d. None of these

5. If in a conditional expression, the condition evaluates to false, then which block of statements will be executed first?

   a. else   b. if   c. both a and b   d. None of these

E. Name the following.

1. Two types of arithmetic operators   ....

2. Three types of logical operators   ....

3. Two operators used in strings   ....

4. The statement which is used to evaluate only one condition   ....

5. The procedure to write the steps of a program in a well defined way   ....

F. Answer the following questions briefly.

1. What do you mean by the term operator?

   ....

   ....

2. What is the difference between '/' and '//' operator?

   ....

   ....

3. What is the use of '*' operator in a string manipulation?

   ....

   ....

4. What are the different types of control structures?

   ....

   ....

ACTIVITY SECTION

MY ACTIVITY — Learning While Playing

1. **Write the output for the following code of statements.**

   a. ```
   a=10
   b=20
   print(a>10 and b<40)
   ```

   b. ```
   a=10
   b=20
   print(a+b)
   print('a+b')
   ```

   c. ```
   a=100
   if a>99:
       print(a, 'is a three digit number')
   else:
       print(a, 'is a two digit number')
   ```

   d. ```
   a=4
   if a%2==0:
       print(a,'is even number')
   else:
       print(a,'is odd number')
   ```

2. **Rewrite the programs after correcting the errors in the given box.**

   a. ```
   n=6
   If N%2 = 0:
   Print "n, is divisible by 2"
   ```

   b. ```
   a=10, b= 20
   Sum = a + b
   Print(Sum of numbers is +sum))
   ```

   c. ```
   num1=50
   Num2=60
   If Num1 < Num2
   Print num1 is smaller than Num2
   Else
   Print Num2 , is greater than Num1
   ```

1. Write the code for the following programs using Script Mode.

    a. Using the String Replication operator print your name 10 times.

    b. Input two numbers and design a program which can perform the following functions:

        i.    Add the numbers.

        ii.   Subtract the numbers.

        iii.  Find the remainder when one number is divided by the other.

        iv.   Find the quotient when normal division is performed.

        v.    Find the quotient when integer division is performed.

        vi.   Multiply the numbers.

    c. Input the name, age, and basic salary of an employee. Calculate the total salary of an employee by adding 10% DA and 10% HRA to the basic salary.

2. Create a program in Python to find if a year is a leap year or not. A year is a leap year if it is divisible by 4.

3. Write a program to display "Valid Voter" if the following condition is true: Age of the person should be >=18.

**GROUP DISCUSSION**          **For Concept Clarity**

Conduct a group discussion in the class on the given topics:

➤ **Different Types of Operators**

➤ **Sequential Statements and Iterative Statements**

**PROJECT WORK**          **Using Creativity**

Input the name, age, and basic salary of an employee. Calculate the total salary of the employee as per the given conditions.

| Age | HRA | DA |
| --- | --- | --- |
| age <40 | HRA 5% | DA 10% |
| age between 40 to 50 | HRA 7% | DA 12% |

**ONLINE LINKS**          **Looking For More**

To know more about programming in Python, visit the following links:

➤ https://www.tutorialspoint.com/python/python_basic_operators.htm

➤ https://www.programiz.com/python-programming/operators

# INTRODUCTION TO HTML 5

## LEARNING IN THIS CHAPTER

- What is HTML and its brief history
- Tools to be used
- Creating an HTML document
- Tags, Elements & Attributes
- HTML document structure
- Common HTML Elements
- Cascading Style Sheets
- Methods of applying CSS
- Background properties

Internet, an emerging technology, has become a vital part of our life. It is the largest information base and has revolutionised the world economy as well as the society. The internet is a network of millions of computers, which are connected with each other to share information and resources. Computers on the internet are either Servers or Clients and communicate via networking protocol. The clients send requests to the servers and the servers respond immediately with the required data.

The servers store files and information in the form of websites. These websites consist of millions of pages called web pages, which contain, text, graphic, video, audio, and link to the other pages called Hyperlink. These web pages can be accessed by different users around the world by using an internet connection. Have you ever wondered how these web pages are created? Which language is used to write these web pages? The answer is: HTML. HTML is the most widely used language to design web contents for the internet. In this chapter, you will be introduced to the basics of this technology.

## WHAT IS HTML?

HTML stands for Hypertext Mark-up language. It is a complete code package that allows the user to create web pages that contain both text and graphics. It is a simple mark-up language that describes the structure and behaviour of the web document. All the web browsers are designed to understand and interpret this language.

Let us analyse the acronym HTML.

### HYPERTEXT

Hypertext is a piece of ordinary text that has been spruced up with a special feature of linking to other documents or webpages. So, when you click on the hypertext, it opens a new web page.

### MARKUP LANGUAGE

It is a language that uses special symbols called 'Tags' to mark-up a text document that instructs the browser how to display the text. Mark-up languages are solely concerned with classifying the parts of a document according to their functions like, indicating which part is the title of the document, which part is heading or subheading, and so on.

Originally, HTML was developed with the intent of defining the structure of documents to facilitate the sharing of scientific information between researchers. Now, it is being widely used to format web pages with the help of different tags.

## BRIEF HISTORY OF HTML

HTML started its journey in the early 1980s with General Markup Language (GML). In 1986, this language was modified and standardised and named Standard General Markup Language (SGML). In 1989, Tim Berners-Lee and his team re-designed this language and named it as HTML. The standard version of it came into existence in 1995, when HTML 2.0 version was announced. Later on, after two years HTML 3.0 and then after two years HTML 4.0 was announced. HTML5 came into existence around 2008. The two major organisations that were involved in developing HTML5 were World Wide Web Consortium (W3C) and Web Hypertext Application Technology Working Group (WHATWG).

In this chapter, you will learn about the basics of HTML5.

**HTML 5** is the latest version of HTML. It is a mark-up language using which you can create a web page in an easy and convenient way. Now, adding audio and video clips in the web page is as easy as including images, which was not possible in the earlier versions without the support of external software or plug-ins like Flash Player. With the CANVAS feature, you can also draw images directly in the web page. All these attributes of this new version have added relevance and credibility to it.

## TOOLS TO BE USED

We require two basic tools to work with HTML documents:

➤ HTML Editor – for creating and saving the documents

➤ Browser – for viewing the documents

### HTML EDITOR

There are mainly two types of HTML editors.

### WYSIWYG Editor

WYSIWYG stands for What You See Is What You Get. This type of web editor allows a developer to see what the end result will look like while the document is being created. These editors provide various tools and graphical interfaces where the web pages are designed. While using a WYSIWYG editor, users may not require the knowledge of HTML commands as the elements (images, tables, lists, etc.) can be placed on the interface and the required HTML code will be added automatically.

**For example:** Adobe Dreamweaver, Amaya, Google Web Designer

### Text Editor

You can also create HTML documents using normal text editors like Notepad or WordPad. Unlike WYSIWYG editors, here, one is required to have proper knowledge of HTML commands to develop web pages.

### BROWSER

Web browsers are used to view the HTML documents. Some commonly used web browsers are:

| | Google Chrome | | | Apple Safari |
|---|---|---|---|---|
| | Internet Explorer | | | Mozilla Firefox |
| | Microsoft Edge | | | Opera |

## CREATING AN HTML DOCUMENT

To create HTML documents, you will use NotePad. Let us discuss how to create HTML document using Notepad.

➤ Open Notepad by clicking on **Start > Windows Accessories > Notepad**.

➤ The Notepad window will appear.

➤ Type the HTML code as shown in Figure.

```
My first Program - Notepad          —    □    ×
File  Edit  Format  View  Help
<html>
<head>
<title>
My First Program
</title>
</head>
<body>
This is my first HTML program!!!!!
</body>
</html>
```

➤ Click on the **File > Save** option. The **Save As** dialog box will appear. Select the target folder to save the file and mention the name in **File name** text box with an extension **.html**.

➤ Click on the **Save** button.

VIEWING AN HTML DOCUMENT

Here, Google Chrome is being used.

Unlike other browsers (Internet Explorer, Mozilla Firefox), Google Chrome does not have menu bar. So, to open an HTML file, either you can opt for keyboard shortcut, i.e., **Ctrl + O** or follow the given steps:

➤ Enter the letter for the drive, in which your HTML file is present, in the address bar of Google Chrome. In our case, it is C:.

➤ Press Enter key. The directories and files on that particular drive (C: in our case) will be displayed as links in the Chrome window.

> Now, navigate to the directory that contains the HTML file you want to open by clicking the links.

> Click on the HTML file, once you find it in the list. The file will be displayed in the Chrome window.

TAGS, ELEMENTS, AND ATTRIBUTES

HTML code is made up of elements, tags, and attributes.

TAGS

Tags are the building blocks of a web page. They contain elements that define how the information on a web page is formatted or displayed. You can also include non-text items such as images, links, and lists on the web page using the text. Tags do not appear in the browser window but they affect the display of the text and non-text items in it. Each tag in HTML follows specific rules and syntax. These tags are not case sensitive, for example, <tag name> and <TAG NAME> will have the same effect.

The HTML tags or commands are inserted before and after the text. Each tag, giving a specific instruction, begins with a less than sign '<' and ends with a greater than sign '>'.

For example, the tag for defining a paragraph is <p>.

You use <p> before the block of text that you want to designate as a paragraph. This is the opening tag or the ON tag. At the end of the text block, you place </p>. This is the closing tag or the OFF tag. So, to define a paragraph, you will type the following in the text editor;

SYNTAX: <p> some text</p>

on tag   off tag

ELEMENTS

An HTML element consists of an ON tag, the content, and an OFF tag.

The HTML elements can be categorised as:

> Container Elements   > Empty Elements

Container Elements

The elements that include both ON and OFF tags are called Container Elements.

For example, This makes the text bold

Empty Elements

Empty elements contain only ON tags. They do not have OFF tags. These elements do not enclose any data; instead they do some function on their own.

For example, <br> tag (It breaks the line and displays the text from the next line.)

ATTRIBUTE

An **Attribute** is the property that provides additional information about an HTML element. It enhances the functionality of a tag. An attribute is always specified inside the opening tag. All attributes consist of two parts – a name and a value. The 'name' is the property that you want to set and the 'value' is what you want for the respective property. Attribute value is always enclosed within quotes. We can use more than one attribute inside a tag.

For example, the **width** attribute of the <hr> tag specifies the width of the horizontal line in pixels or percentage. By default, the width of the horizontal rule is 100%.

So if we write <hr width=50%>, the horizontal line will cover only 50% of the page.

⟫ RULES FOR WRITING HTML CODE

➤ Tags and attribute names are not case-sensitive, so <Head>, and <head> have the same meaning. However, using lower case is recommended.

➤ Container tags should always be closed because an unclosed tag can lead to undesired results.

➤ Values given to the attributes should be enclosed within quotes especially if the value contains any blank space.

➤ Attribute values can be case sensitive.

➤ When the tags are embedded, i.e., when you start a tag within another tag, you need to close the inner tag before closing the outer tag.

> **For example:** <p> Hello </p> ◄ Incorrect
>
> <p> Hello </p> ◄ Correct

➤ Tag names should not contain spaces. For example, writing <body> as <b o d y> is incorrect.

➤ There should be no space between '<' and '>' in a tag.

⟫ HTML DOCUMENT STRUCTURE

The general structure of an HTML document has two sections: Head and Body.

HEAD SECTION

The Head section provides general information about the document, e.g., the **Title** defines a title for the page on the browser's Title bar.

BODY SECTION

The body section contains the text that gets displayed on the web page along with the other tags and attributes. It includes text, graphics, and the other HTML elements that provide control and formatting to a page, like fonts, paragraph, list, and other elements. Let us discuss the basic structure of an HTML document.

➤ The HTML document starts with <html> tag and ends with </html> tag. Everything is written within these tags. If the commands are not enclosed in tags then a web browser will assume the commands as text.

➤ The <head> tag is the HTML document header. It lies just below the <html> tag. It contains information that is important about the web page, but you cannot see it in the browser window. The <head> contains no text within itself.

➤ The <title> tag is to be given within the <head> tag. It contains the title of the document. The title is displayed on the **title bar** at the top of the browser window and not inside the window itself. The title should be short and include less than 64 characters.

➤ The <body> tag contains the contents of your document that gets displayed on the web page in your browser window. In the <body> tag, you use number of formatting elements, images, heading, list, and hypertext links to enhance the appearance of a web page.

There are two basic categories of HTML elements used in the body tag:

   ➤ Block-level elements   ➤ Text-level elements

A Block-level elements take up the full width available and by default begin on a new line. These elements include tags like:

➤ Paragraph <p>

➤ Heading <h1>

➤ Horizontal rule <hr>

➤ Centering <center>

Text level elements are used to mark-up bits of text. They do not start on a new line and only take up as much width as necessary. These include tags like:

➤ Bold <b>

➤ Italics <i>

➤ Line break

```
<html>
    <head>
        <title>
        Title of the web page
        </title>
    </head>
    <body>
    Text, which you want to
    show on your web page <br>
    will be given here.
    </body>
</html>
```


Title of the web page

Head

Text, which you want to show on your web page will be given here.

Body

In the coming section, we will discuss some of the common **HTML elements** that are used frequently in an HTML document.

HEADING

This tag is used to define different heading levels in an HTML document. It is basically used to emphasise the text. There are six heading levels, H1 to H6. The H1 heading style displays the text in the largest size and is mainly used for main headings. The lower levels are used for sub headings and less important things. It is not essential to use these heading levels in hierarchy. These heading tags are written within the <body> tag of the document.

```
<html>
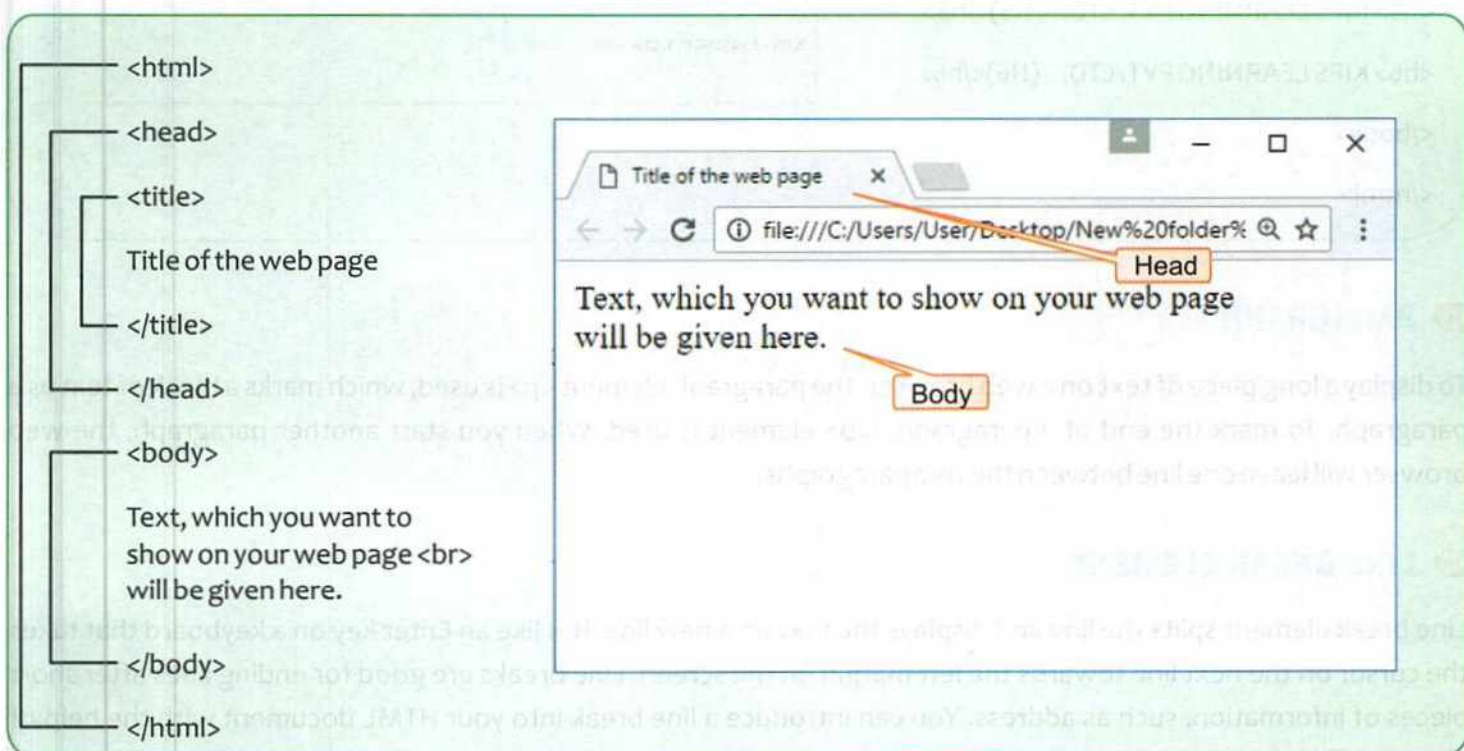
<head>

<title> Using Heading Styles</title>

</head><body>

<h1> KIPS LEARNING PVT. LTD. -(H1)</h1>

<h2> KIPS LEARNING PVT. LTD.-(H2)</h2>

<h3> KIPS LEARNING PVT. LTD. -(H3)</h3>

<h4> KIPS LEARNING PVT. LTD. -(H4)</h4>

<h5> KIPS LEARNING PVT. LTD. -(H5)</h5>

<h6> KIPS LEARNING PVT. LTD. -(H6)</h6>

</body>
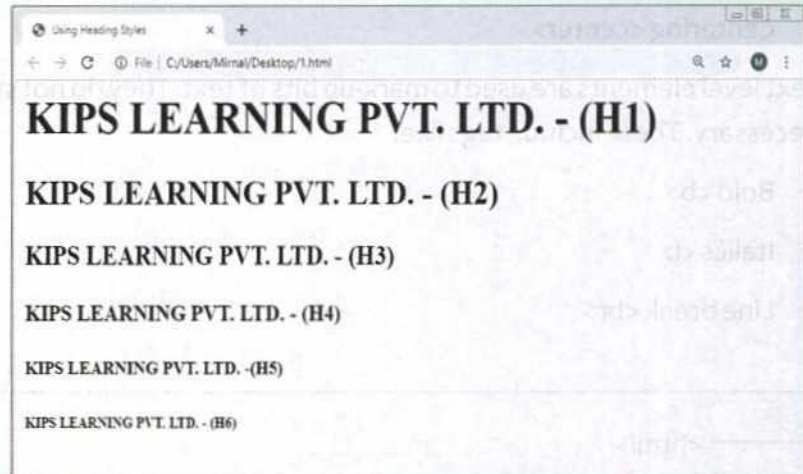
</html>
```

KIPS LEARNING PVT. LTD. - (H1)

KIPS LEARNING PVT. LTD. - (H2)

KIPS LEARNING PVT. LTD. - (H3)

KIPS LEARNING PVT. LTD. - (H4)

KIPS LEARNING PVT. LTD. -(H5)

KIPS LEARNING PVT. LTD. - (H6)

PARAGRAPH

To display a long piece of text on a web browser, the paragraph element <p> is used, which marks a block of text as a paragraph. To mark the end of a paragraph, </p> element is used. When you start another paragraph, the web browser will leave one line between the two paragraphs.

LINE BREAK ELEMENT

Line break element splits the line and displays the text on a new line. It is like an Enter key on a keyboard that takes the cursor on the next line towards the left margin on the screen. Line breaks are good for ending lines after short pieces of information, such as address. You can introduce a line break into your HTML document with the help of <br> tag. This element has no end tag.

```
<html>

<head>

<title> Line break element </title>

</head>

<body>

Kips Learning Pvt. Ltd. <br>

B-40, Sector-57, <br>

Noida <br>

Pin-201305 <br>

Ph-8130100096

</body>
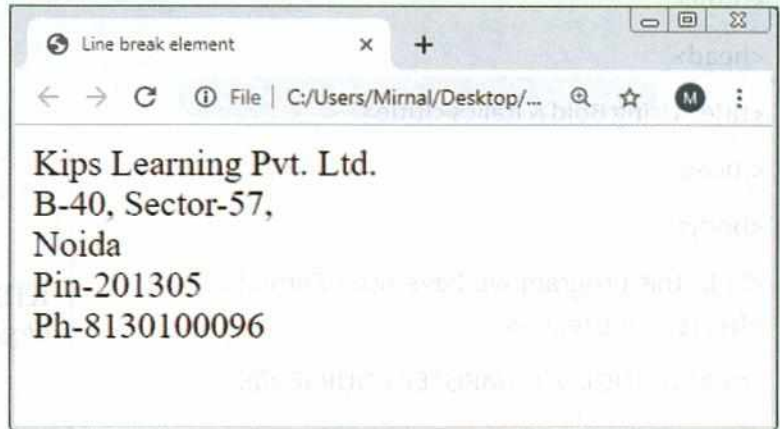
</html>
```


HORIZONTAL RULE

It is used as a separator between blocks of text. The <hr> element draws a horizontal line across the page. It is an empty element and has no end tag. Type <hr> where you want to insert a horizontal line in between the text.

COMMENT

So far you have seen that whatever you write inside body tag, it gets displayed in the web browser. Sometimes, you want to write notes for yourself in an HTML document, but do not want them to be displayed in the browser window. In such a case, you need to use the Comment tag. To comment the text use any of the following ways:

<!-- Learning HTML is great fun -->

Or

<comment> Learning HTML is great fun </comment>   (The comment tag works in Internet Explorer)

BOLD

The bold tag is used when you need to emphasise the text. Type before typing the text that you want to display as bold and type after the text.

For example: KIDS POOL- A COMPUTER COURSE

ITALICS

To draw the attention of a reader on any important information, Italics tag is used. This element marks up the text in Italic style. Type <i> tag before typing the text that you want to display in Italics and type </i> tag after the text.

For example: <i> Organised by: KIPS Learning Pvt. Ltd.</i>

```
<html>

<head>

<title> Using Bold & Italics </title>

</head>

<body>

<!-- In this program we have used Formatting
effects on the text.-->

<b> KIDS POOL - A COMPUTER COURSE </b>

<br>

<i> Organised by: KIPS Learning Pvt. Ltd.</i>

</body>
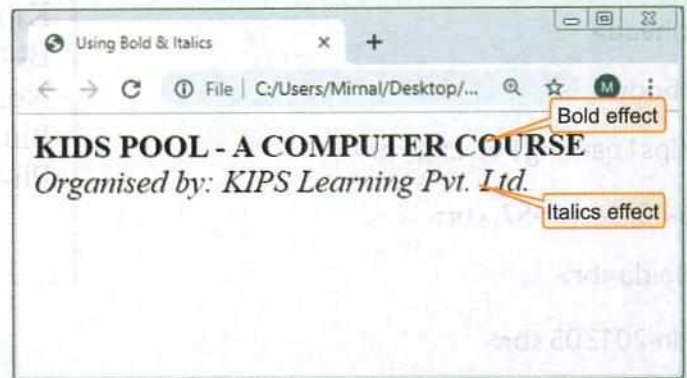
</html>
```

CASCADING STYLE SHEETS

CSS is a style sheet that provides a set of Style rules for defining the layout of HTML documents. Using CSS, you can control the colour of the text, the style of fonts, the spacing between paragraphs, size and layout of columns, background images as well as a variety of other effects. Style sheets are designed to separate the presentation style of documents from the content of documents. This makes site maintenance much easier and provides more flexibility.

The concrete benefits of CSS include:

➤ Control layout of many documents from one single style sheet (External Style Sheet)

➤ More precise control of layout

➤ Apply different layout to different media types (screen, print, etc.)

➤ More advanced options and sophisticated techniques

CSS TERMINOLOGY

Property

It defines how different elements look on the web page. Font-family, color, background, border and the like, all are examples of properties.

Value

This is the value or option chosen for a property.

For example: Value for the Font-family property can be font names like **Monotype Corsiva, Times, Arial,** etc.

Declaration

A property and its value is collectively known as Declaration.

For example : Color   :   Green

Property   Value

Selector

It is the name of the HTML element to which you want to apply the declaration.

For example: If you want to change the behaviour of hr element (let us say its width should be 50%) then you would use **hr** as your selector.

Rule

Selector and declaration together form a Rule.

Declaration   Property   Value

H1 { Color : blue; font-size: 20 px;} → Rule

Example

Property   Value   Declaration

Selector

METHODS OF APPLYING CSS

You can include the style sheet rules with an HTML document in the following given ways.

IN-LINE (THE ATTRIBUTE STYLE)

One way to apply CSS to HTML elements is by using the 'Style' attribute. The Style attribute can be used with any element in the body section including the <body> tag itself. You can use any number of declarations; each one separated by a semicolon.

For example: <hr style = "width:50%; height : 100;

background-color: blue">

This is not an efficient use of style sheet as the declaration is to be repeated with every element, even if the same style is applied on some other element in a document.

INTERNAL OR EMBEDDED STYLE SHEET

This style has wider scope than the In-line method. With In-line method, the effects applied are limited to the element with which the style declaration has been specified, whereas in Embedded style, the effects get applied to all the elements of the type with which the style declaration has been specified.

To create an embedded style sheet, you make use of <Style> tag in the Head section.

```
<html>                                            </head>
<head>                                            <body>
<style>                                           <hr>
hr{width:50%;height:5%;background-color:blue;}    </body>
</style>                                           </html>
```

EXTERNAL STYLE SHEET

In this method, you define the style rules separately in one file and then use it with any HTML document. An external style sheet is simply a text file with an extension **.css**. Like any other file, you can place the style sheet with its name, like style.css on your web server or hard disk.

This method incorporates two files. One file contains the style code only and the other file contains the HTML code.

Let us use the Style Sheets to set the various properties of body background. You will use Embedded style sheets in this chapter.

⋙ BACKGROUND PROPERTIES

HTML allows you to set the background style of an element with the help of the following properties:

Color   Image   Repeat   Position   Attachment

BACKGROUND COLOR

This property is used to set the background colour of the HTML element.

SYNTAX: background-color : value

         where value = color/RGB color code

```
<html>
<head>
<title> Using Background Color Property </title>
<style type = "text/css">
body {background-color : yellow}                  Selector
                                                  Property        Value
</style>
</head>
<body>
Using background color property and changing background colour.
</body> </html>
```


Using background-color property and changing body background.

BACKGROUND IMAGE

With this property, you can add an image in the background of an HTML document.

SYNTAX: background-image : value

         where value = url (path of the image)

```
<html>
<head>
<style type = "text/css">
body{background-image:url("C:/Users/User/Desktop/Html/Teamwork.png")}
</style>
```

```
</head>
<body>
<p> Teamwork is so important that it is virtually impossible
for a person to reach the heights of his capabilities or
make the money that he wants without becoming very good at it.
</p>
</body>
</html>
```

Background Image Repeated

BACKGROUND POSITION

This property helps us in placing the picture or image at a desired place on the HTML document. By default, an image is placed at the top-left corner of the element.

SYNTAX: background-position: value

where value = xpos ypos|x% y%| [top|center|bottom]||[left|center|right]

➤ **xpos ypos** – specifies the horizontal, vertical position respectively in units of length

➤ **x% y%** – horizontal & vertical position in percentage

➤ **[top|center|bottom]||[left|center|right]** – These keywords also specify the vertical & horizontal position values respectively. Values are to be chosen in conjunction from both the sets specified above.

BACKGROUND REPEAT

With the help of this property, you can set the repetition pattern for the background image. By default, a background image is repeated in both horizontal and vertical directions.

SYNTAX: background-repeat: value

where value = no- repeat|repeat-x|repeat-y|repeat

➤ **no repeat** – image will not be repeated

➤ **repeat-x** – image will be repeated horizontally

➤ **repeat-y** – image will be repeated vertically

➤ **repeat** – default value, image will be repeated in both the directions.

BACKGROUND ATTACHMENT

This property helps in either fixing the image in the background or make it scroll when the user scrolls the rest of the page.

SYNTAX: background-attachment: value

where value = fixed|scroll

Let's Know More

Colour			
black	■	white	□
red	■	blue	■
yellow	□	fuchsia	■
maroon	■	olive	■
grey	■	purple	■
lime	■	green	■
aqua	□	navy	■
orange	■	teal	■
silver	□	tan	■
dodgerblue	■	firebrick	■
peachpuff	□	aquamarine	■

RGB Codes		
Maroon	rgb(128, 0, 0)	■
Forestgreen	rgb(34, 139, 34)	■
Aqua	rgb(0, 255, 255)	□
Crimson	rgb(220, 20, 60)	■
Blueviolet	rgb(138, 43, 226)	■
Gold	rgb(255, 215, 0)	□
Pink	rgb(255, 192, 203)	□
Peachpuff	rgb(255, 218, 185)	□

Hexadecimal Codes			
#800000	■	#00ff00	■
#ff0000	■	#008000	■
#ffA500	■	#000080	■
#ffff00	□	#0000ff	■
#808000	■	#00ffff	□
#800080	■	#008080	■
#ff00ff	■	#000000	■
#ffffff	□	#c0c0c0	■
#808080	■		

```
<html>
<title>background properties</title>
<head>
<style type="text/css">
body{background-image:url("C:/Users/User/Desktop/Html/flower.jpg");background-position:topcenter;
background-repeat:no-repeat;background-attachment:fixed}
</style>
</head>
<body>
Background properties related to image
</body>
</html>
```

Because of **background-repeat: no-repeat**, the image is not repeated

RECAP

> HTML is the most widely used language to design web contents for the internet.
> Internet is a network of millions of computers, which are connected to each other to share information and resources.
> Two basic tools are required to work with HTML documents:
>   > HTML Editor for creating and saving the documents
>   > Browser for viewing the documents
> HTML code is made up of elements, tags, and attributes
> HTML elements are of two types
>   > Container elements that include both ON and OFF tag
>   > Empty elements that contain only ON tag
> The general structure of an HTML document has two sections
>   > Head section : It contains the title that identifies the first part of an HTML document
>   > Body section : This is the section where you do most of the work
> CSS is a style sheet that provides the set of style rules for defining the layout of HTML documents
> You can include the style sheet with an HTML document in three ways:
>   > In-line method
>   > Internal or embedded Style Sheet method
>   > External Style Sheet method
> HTML allows you to set the background style of an element with the background properties.

SECTION - A

A. Fill in the blanks.

1. .... is a piece of ordinary text that has been spruced up with special feature of linking to other documents or web pages.

2. .... are used to view the HTML documents.

3. In HTML5, ... feature helps in drawing images directly in the web page.

4. .... elements include both ON and OFF tags.

5. .... element splits the line and displays the text on a new line.

| HINTS | ● Canvas | ● Hypertext | ● Line Break | ● Web browsers | ● Container |

B. State True or False.

1. HTML 5 came into existence around 2008.

2. Tags and attribute names are case-sensitive.

3. Property defines how different elements look on the web page.

4. With the In-line method, the effects get applied to all the elements of the web page.

5. You can add an image in the background of a web page with the help of picture tag.

C. Application-based questions.

1. Rashmi wants to set the image of a zoo as the background of her web page but she is unable to do it. Help her do so.

....

2. Ramit wants to place the logo of his school on the top left corner of the web page. How can he do so?

....

SECTION - B

A. Multiple-choice questions.

1. HTML is an improved version of ....

   a. XML   b. SGML   c. SML

2. Amaya is a ....
   a. Text editor   b. Web editor   c. Word editor

3. The .... tag draws a horizontal line across the web page.
   a.
          b. <hr>   c. <line>

4. .... provides the set of style rules for defining the layout of HTML documents.
   a. CSS   b. WSS   c. TSS

5. A Property and its value is collectively known as ....
   a. Selector   b. Attribute   c. Declaration

6. The .... helps us in placing the picture or image at a desired place on the HTML document.
   a. Background-position   b. Background-place   c. Background-point

B. Answer the following questions.

1. What is HTML?

2. Explain the terms Tags and Attributes.

3. What is an Element? Explain its various types?

4. What are the basic tools used to work with HTML documents? Give an example of each.

5. What are Cascading Style Sheets? Name the different methods available for applying Style rules.

ACTIVITY SECTION

LAB SESSION — Perfection Through Practice

Create a web page using HTML to give description about the 'Endangered species'.

Instructions

➤ Give a title to the web page as 'endangered species'.

➤ Set the background image at the top left of the page and set the background colour to khaki.

➤ Apply Heading level 1 to the text 'Endangered Species' and using style sheet rule set its colour to blue.

➤ Apply Heading level 2 to the text 'House Sparrow' and 'Reasons for ...... Sparrows' and using style sheet rule, set its colour to red.

➤ Give Bold and Italics effect to the paragraph texts as and when required.

GROUP DISCUSSION — For Concept Clarity

Divide the class into two groups and conduct a group discussion on the topic:
Block-level elements and **Text-level elements**

PROJECT WORK — Using Creativity

Create a web page for the website of your school, which will display the first three rank holders of classes 1 – 12. The title of the page should be, **Achievers of the Year**. Make use of appropriate tags and different background properties.

ONLINE LINKS — Looking For More

To know more about HTML5, visit the following sites:

➤ https://www.tutorialspoint.com/html5/

➤ www.html5tutorial.info/

MORE ON CSS3

LEARNING IN THIS CHAPTER

- In-line Style
- Text properties
- Font properties
- Margin properties
- Border properties

A cascading style sheet makes it easier to enhance the look of the different elements on a web page. It defines a structure and way of presentation for the website. In the previous chapter, you learnt about the basics of HTML and CSS. This chapter will further enhance your knowledge and skills on CSS.

IN-LINE STYLE

As explained in the previous chapter, Inline style is also one of the methods used to apply CSS on the elements of a webpage. In this method, style declaration is given with each individual element with the help of 'Style' attribute.

This is not an efficient use of style sheet as the declaration is to be repeated every time even if the same effect is to be used by some other element in a document.

Let us understand this with the help of an example.

```
<html>
<head> <title>in-line method</title>
</head><body>
We are using In-line style here.
<hr style="width:50%; background-color:green;
height:10">
A simple HR tag without style rule
<hr>
The declaration has to be repeated again to apply
the same effect on the HR tag.
<hr style="width:50%; background-color:green; height:10">
</p></body>
</html>
```


TEXT PROPERTIES

Text properties in Cascading Style Sheets provide various formatting options to style the text in a webpage. In the following section. You will learn about the various text properties and their description.

TEXT ALIGN

This property is generally applied to a block of text (h1, p, etc). It is used to set the horizontal alignment of the text

inside the block.

SYNTAX: text-align : value

where value = left|right|center|justify

TEXT DECORATION

This property specifies the decorations that can be applied to the text in a block.

SYNTAX: text-decoration : value

where value = underline|overline|line-through|blink|none

COLOR

This property helps in setting the colour of the text.

SYNTAX: color : value

where value = color name|RGB color code|hexadecimal code

TEXT TRANSFORM

This property is used to transform the letters in a text into uppercase, lowercase, or capitalise the first letter of each word.

SYNTAX: text-transform : value

where value = capitalize|uppercase|lowercase|none

➤ **capitalize** – capitalizes first letter of each word

➤ **uppercase** – capitalizes all letters of each word

➤ **lowercase** – converts all letters of each word to small case

➤ **none** – the text remains unaffected

TEXT SHADOW

The text-shadow property adds shadow around the text. This feature may not be supported by all the browsers.

SYNTAX: text - shadow : value

where value = h-shadow v- shadow color

➤ **h-shadow** specifies the distance of the horizontal shadow

➤ **v-shadow** specifies the distance of the vertical shadow

➤ **color** specifies the color of the shadow

NOTE

A negative value of h-shadow places the shadow to the left of the text and a negative value of v-shadow places the shadow above the text.

TEXT INDENT

The text-indent property specifies the indentation of the first line of a text.

SYNTAX: text-indent : value

where value = length in px or %

WORD BREAK

The word-break property specifies the line breaking rules.

SYNTAX: word-break : value

where value = normal|break-all|keep-all

➤ **normal** – Words will break according to their usual rules

➤ **break-all** – The lines will break at any character

➤ **keep-all** – The lines will break at hyphens

LINE HEIGHT

This property is used to specify the space between two lines of the text.

SYNTAX: line-height : value

where value = number|length|percentage|normal

```html
<html>
<head>
<title>text properties</title>
<style type="text/css">
body{color:blue;text-decoration:
underline;}
p{text-indent:30px;
text-transform:capitalize;
line-height:1.5}
h1{text-align:center;text-shadow:2px
2px red}
</style>
</head>
<body>
<h1>Success</h1>
<p style=word-break:break-all>Success is about who you are, not what you have. Successful people work to discover their talents, to develop discovered-talents, and then to use those talents to benefit others as well as themselves.</p>
<p style=word-break:keep-all>Success is about who you are, not what you have. Successful people work to discover their talents, to develop discovered-talents, and then to use those talents to benefit others as well as themselves.</p>
</body>
</html>
```
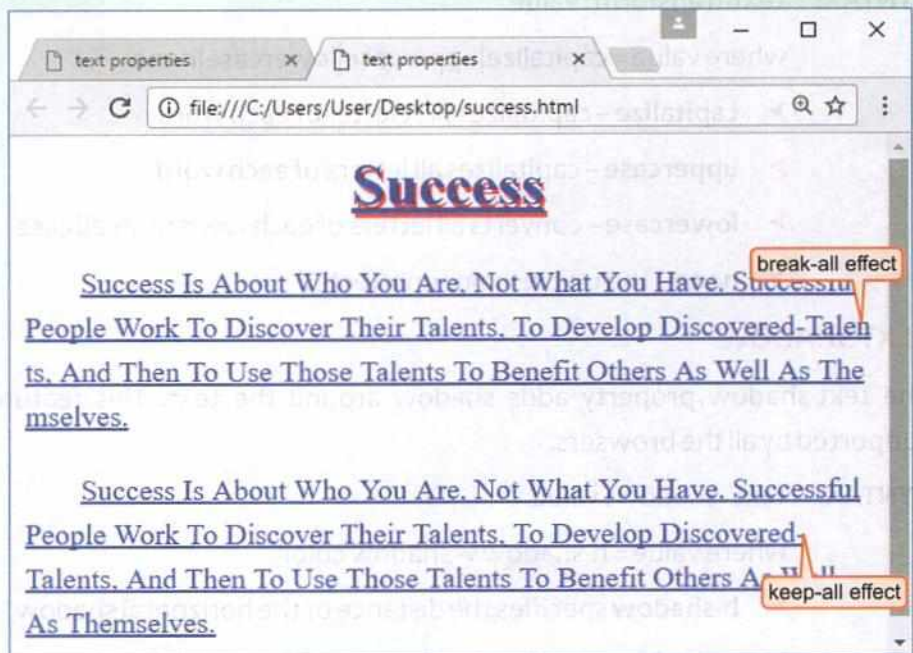
Font properties facilitate the settings and appearance of individual characters in a line of text. Let us discuss the various font properties.

FONT FAMILY

Font family specifies the prioritised list of fonts to be used to display a given element or web page.

SYNTAX: font-family : value

where value = family name|generic-family

Generic families are groups of family names that have uniform appearances.

For example :

Cursive : Family of cursive fonts, which look like handwritten text.

e.g. Comic Sans, Monotype Corsiva.

Serif : Family of fonts, which have finished strokes or pointed ends.

e.g. Times New Roman.

Sans-serif : Family of fonts, which have plain ends.

e.g. Arial, Verdana.

Monospace : Family of fonts in which all the characters have the same fixed width.

e.g. Lucida console.

Fantasy : Family of decorative fonts.

e.g. Impact.

FONT SIZE

It is used to set the size of the text.

SYNTAX: font-size : value

where value can be

- ➤ xx-large
- ➤ x-large
- ➤ large
- ➤ larger
- ➤ medium
- ➤ small
- ➤ smaller
- ➤ x-smaller
- ➤ xx-smaller
- ➤ length
- ➤ %(percent)

FONT STYLE

This property displays the chosen font, either in normal, italic, or oblique.

SYNTAX: font-style : value

where value = normal|italic|oblique

FONT

This property is used as a shorthand method to set all the above properties in one single declaration.

SYNTAX: font : value

where value = font-style font-size font-family

Example: p { font: oblique 12px Impact, Fantasy;}

```
<html>
<head>
<title>font property</title>
<style type="text/css">
body{background-color:rgb(201,150,100)}
</style>
</head>
<body>
<p style="font-family:monotype
Corsiva;font-size:xx-large">You don't
make progress by standing on the
sidelines, whimpering and
complaining. You make progress by
implementing ideas.</p>

<p style="font-family:times new
roman;font-size:x-large">You don't
make progress by standing on the
sidelines, whimpering and
complaining. You make progress by
implementing ideas.</p>

<p style="font-family: verdana;font -
size:large;font-style:italic">You don't
make progress by standing on the
sidelines, whimpering and
complaining. You make progress by
implementing ideas.</p>

<p style="font-family:lucida
```
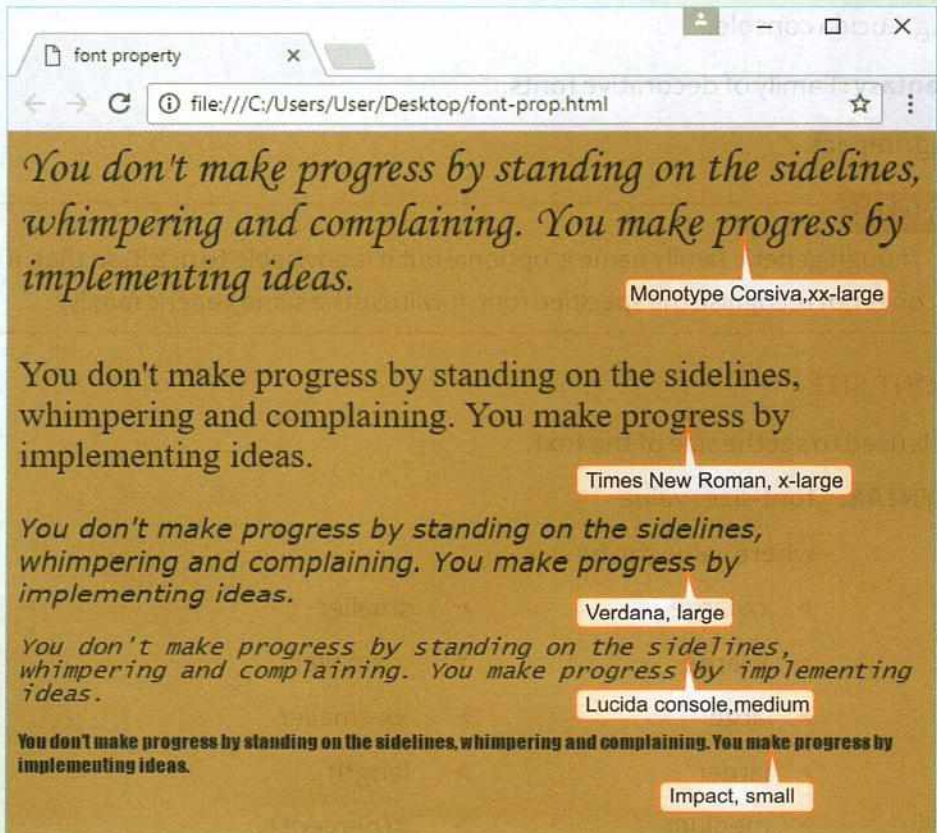

You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas.
— Monotype Corsiva,xx-large

You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas.
— Times New Roman, x-large

You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas.
— Verdana, large

You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas.
— Lucida console,medium

You don't make progress by standing on the sidelines, whimpering and complaining. You make progress by implementing ideas.
— Impact, small

MARGIN PROPERTIES

In HTML, each element has four sides: right, left, top, and bottom. The Margin properties are used to set the margin on HTML document; you can change the presentation of elements by setting the margin and padding properties. The **Margin** is defined as the distance from each side to the sides of the neighbouring elements of the document.

Margin properties are used to specify the amount of free space surrounding an element.

➤ **Margin-top :** Sets the top margin of an element

➤ **Margin-right :** Sets the right margin of an element

➤ **Margin-bottom :** Sets the bottom margin of an element

➤ **Margin-left :** Sets the left margin of an element

SYNTAX: margin-side : value

 where side = top|right| bottom|left and value = length|percentage|auto

 ➤ **length** – Margin is specified in units of length, such as px, pt, cm, etc.

 ➤ **percentage(%)** – Margin is specified in % of the width of the containing element.

 ➤ **auto** – Browser calculates the margins itself.

We can also use **margin** property to set all the margins in one declaration.

SYNTAX: Margin : value of top margin   value of right margin   value of bottom margin   value of left margin

Example : Margin :   10 px   5px   10 px   ✚   5px

        Margin:10 px 5px 10 px 5px

BORDER PROPERTIES

Border properties help you to set the border style, border width, and border colour of an HTML element.

BORDER WIDTH

It helps in specifying the width of all the four borders of an element. This can be defined by the values 'thin', 'medium', and 'thick'. Its default value is 'medium'.

SYNTAX: border- width : value

 where value = thin| thick| medium| numeric value in pixels

BORDER STYLE

It sets the style of the border. Its default value is 'none'.

SYNTAX: border-style : value

where value = none| hidden| dotted| dashed| solid| double| groove| ridge| inset| outset

BORDER COLOR

This property allows you to change the colour of the border surrounding an element. You can individually change the colour of the bottom, top, left and right sides of an element's border.

SYNTAX: border-color : value

where value = colour name|colour value (hexadecimal or RGB)

BORDER

It sets all the border properties in one declaration.

SYNTAX: border: border-width border-style border-color

> **NOTE**
>
> Always declare the border-style property before the border-width and border-color property because an element must have borders before its width and colour is set or changed.

```
<html>

<head>

<title>border property</title>

<style type="text/css">

body{background-color:rgb(255,195,11)}

</style>

</head>

<body>

<p style="font-family:monotype corsiva; font-size: 40px; font-weight: normal;border-style:ridge;
border-color:blue;border-width:thick"> Hard-work beats talent when talent doesn't work hard.</p>

<p style="font-family:monotype corsiva; font-size:40px; font-weight: normal;border-style:groove;
border-color:yellow;border-width:medium"> Hard-work beats talent when talent doesn't work hard.</p>

<p style="font-family:monotype corsiva; font-size:40px; font-weight: normal;border-style:dashed;
border-color:green;border-width:medium"> Hard-work beats talent when talent doesn't work hard.</p>

<p style="font-family:monotype corsiva; font-size:40px; font-weight: normal;border-style:dotted;
```

border-color:yellow;border-width:thick"> Hard-work beats talent when talent doesn't work hard.</p>

```
<p style="font-family:monotype corsiva; font-size:40px; font-weight:normal;border-style:double; border-color:red;border-width:thick"> Hard-work beats talent when talent doesn't work hard.</p>
```

```
<p style="font-family:monotype corsiva; font-size:40px; font-weight:normal;border-style:inset; border-color:green;border-width:thick"> Hard-work beats talent when talent doesn't work hard.</p>
```

```
<p style="font-family:monotype corsiva; font-size:40px; font-weight:normal;border-style:outset; border-color:blue;border-width:thick"> Hard-work beats talent when talent doesn't work hard.</p>
```

```
</body>
```

```
</html>
```


RECAP

> A Cascading Style Sheet makes it easier to enhance the look of the different elements on a web page.

> In the In-line style method, style declaration is given with each individual element with the help of the style attribute.

> Text properties in cascading style sheets provide various formatting options to style the text in a web page.

> Font properties facilitate the settings and appearance of individual characters in a line of text.

> Margin properties are used to specify the amount of free space surrounding an element.

> Border properties help you to set the border style, border colour, and border width of an HTML element.

SECTION - A

A. Fill in the blanks.

1. _____ sets the horizontal alignment of the text inside the block.

2. _____ property is used to specify the space between two lines of text.

3. _____ displays the chosen text either in normal, italic, or oblique.

4. _____ property is used to convert the text into uppercase or lowercase.

5. In _____ method, style declaration is given with each individual element with the help of the Style attribute.

6. _____ is the distance from each side of an element to the sides of the neighbouring elements.

HINTS • Font-style • Line-height • Text-transform • Text-align • Margin • In-line

B. State True or False.

1. Generic family names should always be written in quotation marks.

2. Font size sets the size of the text.

3. Word-break property specifies space between two words.

4. It is not possible to specify margins individually for each side.

5. The default value of border-style is ridge.

6. CSS provides formatting options to style the text of a webpage.

C. Application-based questions.

1. Shruti has displayed the entire text of her document in uppercase. Name the property she must have used to achieve the same.

   _____

2. Rimi wants to apply shadow effect to the heading of her web page. How can she do it?

   _____

3. Rajat wants to assign green colour to the paragraph. Write the code that will help him in completing the task.

   _____

A. Multiple-choice questions.

1. Which of the following values of the font-style property displays the text in cursive form?

    a. Normal   b. Italics   c. Oblique

2. Identify the correct code.

    a. Border-style: double_side   b. Border-style: single_side   c. Border-style: inset

3. Choose the property that enables you to specify the space between the lines of text.

    a. Font-Height   b. Font-Weight   c. Line-Height

4. Which property allows you to apply decorations to the text in a block?

    a. Color   b. Font-Decoration   c. Text-Decoration

5. Which property has Overline as one of the possible values?

    a. Text-Style   b. Text-Decoration   c. Text-Transform

6. .... is the family of fonts, which has finished strokes or pointed ends.

    a. Cursive   b. Monospace   c. Serif

7. ....property specifies line breaking rules.

    a. Word-break   b. Line-break   c. Text-break

8. If the font size is not specified, the default size of normal text would be ....

    a. 10px   b. 20px   c. 16px

B. Answer the following questions.

1. Differentiate between the properties: Text-decoration and Text-shadow.

    ....
    ....
    ....
    ....

2. Explain the utility of the font-family property.

    ....
    ....
    ....

3. How can you set the margins for an element?

....

....

4. What values can be assigned to the Font-size property?

....

....

5. Explain the In-line method of applying CSS.

....

....

....

....

6. Write a short note on Border properties.

....

....

....

....

7. Write short notes on the following:

Text-Indent

....

....

Word-break

....

....

Text-transform

....

....

Line-height

....

....

ACTIVITY SECTION

LAB SESSION — Perfection Through Practice

Create a Web page similar to the one given in the figure.

➤ Give title to the web page as 'Clean India Mission'.

➤ Set the background image at the Center top of the page.

➤ Place a grey–coloured horizontal rule.

➤ Using Style Sheet rules, apply Heading level 1 to the text 'CLEAN INDIA MISSION'. Centre align it, set the font family as Times New Roman, font-color: green, font-size: 200%. The heading should be in uppercase. At the end, place three horizontal rules.

GROUP DISCUSSION — For Concept Clarity

Divide the class into two groups and discuss on the topic:
Text-property vs **Font-property**

PROJECT WORK — Using Creativity

Create a web page on the topic **Tourist places of India**. Set a suitable background colour, image, font and font colour for the web page. Also, set the top and bottom margins.

ONLINE LINKS — Looking For More

To learn more about CSS properties, visit the following sites:
http://www.htmlhelp.com/reference/css/properties.html

CYBER TOOLS

Millions and millions of computers with the internet access, communicate with each other around the clock. This shows the amount of activity happening on the Internet, which acts as a **Global Network Platform**. The services available on net are colossal. Some of the basic and important services of the internet are: Online Chat, Video Conferencing, File Transfer, Cloud Computing, Online File Storage, and so on.

CLOUD COMPUTING

Cloud is defined as a set of hardware, networks, storage, applications, and services combined together to deliver different aspects of computing as a service over a network or the internet.

Applications, such as e-mail, web conferencing, customer relationship management (CRM), all run in cloud. Salesforce – an American cloud computing company provides a CRM cloud software that addresses all the business needs of the customers.

Cloud Computing refers to manipulating, configuring, and accessing the applications online without installing them. Moreover, this centralised storage, memory, and processing allow efficient and cost-effective computing. It makes the business applications mobile and collaborative.

Along with this, copyright violations and piracy have seen a sharp decline over the past few years, as the users instead of using pirated software can easily access the authentic content by paying a fraction of the total cost. Cloud computing is 100% secure and supports data confidentiality to use cloud computing facility. Thus, you can say that cloud computing is a model for enabling convenient and on demand network access to a shared pool of computing resources (e.g., networks, servers, storage, software applications, and services) that can be released with minimal efforts or service provider interaction.

ONLINE SHARING

Online Sharing is basically sharing a file with one or more
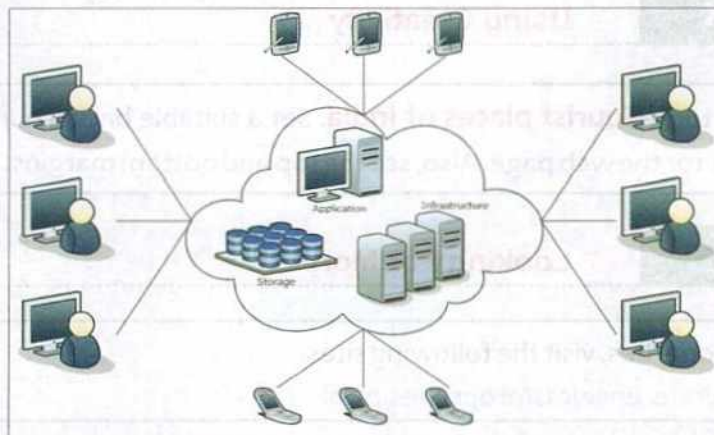
Figure 9.1: Cloud Computing

users through the internet. It involves storing and accessing a file, such as documents, photos, videos etc., on a cloud based storage. Google Drive, Microsoft OneDrive, Dropbox, etc., are some of the common examples of free or economical cloud storage for the users.

To share files on a cloud based storage, users are first required to upload the file on the cloud server. Once the file is stored on the cloud, it is assigned a unique URL, which the user can use to access, view, edit, download or share the file.

GOOGLE DRIVE

Google Drive is a free online storage service provided by Google that allows you to store files securely on a **cloud** with an internet connection. You can access your files anytime and anywhere from any device, such as computer, smartphone or a tablet using the cloud.

Google drive provides 15 GB of free online storage that enables you to store all kinds of files and documents on it. You can store unlimited amount of photos, drawings, recordings, videos, attachments, text documents, and much more.

Google drive not only stores your files but also gives access to free web based applications for creating documents, spreadsheets, presentations, and more.

It also allows the users to share files and folders, edit documents in a collaborative way, which enhances the efficiency and productivity.

> **NOTE**
>
> The Google Drive can be accessed offline on the Google Chrome browser via a **Chrome** app, which can be installed from the Chrome Web Store.
> Google also offers various storage plans with a monthly subscription. The storage capacity of Google Drive can be increased from 100 GB to 30 TB.

UPLOADING FILES ON GOOGLE DRIVE

To upload a file,

➤ Sign in your gmail account.

➤ Go to the **Google apps** launcher ▦ . Select the **Drive** icon ▲ . The **Google Drive** window opens.

➤ To upload a file to your drive, choose the **Upload files** option from the **My Drive** drop-down list .   Or

Click on the **New** button and select the **File upload**.

➤ An **Open** dialog box appears. Browse and select the file(s) you want to upload and then click on the **Open** button.

Figure 9.2: Opening Google Drive Folder

Figure 9.3: Uploading Files on Google Drive

➤ The pop up window appears notifying the uploading status of your document.

➤ Once completed, the uploaded files will appear in your Google Drive folder.

➤ Similarly, you can upload a folder either by clicking the **Upload folder** option from the **MyDrive** drop-down list. Or

By selecting the **Folder Upload** option from the **New button**.

➤ The **Browse For Folder** dialog box opens. Select the folder that you want to upload and click **OK**.

Once you upload the files to Google Drive, you can manage, organise, share and access them from anywhere. You can also edit your files online, but for that it is required to convert them to Google Drive format.

💡 You can also drag and drop the files and folders to the Google Drive folder.

▷ ONEDRIVE

OneDrive, previously known as **SkyDrive** or **Windows Live SkyDrive**, is a free online storage facility offered by Microsoft. As the name suggests, it is a single place where you can store all your photos, videos, documents, and much more in an organised manner and that too free of cost. It allows the users to specify the files they want to keep private, share with contacts, or make public.

It is a password-protected storage area in the cloud that allows the users to upload and synchronise the data to cloud storage, and then access it from the web browser anytime. It works well on all devices, like PC, Mac, Android, and iOS. Microsoft offers **5GB** free storage space to all its OneDrive users. It provides various other storage plans to upgrade the storage space.

OneDrive is also available as a pre-installed app on windows 10. To access OneDrive in Windows 10:

➤ Click on **Start > scroll down to OneDrive**. The Microsoft OneDrive window will open.

➤ Enter your Microsoft e-mail address and click on **Sign in** button.

➤ Enter the password and click on **Next**.

➤ The location of your OneDrive folder is displayed on the screen. You can change the location of this folder by clicking on the **Change location** button. Click on the **Next** button.

Figure 9.4: Signing-in OneDrive

- Click the checkbox in front of **Sync all files and folders in my OneDrive**. This will automatically save all your files and folders on OneDrive. Click on the **Next** button. Your OneDrive is now ready for use. To open OneDrive folder, click on the **Open my OneDrive folder** button.

- To add any of your files to OneDrive, drag them to your OneDrive folder.

Once uploaded to OneDrive, you can work in collaboration on your documents by sharing them with multiple people.

> If you want to upload only the chosen files, then just select and drag them to the OneDrive folder.

Figure 9.5: Syncing Files and Folders in OneDrive

GOOGLE MAPS

Google Maps is a free web mapping service that provides various types of geographical information. It offers real-time traffic conditions and step by step directions to reach a destination by any mode of transportation. It also renders satellite view, user submitted photos, 360 panorama and street view, thereby making it an interactive way to learn about different places all over the world. It is accessible through your web browser or as an app for mobile devices. While using Google Maps on Smartphone, you get even better directions. If there is traffic congestion on your way, it will suggest an alternative route. Apart from finding the way, Google Maps provides a lot of information about different places built right into the map.

For example, you can look up the address of a local ice cream shop by just searching for its name. You will be able to see even the closing time of the shop and grab a link to the website.

Unlike a paper map, Google Maps is not limited to one state or country. Infact, it provides maps for almost every country in the world.

HOW TO USE GOOGLE MAPS ON YOUR DESKTOP

- Visit the link **maps.google.com**. Or

  Conduct a search on Google for the name of a location. Various links to Google Maps will appear.

- Select the link. It will move the **location** pointer to the destination point.

- Click and drag the map to view the area and get an idea about the route to be followed.

- You can click on the **Zoom** button ⊞ at the lower-right corner to zoom in the image and get a better view.

- To view the location in Satellite view, click on the **Earth** view button ◉ present at the lower-left corner.
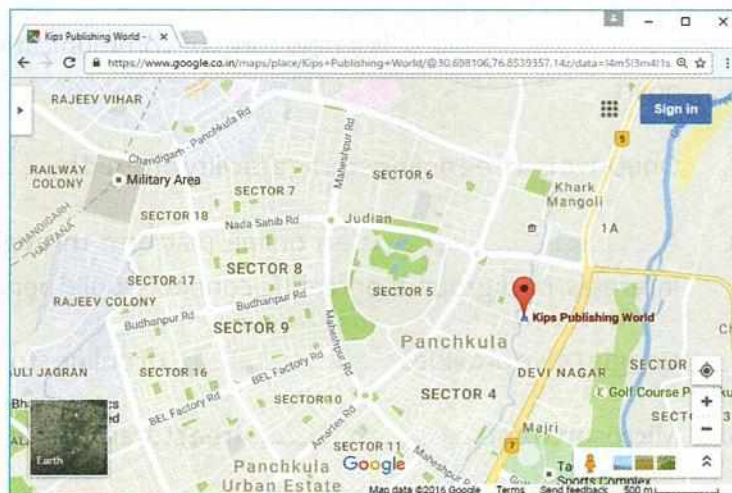
Figure 9.6: Using Google Maps

RECAP

> Google Drive is a free online storage service provided by Google that allows you to store files securely on a cloud with an internet connection.

> OneDrive, previously known as SkyDrive or Windows Live SkyDrive, is a free online storage facility offered by Microsoft.

> Cloud is defined as a set of hardware, networks, storage, applications, and services combined together to deliver different aspects of computing as a service over a network or the internet.

> Google Maps is a free web mapping service that provides various types of geographical information.

BRAIN DEVELOPER

SECTION - A

A. Fill in the blanks.

1. .... is a new form of communication in which the users can describe their status in short posts.

2. OneDrive is a free online storage facility offered by ....

3. A .... is an online platform through which people, who have same personal or business interests, backgrounds or real life connects, build personal relations with each other.

4. Google Drive provides .... of online storage that enables you to store all kinds of files on it.

5. Microsoft offers .... free storage space to all of its OneDrive users.

B. State True or False.

1. One drive is a free online storage facility.

2. The storage capacity of Google Drive can be increased upto 100 GB only.

3. You cannot share files stored on Google Drive.

4. Cloud computing provides only hardware resources as a service over a network.

5. Google Maps is limited to only one country.

C. Application-based questions.

1. Deep wants to upload a video on Google Drive. Suggest the option that he should select in order to accomplish the task.

   ....

2. Radhika is on the way to catch her flight. On her way to the airport, she lost the way. Suggest an App that Radhika can use find the location of the airport.

   ....

SECTION - B

A. Multiple-choice-questions.

1. .... is the process of sharing a file with one or more users through internet.

   a. Online sharing   b. Video conferencing   c. Updates

2. The storage capacity of Google Drive can be increased from ....

   a. 5GB to 15 GB   b. 15GB to 1 TB   c. 100 GB to 30 TB

3. .... window is used to notify uploading status of a document.

   a. Webpage   b. Pop-up   c. Icon

4. .... is a free service that provides various types of geographical information.

   a. Google Drive   b. Google Maps   c. Cloud

B. Write a short note on the given topics.

1. Online Sharing:

....

....

2. OneDrive:

....

....

3. Google Map:

....

....

C. Answer the following questions.

1. What is cloud computing? Explain briefly.

....

....

....

....

2. What is the use of Google Drive?

....

....

....

3. Explain briefly the use of Google Map.

....

....

....

4. Write the steps to upload files on Google Drive.

....

....

....

....

ACTIVITY SECTION

LAB SESSION   Perfection Through Practice

Open Google Maps and find the location and address of a nearby ice cream shop.

1. Visit the link **maps.google.com**.

2. In the **Search box**, type 'ice cream shop' and press **Enter** key or click on the Search icon.

3. A list showing the names of different ice cream shops will be displayed in the **Showing results** panel.

4. Next, from the list, select the name of your favourite ice cream shop and click on it.

   Or

   Locate the position of the ice cream shop on the map and click on the icon. This will further show the relevant information like address, phone number, website link, etc.

GROUP DISCUSSION   For Concept Clarity

Discuss the following topic with the students:
One Drive vs **Google Drive**

PROJECT WORK   Using Creativity

Create a Microsoft PowerPoint presentation on five **Latest IT Inventions,** and upload the presentation on **One Drive**.

ONLINE LINKS   Looking For More

To know more about cloud computing, visit the following sites:
➤ www.ibm.com/cloud-computing/what_is_cloud_computing
➤ www.gcflearnfree.org/googledriveanddocs

CYBER THREATS & SECURITY

Computer and the internet have become inseparable parts of your life in multiple spheres these days. The booming technologies of the modern age have made your life much easier and more connected across the globe via the interconnected networks. Now-a-days, you are connected to the internet by many means, i.e., through computer, smartphone, or tablet. These gadgets are used for storing personal information, online banking, online shopping, booking tickets, playing games, and connecting with friends over social media.

Although networks of today have simplified the communication process and provided great opportunities in almost all spheres, there are various types of challenges and threats associated with the use of these networks of today. These threats are known as cybercrimes.

CYBERCRIME

A cybercrime is any illegal activity done through the internet e.g., identity theft; where somebody can steal your e-mail id or password and use it to send fake e-mails to people containing false information about the product or winning a lottery, etc.

Then there are credit card account thefts, internet frauds like, ordering goods in your name, extracting mobile phone contacts, etc., forgery, i.e., imitating documents and currency, harassing others and mischief mongering, by sending threatening messages, all of which come under the jurisdiction of the Indian Penal Code (IPC).

Cybercrimes can be divided into three main categories:

➤ Crime against an individual person

➤ Crime against property

➤ Crime against an organisation/society

CYBERCRIMES AGAINST AN INDIVIDUAL PERSON

The offences that cause or attempt to cause harm or threat to an individual come in this category. These crimes can be committed in the form of:

E-MAIL SPOOFING

Spoofing means hoax or misleading. In it, a receiver of a message is fooled into believing that the message received by him is from a trusted source, which actually is not so. The

message is bogus. When a user clicks on the link that is falsely provided by the sender, the malware or virus enters into the system of the user.

CYBER STALKING

In it, an attacker harasses a victim through e-mails, social media, chat rooms, blogs, instant messaging, etc. A stalker can be an online stranger or a person known to the targeted person. In cyber stalking the person can:

> harrass and humiliate the victim by posting false information about him.

> monitor or view a victim's online activites.

> damage the victim's computer by sending viruses.

CYBER BULLYING

It is an act of harming or harassing through information technology in a deliberate manner. This includes insulting remarks and threatening messages sent by e-mail, spreading rumors about the person either by e-mails or social networking sites, posting embarrassing photos and videos to hurt the person, making derogatory remarks against gender, race, religion, or nationality.

CYBERCRIMES AGAINST PROPERTY

In real life, you hear of stealing or robbing of one's property. In cyber world also, criminals look for an opportunity to steal or rob through the internet. They can steal a person's bank details and withdraw money from his account, misuse credit card of a person, spoil the system of an organisation through malicious software to gain access to it.

IDENTITY THEFT

It refers to the act of stealing and misuse of someone's personal information. It is a major issue for people who use the internet for online shopping, cash transactions, and banking services. The stolen information generally includes a person's name, date of birth, account number, credit/debit card number, ATM pin, etc. This information is then misused to obtain genuine documents, new credit cards to make purchase, withdraw money, get passports, and driving licences in the victims name. Hackers steal the information either through hacking the network that a person is connected to or placing a software, unknowingly, on a person's computer.

PHISHING

It is an act of sending an e-mail to a user misleading him to believe that it is from a trusted person or organisation. The user is asked to visit a website in which he is asked to update or validate his personal details, such as the user name, password, and credit card details.

In this way the operators of the fake website commit crimes in your name after stealing your identity.

PHARMING

In this type of attack, a piece of malicious code is installed on a computer or a server, which misdirects the users to fraudulent websites without their knowledge in order to obtain personal information, such as passwords, or account numbers.

⧐ CYBERCRIMES AGAINST ORGANISATION/SOCIETY

It is a planned and politically motivated attack to cause large scale disorder in computer networks. This category can cause panic amongst the civilians. In this category, criminals hack government websites, military websites, or circulate propaganda.

TRANSMITTING VIRUS

A computer virus is a program or a set of programs that disrupts the normal functioning of a computer. A virus infects or destroys data. Like biological virus, it enters into the host (computer) without the permission or knowledge of the host. The full form of **VIRUS** is **V**ital **I**nformation **R**esources **U**nder **S**eize. The essential resources of a computer, like memory, processing speed, data, and programs are hampered when a virus enters into the system. Virus programs are self-replicating programs, which continuously expand their reach by infecting more and more computer files, resulting in the loss of speed and destruction of data. Creating a computer virus and spreading it is a cybercrime. Almost all the viruses are attached to an executable file, which means that if a virus exists on a computer, it will not infect the computer unless you run or open the malicious program.

Types of Virus

There are different types of viruses but broadly they can be classified into the following categories:

Boot Sector Virus

This type of virus damages the boot sector of a hard disc or floppy drive. A disk or hard drive comprises smaller sections known as Sectors. The first sector is called the boot sector. It holds the master boot record, which is responsible for reading and loading the operating system. Boot Sector Virus becomes active at the time of booting the machine and destroys the data in hard disk.

For example: Disk killer, Stone virus, etc.

Program File Virus

This virus infects the executable files or programs, such as those with extension, like .com, .exe, .ovl, .drv, .sys, etc. These programs get loaded in the memory during the execution. The virus becomes active in the memory by replicating itself and infecting files and other programs on the disk with the intention of causing permanent damage or making them unreadable.

For example: Sunday, Cascade, etc.

Multipartite Virus

A multipartite virus is a hybrid of a Boot Sector and Program File virus that spreads in multiple ways. The virus gets entry into the computer system through some infected media and then resides inside the computer memory. After that this virus moves into the hard drive, infect, the boot sector and starts spreading in the system by infecting the executable files.

For example: Invader, Flip, Tequila, etc.

Polymorphic Virus

As the name suggests (poly-many, morph-forms), this type of virus exhibits itself in different forms every time it infects a file and changes its binary pattern to avoid detection by an antivirus program. For examples: **Elkern, Marburg, Satan bug, etc.**

Network Virus

Network viruses rapidly spread through a Local Network Area (LAN), and sometimes throughout the internet. Generally, network viruses multiply through shared resources, i.e., shared drives and folders. When the virus infects a computer, it searches through the network to attack its new potential prey. When the virus finishes infecting that computer, it moves on to the next and the cycle repeats itself. The most dangerous network viruses are **Nimda and SQL Slammer.**

Macro Virus

A Macro virus is associated with the application software, like Word, Excel, Powerpoint. When opening the infected document, macro virus gets loaded into the main memory and destroys the data stored in the hard disk. These viruses cause a sequence of actions that get performed automatically, when the application starts. Once a macro virus gets active on to your computer, every document you produce will become infected.

For example: Melissa.A, Relax, bablas, etc.

CYBER VANDALISM

It is the creation of malicious programs to perform harmful tasks, like to physically harm a computer or any of its parts, putting a malware on a computer that erases the hard drive data or steals sensitive information. It also involves editing the online content in a malicious manner so as to defame a website or disrupt businesses.

HACKING

Hacking refers to an illegal entry into a computer system or network. Hackers write or use ready-made computer programs to attack the target computer. Some hackers do it

just for enjoyment while the others hack for personal monetary gains by stealing credit card information and transferring money from various bank accounts to their own or stealing sensitive information and extorting money from some corporate giants.

CYBER SQUATTING

It refers to the act of using the goodwill of a trademark belonging to someone else and getting benefit out of it.

FORGERY

It is an act of imitating or making a false copy of a document like Birth Certificate, Driving Licence, Currency notes, Cheque Book, Passport, Postage/Revenue Stamps, Mark Sheets, etc., with an intent to check an individual or organisation. Special software, scanners, and other devices are used to recreate these documents and proceed with the intended scam.

CYBER EXTORTION

It is a crime in which the victim is attacked first and then demanded to pay money to stop further attacks. Cyber extortion may be done by blocking the system resource of the victim by some Ransomware or Denial of Service (DOS) attack. Hacked e-mails are used to commit this crime. These fake e-mails force the user to click on some links that may install the malware.

CYBER TERRORISM

It is used to conduct terrorism through the use of computers and the internet in order to cause fear and panic. It causes large scale disruption of computers, telecommunication networks or information systems, so as to compel a government or its people to fulfil some social, religious, or political objectives. Attacks on military installations, power plants, air traffic controls, banks, etc., are some examples of cyber terrorism.

⇒ CYBER SECURITY

Cyber security is a collection of technologies, processes, and practices designed to protect networks, computers, programs, and data from attack, damage, or unauthorised access. It includes the use of the following:

ANTIVIRUS

Antivirus is a computer program that is designed to identify, prevent, and remove viruses from a computer. It performs the following tasks in a computer:

➤ Scans the computer files to look for known viruses from virus dictionary.

➤ Identifies suspicious behaviour of any computer program, which might indicate infection.

➤ Scans incoming e-mails, which might contain virus in the attachment.

Some popular antivirus software in use nowadays, are as follows:

McAfee, AVG Antivirus, Quick Heal, Microsoft Security Essentials, Symantec Norton Antivirus.
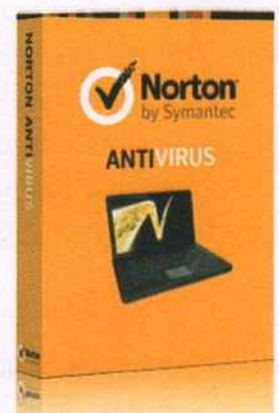
Features of Antivirus Software

➤ **Full System Scans:** These types of scans are needed when you install antivirus software for the first time or recently you have updated your antivirus software. This ensures that there are no hidden viruses present in your system.

➤ **Custom Scan:** It helps you to scan your system as per your requirements.

➤ **Virus Definitions:** Antivirus software depends on the virus definitions to identify malware. That is the reason you get regular updates on the new virus definitions.

➤ **Actions taken by antivirus:** Antivirus software takes three types of actions whenever a virus is found. These are:

  ➤ **Repair it:** The identified virus gets removed from the infected file. This is the best option usually.

  ➤ **Delete it:** The infected file gets deleted along with the virus. This option is used if the virus cannot be separated from the data file.

  ➤ **Quarantine it:** When the antivirus program is not sure whether the file is infected or not, it separates out the file so that the virus does not spread. It is called quarantining.

FIREWALLS

Firewall is a security system that protects your computer by preventing unauthorised users from gaining access to it through network or internet. It can either be hardware or software or a combination of both. It is implemented on the gateway of a network and follows a specific set of rules defined by the user or the network administrator. Based on these rules, it controls the incoming and outgoing network traffic.

ENCRYPTION SOFTWARE

While transmitting data over network, you may lose data privacy. You can protect our data from an unauthorised access by using the technique called Encryption. It is the process of converting your electronic data into a form that cannot be easily understood by anyone. Encryption software is used to produce the encrypted text called 'Cipher text'. To read an encrypted message, it has to be decrypted with the same software on the receiver's side. This process is called Decryption. The software applications, such as GnuPg or GPG can be used to encrypt data files and e-mails.

Biometrics

It is the safest method to give authorisation rights to an individual. In Biometrics, a person is verified by means of his/her unique biological or physical characteristics. It identifies a person by retinal scan, finger prints, voice recognition, etc. These characteristics of a person are saved in a database. When a person tries to access the system, the new data put by him is matched with the saved data. If verified by the unique identifier the person is allowed to access the system.

Passwords

A password is a sequence of characters, numbers and special symbols that a user is supposed to enter to gain access to the computer. It guarantees that the system is accessed only by the authorised users. To protect data and important information, strong passwords should be used.

Backups

In computer terminology, backup is the process of making duplicate copies of data, which can be used to restore the original data in case of any loss of it. These additional copies are called backups. Backups can also be used to restore the files that have been deleted accidentally or corrupted by the virus.

Cookies

A cookie is a text message given to a web browser by a web server. The web browser savers this user-specific data in a text file. This file is called a Cookie. This file is later used by the browser to prepare customised webpages. A user is not required to fill the stored information everytime he purchases goods online.

Cookies are otherwise safe documents, which can be deleted anytime. But they can produce harmful consequences if read by an unauthorised person. Hackers can use cookies to gain access to the user's sensitive information, which can be misused to commit further crimes. It is advised to delete the cookies periodically so as to avoid any kind of privacy threat, especially when working on public computers.

RECAP

> A cybercrime is any illegal activity done through the internet.
> Cybercrimes can be divided into three main categories: Crime against an individual person, Crime against property, and crime against an organisation/society.
> In e-mail spoofing a receiver of a message is fooled into believing that the message received by him is from a trusted source, which actually is not so.
> Cyber bullying is an act of harming or harassing through information technology in a deliberate manner, like threatening messages by e-mail, posting of embarrassing photos and videos on social networking sites, etc.
> Identity theft is an act of stealing and misuse of someone's personal information.
> A computer virus is a program or a set of programs that disrupts the normal functioning of a computer. The full form of VIRUS is Vital Information Resources Under Seize.
> Cyber Security is a collection of technologies, processes, and practices designed to protect networks, computers, programs, and data from attack, damage or unauthorised access.
> Antivirus is a computer program that is designed to identify, prevent, and remove viruses from a computer.

SECTION - A

A. Fill in the blanks.

1. A.. can be an online stranger or a person known to the targeted person.

2. .... is an act of harming or harassing through information technology in a deliberate manner.

3. A .... is a program or set of programs that disrupts the normal functioning of a computer.

4. .... is a security system that protects your computer by preventing the unauthorised users from gaining access to it through the network or Internet.

5. In.. a person is identified by retinal scan, finger prints, voice recognition, etc.

HINTS   • Biometrics   • Cyber Bullying   • Virus   • Stalker   • Firewall

B. State True or False.

1. A cookie is a text message given to a web browser by a web server.

2. To protect data and important information, strong passwords should be used.

3. Decryption software is used to produce the encrypted text called Cipher text.

4. The program file virus damages the boot sector of a hard disc or floppy drive.

5. Identity theft refers to the act of stealing and misusing of someone's personal information.

6. Cybercrime is any illegal activity done through the internet.

C. Application-based questions.

1. Arnav's computer hangs frequently as it has virus in it. Which software will you suggest him to install in order to solve this problem.

   ....

2. Sumit's computer is not working properly. The executable files and programs with extensions, like .com, .exe, .drv, .sys, etc. on his PC have got infected. Which type of virus has entered into his computer?

   ....

A. Multiple-choice questions.

1. What is the full form of VIRUS?

   a. Vital Information Resources Under Seize

   b. Various Information Resources Under Sezie

   c. Vital Information Resources Under Size

2. Which among the following virus is a combination of Boot Sector and Program File virus?

   a. Boot Sector   b. Multipartite Virus   c. Polymorphic Virus

3. A .... virus is associated with the application software, like Word, Excel, and Powerpoint.

   a. Network   b. Program File   c. Macro

4. .... is a computer program, that is designed to identify, prevent, and remove viruses from a computer?

   a. Antivirus   b. Decryption   c. Firewalls

5. What do you call the process that converts the electronic data into a form that cannot be easily understood by anyone?

   a. Decryption   b. Encryption   c. Translation

B. Answer the following questions.

1. What is Cybercrime? Give an example.

....

....

....

2. What is difference between Cyber Stalking and Cyber Bullying?

....

....

....

3. What is Phishing?

....

....

4. Mention any two ways in which you can protect your system.

....

....

....

ACTIVITY SECTION

LAB SESSION — Perfection Through Practice

➤ Open Microsoft PowerPoint 2016.

➤ Choose 'Blank Presentation' from the displayed list on the Start Screen.

➤ Select the 'Blank Slide layout' from the Layout button on the **Home** tab.

➤ Click on the **Text Box** button on the **Insert** tab in the **Text** group. Hold-down the left mouse button while dragging the mouse to the right side. Release the mouse button.
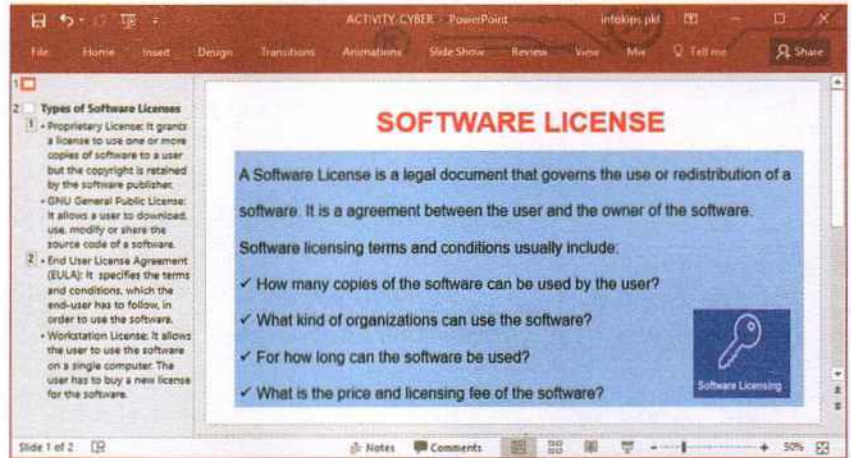
➤ You will get a rectangular box with the insertion point in it.

➤ Enter the text as shown in the first slide. Insert another slide in the presentation.

➤ Click on the **Layout** button on the **Home** tab, and select the 'Two Content' layout from the drop-down menu. Enter the text (refer Outline Pane).

➤ Apply different animation effects to each point. Save the presentation by specifying a name to it.

GROUP DISCUSSION — For Concept Clarity

Conduct a group discussion on : **Cyber Security**.

PROJECT WORK — Using Creativity

Make a presentation on **Different types of Virus and their harmful effects**. Explain the role of antivirus in preventing the virus to enter in a computer. Search and access the information about virus with the help of the Internet.

ONLINE LINKS — Looking For More

To know more about Cyber Security and Virus, visit the following sites:

➤ http://www.itgovernance.co.uk/what-is-cybersecurity.aspx

➤ http://en.wikipedia.org/wiki/Computer_virus

A. Fill in the blanks.

1. ....is a piece of ordinary text that facilitates linking to other documents or webpages.

2. .... operators are used to compare the values

3. In.. a receiver of a message is fooled into believing that the message received by him is from a trusted source, which actually is not so.

4. .... is a free online storage facility offered by Microsoft.

5. In .... , a piece of malicious code is installed on a computer, which misdirects the users to fraudulent websites without their knowledge.

HINTS • OneDrive • E-mail Spoofing • Hypertext • Pharming • Rational

B. State True or False.

1. Antivirus is a computer program, that is designed to identify, prevent, and remove viruses from a computer.

2. Tags do not appear in the browser window.

3. Negative value of horizontal shadow places the shadow above the text.

4. Algorithm is the practical representation of the steps t solve a problem.

5. A cybercrime is any illegal activity done through the internet.

C. Give an example for each of the following.

1. Conditional Statement ....

2. A Boot Virus: ....

3. Online Storage Facility: ....

4. Free Web Mapping Service: ....

5. Cybercrime against an individual ....

WORKSHEET

Chapters 6-10

A. Multiple-choice question.

1. .... is the act of using the goodwill of a trademark belonging to someone else and to get benefit out of it.

   a. Cyber Squatting   b. Cyber Stalking   c. Cyber Bullying

2. .... is the process of making duplicate copies of data, which can be used to restore the original data in case of any loss of it.

   a. Custom Scan   b. Backup   c. Passwords

3. .... editors have graphical interfaces where the webpage is designed and HTML code is added automatically.

   a. Text   b. WYSIWYG   c. Graphic

4. .... property transforms the letters to uppercase , lowercase, or capitalises the first letter of each word.

   a. Text Decoration   b. Text Shadow   c. Text Transform

5. The................................... value of the background repeat property will repeat the image vertically.

   a. Repeat-x   b. Repeat-y   c. Repeat

B. Answer in one word.

1. Name the free web mapping service that provides geographical information. ....

2. Which property in CSS is used to specify space between the lines of text? ....

3. Which Python operator is used for floor division. ....

C. Answer the following questions.

1. How is Internal Style Sheet different from External Style Sheet?

   ....

2. What is meant by encryption?.

   ....

5. What do you understand by Cloud computing?

   ....

ANIMATE CC

Project 1:

Draw a matchstick man figure. Create an animation using the Onion Skin tool.

Project 2:

Create an animation using two layers. Create a sea scene in one layer and fish in the other layer. Animate the fish from one end to the other.
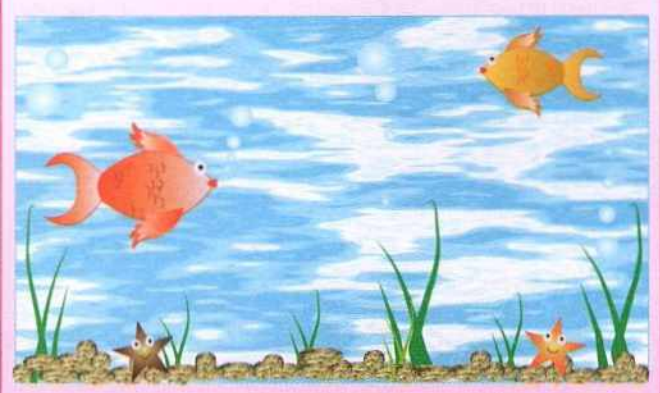
Project 3:

Applying Masking Effect:

+ Import an image of sports stars to the stage.

+ Rename the image layer to **Sports Stars**.

+ Add one more layer and name it **Hexagon Mask**.
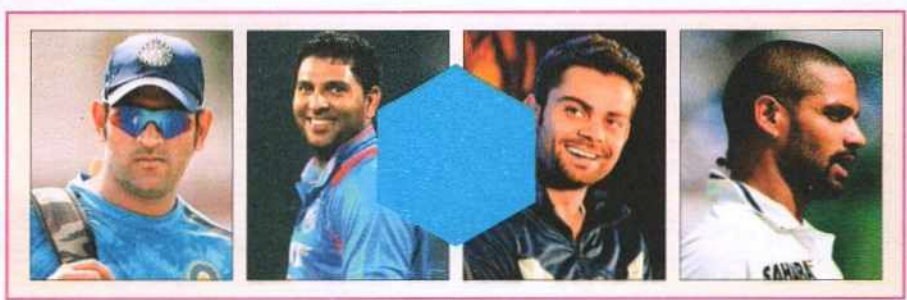
+ Draw the hexagon shape at the centre of the image in **Hexagon Mask** layer.

+ Convert the hexagon into symbol.

+ Insert a keyframe at Frame 60 on the **Hexagon Mask** layer and make it 4 times bigger on this keyframe.

- Select the Frame 1 on the **Hexagon Mask** layer and select **Insert > Classic Tween.**
- Select the **CW** option in the **Rotate** field on the **Properties** panel.
- Right-click on the **Hexagon Mask** layer and select the **Mask** option.
- Press **Ctrl+Enter** to play the Movie.

➤ PYTHON

Design a project for Delhi Vidyut Board that will generate the Electricity Bill based on the current and old meter readings of an electricity meter. The following criteria should be used to calculate the total bill amount:

1. Fixed meter rental and line maintenance charges @ Rs 250.

2. For the first 100 units, every unit will be charged @ Rs 3.25/unit.

3. After 100 units, every unit will be charged @ Rs 4.75/unit.

4. Service tax of 11.5% will be added to the final bill.

```
Python 3.7.2 Shell                                          □ ▣ ✕
File  Edit  Shell  Debug  Options  Window  Help
Python 3.7.2 (tags/v3.7.2:9a3ffc0492, Dec 23 2018, 22:20:52) [MSC v.1916 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
============= RESTART: C:\Users\ADMIN\Downloads\elec_project.py =============
Enter Customer Number:4556
Enter Customer Name:Swaraj
Enter the old reading units:50
Enter the current reading units:500
                  ***********************************************
                           DELHI  VIDYUT  BOARD
                        Bill of suplly for electricity
        Circle: Delhi            Circle Code:103          Phone Number 011-39999707
            ----------------------------------------------------
            Customer Number:                   4556
            Customer Name:                     Swaraj
            Old Meter Reading:                 50
            Current Meter Reading:             500
            Total Units Consumed:              450
            Fixed Rental & Line Maintenance Charges: 250
            Total Usage:                       1987.5
            Total Tax:(11.5%)                  228.5625
            ----------------------------------------------------
            Total Bill Amount Payable          2466.0625
>>> |
                                                        Ln: 24  Col: 4
```

⮞ EXCEL

Project 1: Create an Excel sheet to calculate the Actual Sales for different quarters for the ABC Company.

◢	A	B	C	D	E	F	G
1	REGION WISE SALES REPORT OF ABC COMPANY						
2	Region	Quarter 1 (Rs.)	Quarter 2 (Rs.)	Quarter 3 (Rs.)	Quarter 4 (Rs.)	Actual Sales	Projected Sales
3	North	50000.00	4500.00	31000.00	4500.00	90000.00	90000.00
4	East	4500.00	5000.00	5343.00	3067.00		40000.00
5	West	3067.00	1200.00	23870.00	1200.00		34900.00
6	South	50000.00	5400.00	3067.00	5400.00		70000.00

➤ Open Excel 2016 and type data in the worksheet as shown in the figure.

➤ Fill the data in all the columns except the column, **Actual Sales**.

➤ Click on the cell **F3** and type the formula = **Sum(B3 : E3)**, similarly calculate the **Actual Sales** for rest of the columns.

➤ Apply **Goal Seek** on the column **Actual Sales**, so that it matches with the **Projected Sales**.

➤ Create the Combo Chart by selecting the columns - **Region, Quarter3 and Quarter 4**.

➤ Add one more column in the worksheet and show the **Sparklines** for the Quarters 1 to 4. For example, the Sparklines for the North region will include the data range **B3: E3**. Save the file and close the application.

Project 2: Create an Excel sheet to calculate the Consolidated salary of three different years.

➤ Open **Excel 2016**. Add three more sheets and group them.

➤ Format the data as shown in the figure.

➤ Select the Sheet1 and enter the salary for the **2014**.

➤ Select **Sheet2** and calculate the salary for the **2015** with an **increment of 22%** for all the departments. Similarly, calculate the salary for year **2016** in **Sheet3** with an increment of **30%**.

➤ Consolidate the salary of last three years in **Sheet4**.

➤ Create a **PivotTable** for **Sheet4** and save the file.

Department Wise Salary Increment		
Initial Salary		
S.No.	Department	2014
1	Marketing	45000
2	Sales	30000
3	Content	30000
4	Human Resource	20000
5	Administration	25000
6	IT	40000
7	Accounts	30000

Project 1: Follow the below given instructions to create the home page of a school.
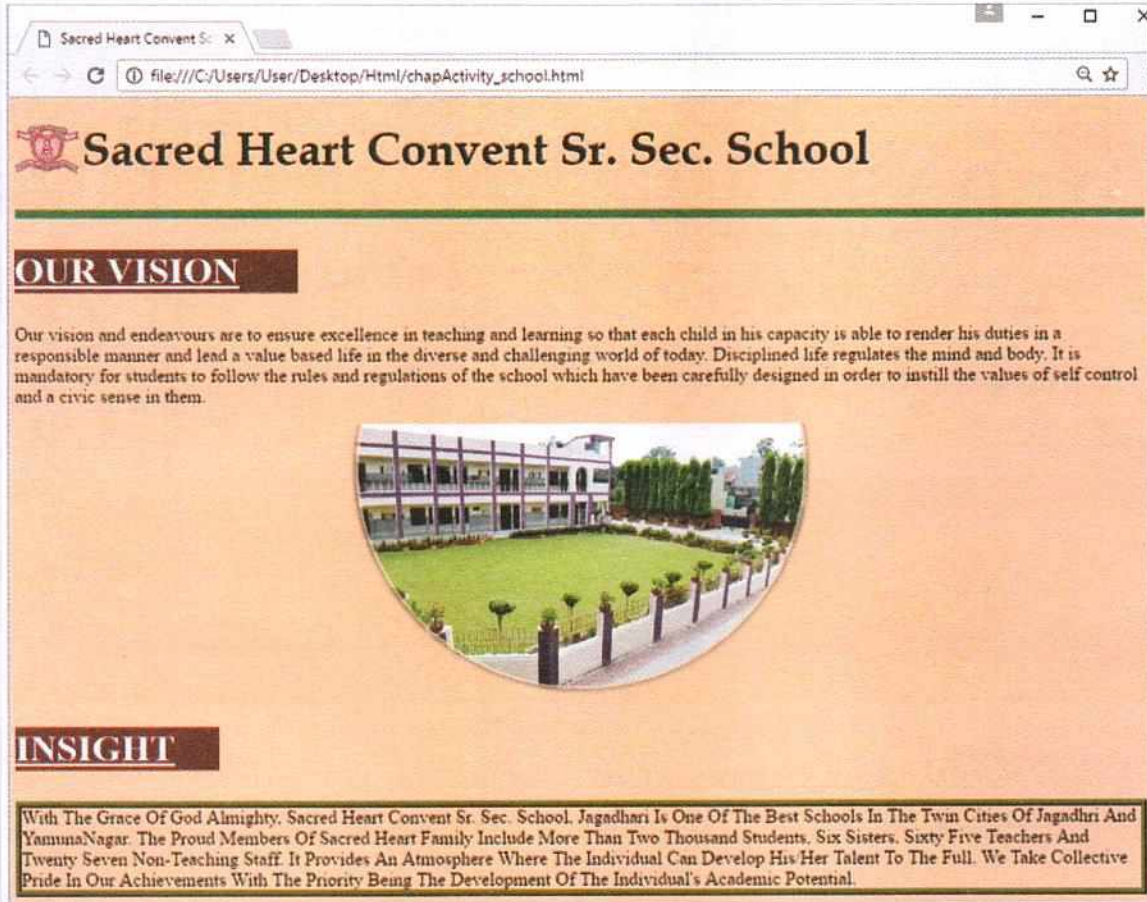
> Give title to the web page as 'Sacred Heart Convent School'.

> Set the background colour of the web page to PeachPuff.

> Insert horizontal rule of Green color.

> Using Style sheet rules, apply Heading level 1 to 'Sacred Heart Convent Sr. Sec. School'.

> Top align and capitalize the text, set font-size to 500% and Font-family to Book Antiqua.

> Place the logo of the school on the left side of the heading.

> Insert another green coloured horizontal rule.

> Using Style sheet rules, apply Heading level 2 to 'OUR VISION'. Set the text in uppercase, underlined with background color 'Maroon', and text color 'White'. Use appropriate Font size.

> Italicise the paragraph text and set the font to 'Times New Roman'.

> Insert one good image of the school.

> Apply the same settings to the heading, 'INSIGHT' as used in the previous heading 'OUR VISION'.

> Apply border to the paragraph text with the border color - Olive and style as Ridge. The text of this paragraph should be capitalised.

Project 2: Follow the below given instructions to create a web page similar to the one given in the figure, describing the **Benefits of After School Club**.
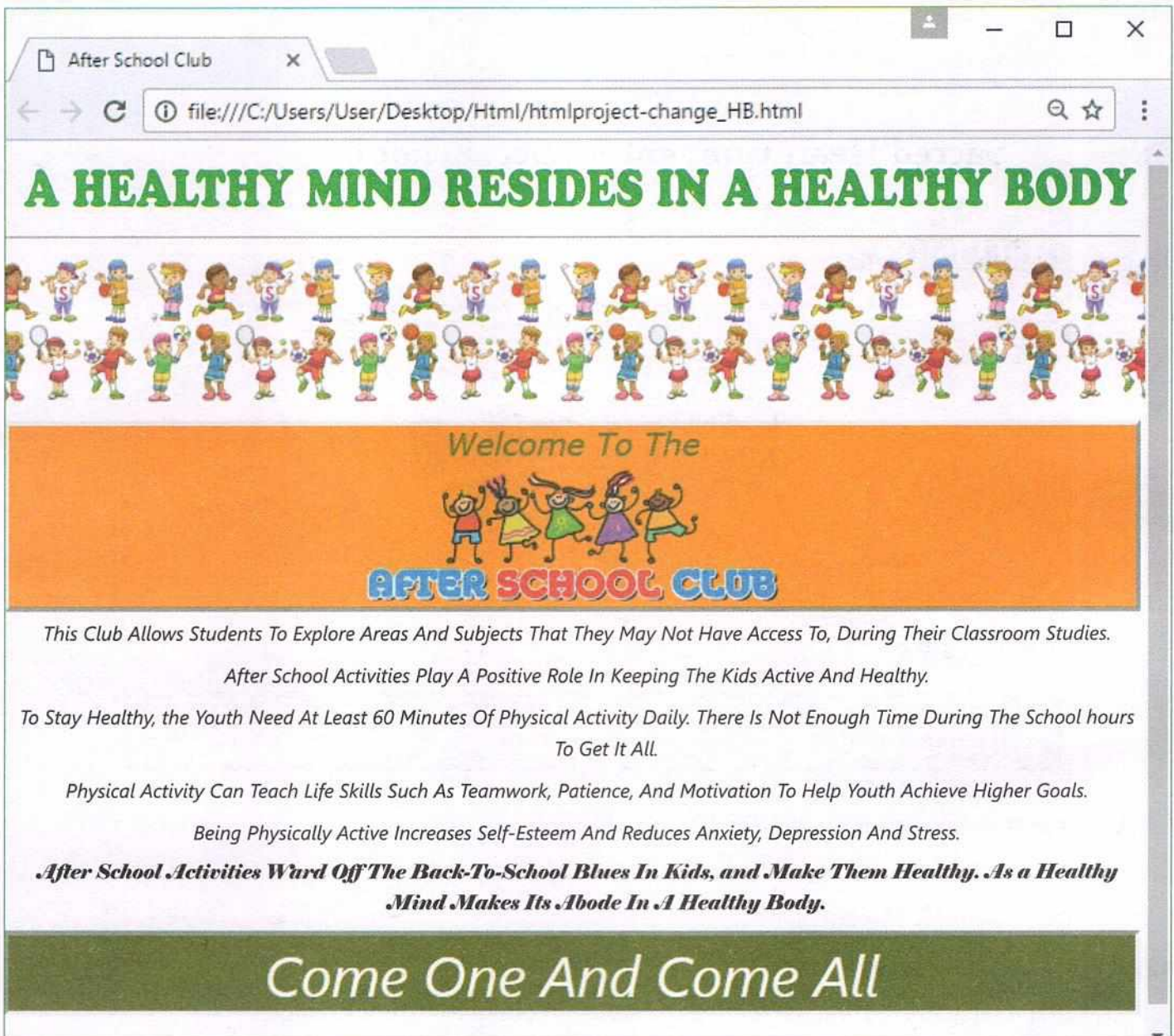
- Give title to the web page as 'After School Club'.

- Using Style Sheet rules, apply Heading level 1 to the text 'A HEALTHY MIND RESIDES IN A HEALTHY BODY ', center align it, set the font-family to, Cooper Std Black, font-color to green, font-size to 600%. The heading should be in uppercase.

- Set the background image and repeat it horizontally.

- Position the image as per the given figure.

- Insert one horizontal rule.

- Using required Style sheet rules, enter the text for the given paragraphs. All the paragraphs except the 2nd last one are having font-family as 'Segoe UI'. The 2nd last one has font-family as 'Elephant'.

ROBOTICS

> Robotics and other combinations will make the world pretty fantastic compared with today.
>
> *- Bill Gates*

A **robot** is a machine which is programmed by a computer and can carry out a complex series of actions automatically. The control of Robots can be done by an external control device or from within the Robot itself. Robots can be designed in human form, but most of the robots are machines designed to perform a task with no regard to how they look.

Robot Vs Automatic Machines

"Carrying out complex actions automatically" is the key element of Robotics but it is also true for many other machines like washing machine, microwave, dishwasher, etc. However, washing clothes cannot be considered a complex series of action. But, flying a plane on auto-pilot mode definitely consists of a complex set of steps. Thus, we have so many machines which are at the cusp between automatic and robots.

So, **programmable by a computer** becomes another key element of Robots as many automatic machines are programmed mechanically and are not very flexible. But since computers are found everywhere now, it becomes difficult to use this to distinguish a robot from another machine. **So, how to differentiate between a robot and an automatic machine?**

Well, most of the Robots use **sensors** which can help them adapt their actions to their environment and enable them to carry out complex tasks. Robots can be used in any situation and for any purpose, but primarily they are being used in dangerous environments (including bomb detection and deactivation), manufacturing processes, or where humans cannot survive.

Classification of Robots based on Working Environment

FIXED ROBOTS

These are mostly used in industries with well-defined work environment adapted for Robots and perform specific repetitive tasks like painting parts in a car manufacturing plant. With high capacity sensors, they are also being used increasingly for high-precision surgery.

MOBILE ROBOTS

They move around and perform tasks in large, uncertain environments. They are quite helpful in situations that are not defined in advance and keep on changing over time. They deal with unpredictable entities like humans and even animals. Self-driving cars, vacuum cleaners, and drones are some of the common examples of Mobile Robots. The
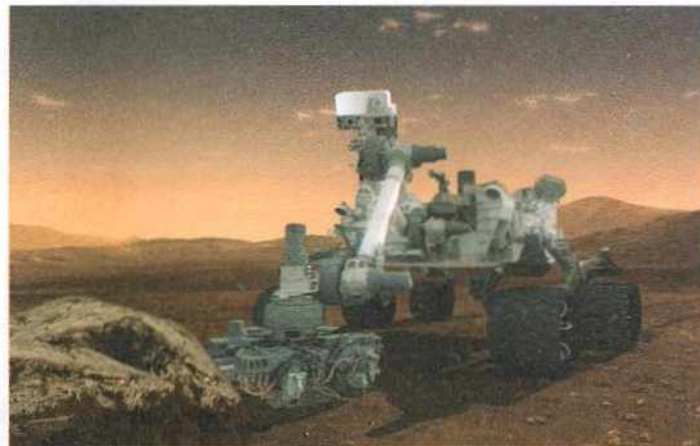
design principles for Mobile Robots will change as per the motion mechanism: Aquatic (underwater), Terrestrial (Cars), and Aerial (drones). However, we also have amphibious Robots that can move, both underwater and on the ground. An operator remotely controls many mobile robots used for pipe inspection, aerial photography, and bomb disposal. Of late, fully autonomous mobile robots have been developed that don't depend on any operator and can take a decision on their own. Self-driving car happens to be the autonomous mobile robot getting the most publicity, although there are mobile robots for even more dangerous and challenging environment, e.g., Space. Curiosity, a car-sized rover, has been active since landing on Mars in 2012.

Classification of Robots Based on Application

INDUSTRIAL ROBOTS

The initial Robots were industrial Robots which were used to replace human workers performing simple and repetitive tasks in a well-defined environment. The simplicity of tasks and the well-defined environment simplified their design process. However, today's industrial robots can manipulate objects in different orientations and can even recognise different objects that need to be packaged in a different order.

SERVICE ROBOTS

The Service Robots have improved sensors and have to interact with humans closely. They are used to assist us in tasks like cleaning (vacuum cleaners), transportation (self-driving cars), defense applications (drones), and medical procedures (surgery) etc.

Robotics

Robotics is a branch of engineering and science that deals with the design, construction, operation and the use of robots, including the design of computer systems for their control, sensory feedback, and information processing. Robotics is used to develop machines that can substitute for humans and replicate human actions.

Most of the research today in Robotics centres around making Robots more autonomous by improving sensors and enhancing intelligent controls. Efforts are on to make the robots more flexible and adaptable towards adapting to new situations based on human interaction and past learning. It requires both sensing and intelligence as well as understanding the psychology and sociology of the interactions.

Sophia is a social humanoid robot with the ability to display more than 50 facial expressions. Developed by a Hong Kong-based company Hanson Robotic, Sophia was activated on April 19, 2015, and made her first public appearance in mid-March 2016 in Austin, Texas, United States.

With the granting of a Visa by Saudi Arab In October 2017, Sophia became the first robot to receive citizenship of any country. In November 2017, Sophia was named the United Nations Development Programme's first-ever Innovation Champion, and the first non-human to be given any United Nations title.

GOOGLE SHEETS ⊞

Google Sheets is a free **web-based spreadsheet application** that allows you to **organise, edit,** and **analyse** different types of information much like **Microsoft Excel**. Using Google Sheets, you can perform calculations with powerful functions and formulas in it similar to other spreadsheet applications. You can also add charts, filters, generate pivot table, and much more it. It contains, has been designed keeping three major features into consideration: collaboration, speed, and convenience. As it is an integral part of Google, Sheets can import all types of data from other Google services and the web at large. Though Excel is the all-time favourite of spreadsheet users, still Google Sheets shines in some of the following areas:

COLLABORATION

Multiple people can work on a spreadsheet simultaneously. Instead of working individually on a spreadsheet and then e-mailing it to other team members for review, Google Sheets lets you share a single file with a group. This simultaneous editing and real-time commenting with others gives you a feeling as if you are across a table with each other, even if you are miles apart.

CLOUD STORAGE

Though you can save your Excel spreadsheets in OneDrive, but in Google Sheets, it gets automatically saved in the cloud and can be accessed from any computer, smartphone or tablet with a browser.

VERSION CONTROL

While using Google Sheets, there is no need to worry about another computer having the same version of Excel as that of yours or switching on between different operating systems, like Windows and Mac.

INBUILT REVISION HISTORY

Google Sheets has an inbuilt revision history that gives a clear and complete information of all the changes and who made them. You can go to **File > Revision History** to see this record and restore your file from any point, if needed.

USEFUL FUNCTIONS

You can translate the contents of a cell using the function **GOOGLETRANSLATE()** or using **IMPORTFEED()** and **IMPORTDATA()** functions, you can get information from the Internet directly into your sheet.

⟫ TO CREATE A NEW GOOGLE SHEET

- ➤ Click on the **Launcher** button ⊞ and select the **Drive** option.
- ➤ The **Google Drive** window will open.
- ➤ Now click on the **New** tab and select the **Google Sheets** option from the drop-down menu.
- ➤ The spreadsheet will appear in a new browser tab with the default name **Untitled spreadsheet** at the top of the page.
- ➤ Click on the **Untitled spreadsheet**, at the top of the page, type a new **name** for your spreadsheet and then press **Enter** on your keyboard.

➤ Your spreadsheet will be **renamed**.

➤ Whenever you need to view or edit your spreadsheet, you can access it again from your Google Drive, where it will be **saved** automatically.

⟫ WORKING IN GOOGLE SHEETS

Each cell can contain various types of content, including **text, formatting attributes, formulas,** and **functions**.

Text: Cells can contain text, such as letters, numbers, and dates.

Formatting attributes: Cells can contain Formatting attributes that change the way letters, numbers, and dates are displayed in a cell.

Formulas and functions: Cells can contain formulas and functions to calculate the values entered in a cell.

SELECTING DATA IN A CELL

➤ To input or edit the cell content, select the cell by clicking on it.

➤ You will notice a **blue box** around the selected cell.

➤ Now enter or edit the data as required.

> You can also select the cells using the **arrow keys** on your keyboard.

	A	B	C	D	E
	Roll No.	Name	Hindi	English	Maths
2	101	Amit	82	75	90
3	102	Surbhi Sharma	72	82	67
4	103	Neha	70	72	76
5	104	Harpreet	79	85	82
6	105	Bhaskar	98	96	89
7	106	Indu	92	85	98
8	107	Hemant	86	95	98

fx 82

fx Name

	A	B	C	D	E
1	Roll No.	Name	Hindi	English	Maths
2	101	Amit	82	75	90
3	102	Surbhi Sharma	72	82	67
4	103	Neha	70	72	76
5	104	Harpreet	79	85	82
6	105	Bhaskar	98	96	89

SELECTING A RANGE

To select a cell range:

➤ Click and drag the mouse until all the cells you want to select are **highlighted**.

➤ Release the mouse button to select the desired cell range.

INSERTING AND DELETING CELL CONTENTS

➤ Select the cell where you want to insert the data.

➤ Type content into the selected cell and press the **Enter** key. The content will appear in the cell and on the formula bar.

➤ Similarly, you can delete cell content by selecting the cell and pressing the **Delete** or **Backspace** key from the keyboard.

COPYING AND PASTING CELLS

➤ Select the cells from where you want to copy the data and press **Ctrl+C**.

➤ Place the cursor on the location where you want to **paste** the data and press **Ctrl+V**.

➤ The copied cells will now have a box around them.

SORTING

Google Sheets allows you to recognise your data by sorting and applying filters to it.

➤ Select the cell range you want to sort.

➤ Click on the **Data** tab and select the **Sort range** from the drop-down list.

➤ The **Sort range** dialog box appears. Select either **A-Z** or **Z-A** and click on the **Sort** button.

➤ The entire data will be sorted according to the selected option.
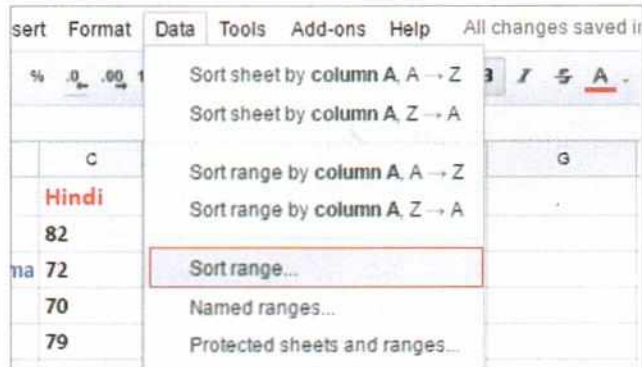
FILTERING

➤ Select the range that contains data. Do not include the column header, go to the **Data** tab and select the **Filter** option or click the **Filter** button ▼ on the **Menu** bar.

➤ The drop-down arrow appears in each column header.

➤ Click the drop-down arrow for the column you want to filter. A drop-down list will appear.

➤ Uncheck the tick marks of those values which you do not want to include in your filtered list. Click **OK**.

➤ The selected range will be filtered accordingly.

You can also filter the data by specifying the condition:

➤ Click on the drop-down arrow for the column which is to be filtered. A drop-down list will appear.

➤ Click on the **Filter by condition** option.
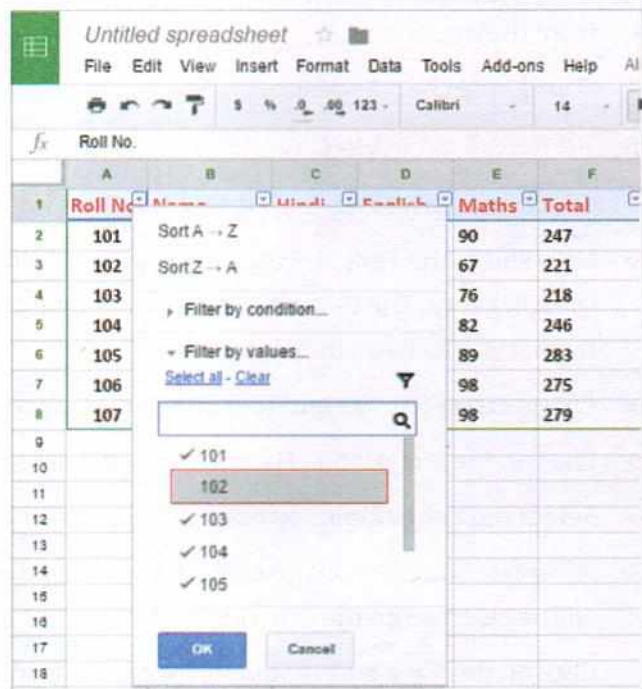
➤ Choose the condition from the spin box and enter the value for the condition. Click **OK**.

➤ The data will be filtered according to the condition.

INSERTING A CHART

➤ Select the range.

➤ Click on the **Insert** tab and select the **Chart** option.

➤ The **Chart Editor** window will appear.

➤ You will observe that **Recommendations** option is selected by default and the recommended chart according to the range you have selected, will be displayed on the right side of the **Chart Editor** window.

➤ Click on the **Chart types**. The list of available categories for the charts will be displayed. Choose the desired category from the list.

➤ Format the chart as desired.
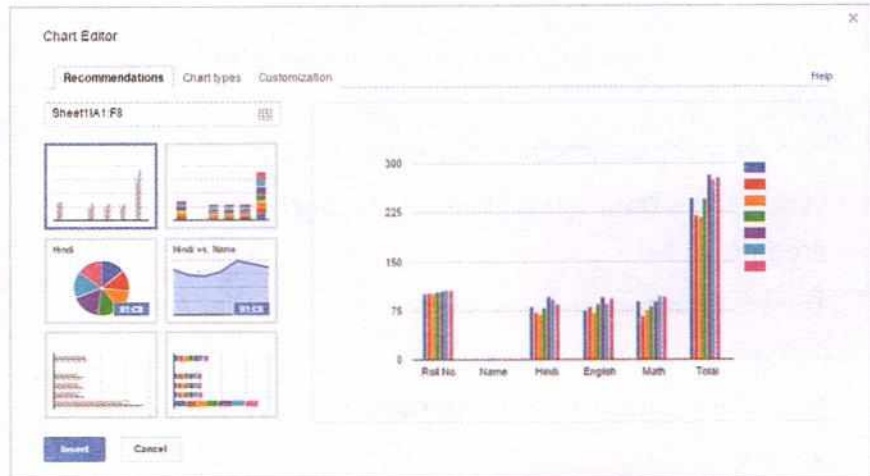
INSERTING A DRAWING

➤ Click on the **Insert** tab and choose the **Drawing** option.

➤ Now select the **Text box** tool and drag the mouse pointer on the Drawing area. The text box will appear alongwith its associated formatting tools on the **Menu** bar.

➤ Change the Font size and Text color and type the text.

➤ Click on the **Image** tool. The **Insert image** dialog box will appear.

➤ Select the **Your albums** option to choose an image.

➤ After selecting the image click on the **Select** button. The image will be inserted on the Drawing area.

➤ Click on the **Save & Close** button to close the **Insert image** dialog box.

➤ The image will appear on the spreadsheet.
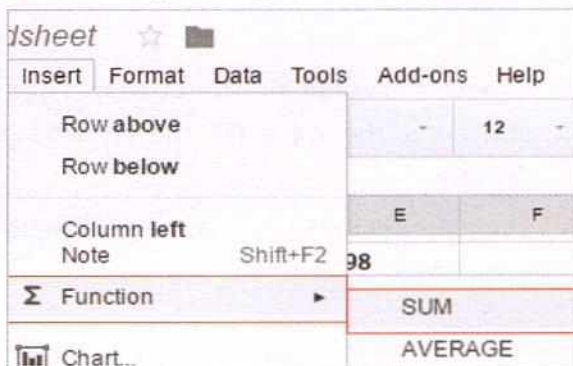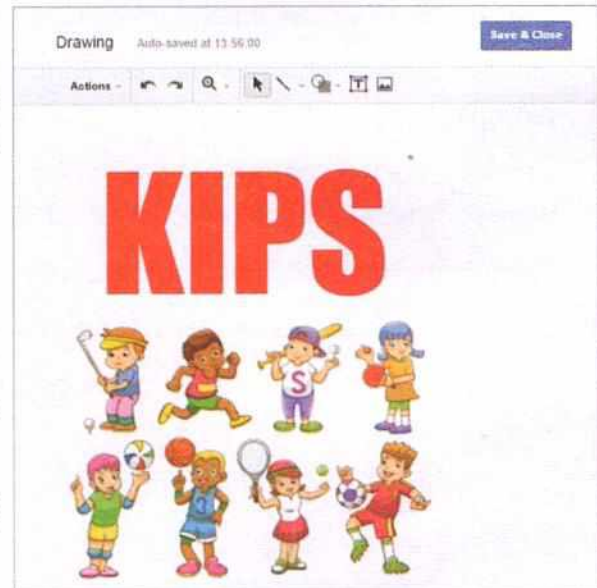
APPLYING FUNCTIONS

➤ Place the cursor on the cell where you want the result of the function to be displayed.

➤ Click on the **Insert > Function** option.

➤ Select the desired function from the cascading menu.

➤ Select the range. The selected range will get highlighted in the column where the result is to be displayed.

➤ After selecting the range, press the **Enter** key.

➤ The calculated result will appear in the selected cell.

⮞ CREATING A FORM

Form helps you in creating and analysing surveys right in your web browser. Form is an inbuilt feature of Google Drive, which is used to collect information from a group of people, giving you flexibility with the questions you ask, and helps in performing quick assessments.

For example : A teacher can assess student's learning and progress before, during, and after a lesson, collect observational data on student classroom work, survey staff, and students for feedback on school matters and so on. It can be shared with a link or via email. You can create a form with Google Drive or from an existing spreadsheet that can record your responses to your form. To create a form in Google Sheets:

➤ Open an existing spreadsheet and click on the **Insert** > **Form** option or select **Tools** > **Create a form** option.

➤ A message will be displayed at the top of the page notifying you that a new form has been created. Click on the **Add question here** option. A new window will open named as **Untitled spreadsheet**. Place the cursor on the **Untitled spreadsheet** and type a new name for the spreadsheet.

➤ Click on the **Color Palette** to change the background color or theme of the form.
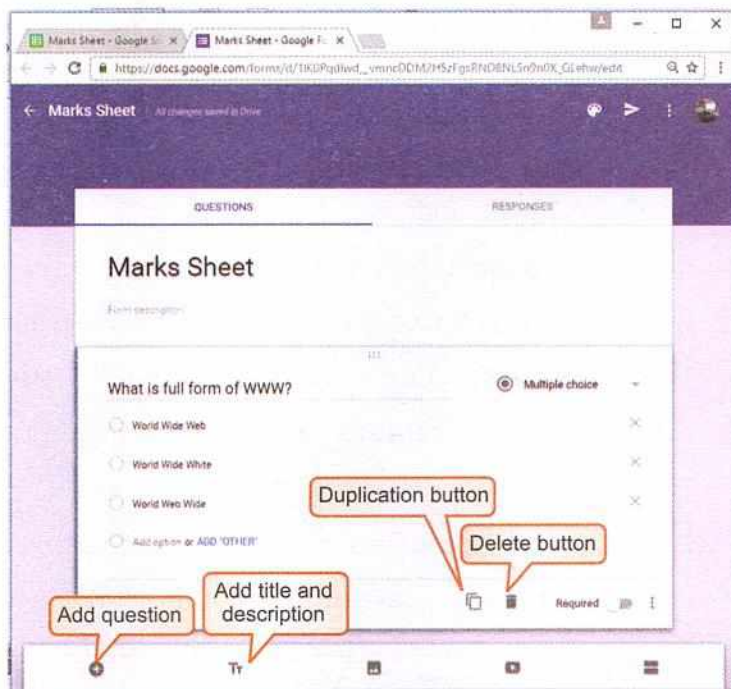
> To apply any theme, click on the **theme** button ⊞. The **Select Theme** window will open. Choose the desired theme from the available list in the Navigation Pane and click on the **Select** button. The selected theme will be applied to the form.

➤ Click on the **Untitled Questions** and type the question.

➤ Click on the drop-down arrow adjacent to it and select the type of a question from the list. By default, **Multiple Choice** type is selected.

➤ Enter the options for the answer by clicking on **Options1**. Likewise, enter 3 more choices by selecting the **Add option** or **ADD "OTHER"** option.

➤ To add more questions into the form, click on the **Add question** button ⊕ and repeat the above step.

➤ You can also click on the **Duplicate** button ⧉ to copy the question.

➤ The same question will be pasted. To modify the duplicated question, click on it and type the new question.

➤ To delete a question, click on the **Delete** button ▮ present at the bottom.

- To reorder your questions or the options within a question, drag them to a new location.
- To add title in a form, click on the **Add title and description** button Tr .
- To preview your form, click on the **Preview** button 👁 .

💡 **Tips**

You can also add image and video into a form by clicking on the **Add image** 🖼 or **Add video** ▶ buttons respectively.

- To add people in the group, click on the **More** menu and select the **Add collaborators** option. You will get the **Sharing settings** window.
- In the **Invite people** section, enter any user or group e-mail addresses you want to share your form with.
- Click on the **Send** button and then click on the **Done** button.
- The persons whom you have added in the group will receive an e-mail with a link to your form.
- To view the responses, go to the **Responses** tab present on the form.
- Enable the **Accepting Responses** option.
- Click on **Create Spreadsheet** button 🟩 to create a new sheet.
- Click on the **View responses in Sheets** button to send the responses to a spreadsheet.

NOTE

- You can also create a form in Google Drive by selecting the **Google Drive > New > More > Google Forms**. Or

  Visit the website **docs.google.com/forms** and click on the **Blank** thumbnail. A new blank form named as **Untitled form** will open in the **Forms** window. You can customize the form in the same way as discussed above.

- You can also access predesigned templates from the same window. To access more templates, navigate through the **TEMPLATE GALLERY** and choose any template of your choice.
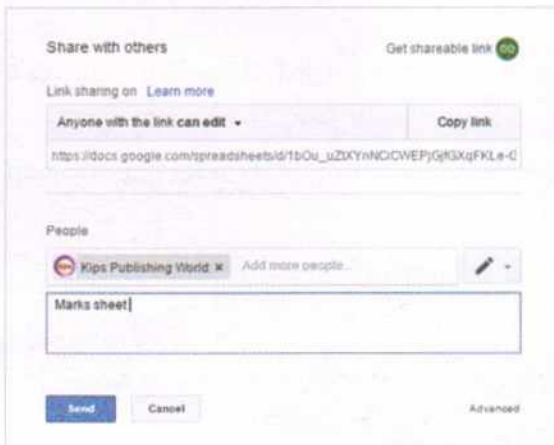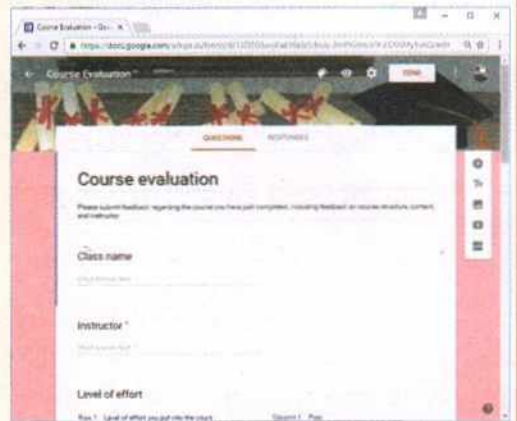
SHARING YOUR GOOGLE SHEET

- Open the spreadsheet and click on the **Share** button.
- The **Share with others** dialog box appears.
- Type the e-mail addresses of the people with whom you want to collaborate on the spreadsheet.
- Select the authorization from the list and click on **Send** button.

QUICK GLIMPSE OF OFFICE 365

Office 2016 suite contains applications, such as Word, Excel, PowerPoint, and Outlook, which are available as a one-time purchase for use on a single PC.

Office 365 is a suite of services offered by Microsoft. It is a web based subscription service, where you have to pay a monthly or yearly fee to avail the various services it provides. Office 365 subscription plans include, Office 365 Home, Office 365 Personal, Office 365 University, Office 365 for Mac, Office 365 for Business, etc. With each plan, you can install the 2016 versions of Word, Excel, PowerPoint, Outlook, and OneNote (Access and Publisher are also included for PC users).

With the subscription of Office 365, you get:

➤ The latest version of Office applications that is updated regularly, as and when a new version is released. Office 365 can be installed on up to five devices.

➤ One Drive cloud storage (free up to 1 TB) enables you to store all the documents in one place and allows you to access these documents at anytime and anywhere. Therefore, it is easier than ever to create, edit, and share the documents at one go.

➤ Free 60 minutes of Skype calling per month, which will help you to stay in touch with your friends around the globe.

➤ Office Mobile Apps to get the things done on any device – PCs, Macs, tablets (including iPad and Android tablet).

⋙ KEY FEATURES OF OFFICE 365

Work smarter with the built-in Word Researcher and Editor

Researcher feature helps you to find and use the content, related to your topic, right within your Word document. It uses the Bing Knowledge Graph to extract the relevant content from the web and provides safe and credible information.

The Editor feature, on the other hand, provides intelligent suggestions for proof-reading and editing as you type in a document.

Find the right command in seconds with Tell Me

It is easier than ever to find the feature you need. Just type what you want to do in the intelligent "Tell me what you want to do" search box and go directly to the command you need.

Put your best foot forward with PowerPoint Designer and Morph

PowerPoint Designer is an intelligent, built-in tool that helps you to create high-quality slides in seconds. The new Morph transition effect creates cinematic motion in one click, seamlessly animating between the slides.

Keyboard, touch, or pen - it works the way you do

Touch and inking capabilities give flexible options for reviewing, editing, and presenting the views.

N OneNote

Organise and Share Your Work

OneNote is a digital notebook that helps you in making quick notes either handwritten or typed. It provides you with the flexibility to assemble and organise your notes, images, audio, and video clippings together in one location on your computer. You can share your notebook with anyone you desire and work on your projects also at the same time.

S SharePoint

Keep Projects Together

It is a platform, offering different services. You can use SharePoint to store and organise documents and collaborate with anyone in real time. You can sign-in to SharePoint from any device, like desktop or mobile phones and can use it to have access to any information.

Skype

Connect and Stay in Touch

It is the most popular application used for making voice and video calls on the Internet. Skype to Skype calls are always free but you can also use Skype to call mobile phones and landlines at affordable rates. You can also use it for instant messaging or chatting.

yammer

Connect across your Company

It is a private social network within a company or an organisation that allows the team members to share information, to have group discussions, and build a body of knowledge that is instantly accessible by any co-worker at anytime and anywhere.

S Sway

Turn your Ideas into Stories

It helps in creating and sharing dynamic and interactive reports, presentations, newsletters, and personal stories. The built-in design templates help to enhance its look. It also provides you with a safe browsing tool to search relevant images, audio clips, videos, and other contents that you can drag and drop right into your creation. It is extremely easy to share a Sway with your family and friends without signing in or downloading additional software. Sway for Windows 10 is available for download in the Windows Store.

D Delve

Discover exactly what you need

Microsoft Delve, previously code-named "Oslo", helps you in searching your e-mails, meetings, contacts, social networks, and corporate documents stored across Office 365. It uses "machine learning" artificial intelligence to provide you with the stuff you need to see. You do not have to remember the title of a document and its location. Delve brings the right information to you proactively based on what you are working with. It shows you the documents no matter where they are stored in the cloud but you can only see the content that has been shared with you.

Office lens

A Scanner in the Pocket

➤ Office Lens, one of the incredible apps available with Office 365, acts like a scanner and makes digital copies of the captured printed documents, business cards, posters, etc.

➤ One can also use it to take pictures of the notes from whiteboards or blackboards in the classroom or meeting. This app digitises these pictures and helps in cropping and refining their quality to make them clear and readable.

➤ This app provides the option to convert the captured images to PDF, Word, or PowerPoint files, which are automatically saved to OneDrive. Besides that, the images can be saved to OneNote or on the local drive of the device also.

➤ It makes use of OCR technology (Optical Character Recognition) to recognise the printed or handwritten text so that one can search for words in images and then copy and edit them.

Office Remote

Turn your Phone into a Smart Remote

➤ Office Remote is another free app, which turns your phone into a smart remote that interacts with Word, Excel, and PowerPoint files on your PC.

➤ **In PowerPoint:** You can start the PowerPoint presentation, move to the next slides, check out the speaker notes, view slide thumbnails and jump to a slide, play and pause the embedded audio and video files, etc.

➤ **In Word:** You can scroll through a Word document, jump to headings and comments section, change the zoom levels, screen up and down, etc.

➤ **In Excel:** You can switch between worksheets, move up and down the worksheet, change the zoom level, etc.

➤ This app works both with Windows as well as Android phones.

Smart Forms 365

Convert your Paper Forms into Mobile Forms

➤ It is a data collection app, which facilitates in creating professionally looking forms.

➤ It supports various templates to make the form design user friendly and attractive. It works in offline mode also.

➤ After creating forms, you can collect data through various means, such as sharing web link with desired users, sharing the code with other Smart Forms 365 users, etc.

➤ Filled data can be easily exported to other formats so that it can be reused.

➤ Filled forms can be sent to OneNote, with the result the forms can be viewed on multiple devices.

➤ It can be used to create short courses, assessments of mark sheets, surveys, take structured notes, lesson plan. Medical professionals can use it to record Patient's medical history, Trainee assessments, etc.

LOGICAL REASONING

1. Which of the following options will complete the given series?
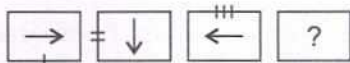
   (A)   (B)

   (C)   (D)

2. If TOGETHER is written as RQEGRJCT, then how will PAROLE be written?
   (A) NCPQJG   (B) NCQPJG
   (C) RCPQJK   (D) RCTQNG

3. In the given figure, the triangle represents girls, square represents sportspersons and circle represents coaches. Which portion of the figure represents girls who are sportspersons but not coaches?
   (A) P
   (B) Q
   (C) R
   (D) S
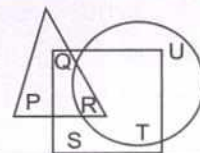
4. Five boys A, B, C, D and E are standing in a row. A is between C and D and B is between D and E. Which of the following pairs represents the boys standing at both the ends?
   (A) C, B   (B) E, C
   (C) E, A   (D) A, C

5. A man goes towards east five kilometres, then he takes a turn towards right and goes five kilometres. He again takes a turn towards right and goes five kilometres. With respect to the point from where he started, where is he now?
   (A) East   (B) North
   (C) West   (D) South

COMPUTERS AND INFORMATION TECHNOLOGY

6. MBP is a short form for a famous high end notebook from Apple. It is called _____.
   (A) Macintosh Book Pro
   (B) Mac Book Programmable
   (C) Mountain Book Pro
   (D) MacBook Pro

7. You can join an Active Directory domain in which of the following Windows 7 versions?
   (i)   Windows Home Edition
   (ii) Windows Professional Edition
   (iii) Windows Ultimate Edition
   (iv) Windows Enterprise Edition
   (A) Only (i) and (ii)   (B) Only (iv)
   (C) Only (ii), (iii) and (iv)
   (D) All of these

8. The function of 'Wrap Text' icon in MS Excel is used to _____.
   (A) Join selected cells into one larger cell
   (B) Rotate text to a diagonal angle
   (C) Make all content visible within a cell by displaying it on multiple lines
   (D) Highlight interesting cells

9. Match the following terms with what they stand for

Term		Stands for
(i) .com	(a)	Education
(ii) .edu	(b)	India
(iii) .in	(c)	Australia
(iv) .au	(d)	Commerce

(A) (i)-(a), (ii)-(b), (iii)-(c), (iv)-(d)
(B) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)
(C) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)
(D) (i)-(d), (ii)-(a), (iii)-(b), (iv)-(c)

10. A browser is an interactive program that permits a user to view web pages on the computer. The browser performs which of the following services?
(A) Connecting to the source computer whose address is specified
(B) Requesting new page from the server
(C) Receiving new page
(D) All of these

11. Modern Computers compared to earlier computers are _____.
(A) Faster and larger   (B) Less reliable
(C) Larger and stronger   (D) Faster and smaller

12. In MS-Word, which shortcut key is used to increase the font size of text?
(A) Ctrl + F   (B) Ctrl + Alt + F
(C) Ctrl + Shift + >   (D) Ctrl + Shift + X

13. Match the virus types given in Column-I with their corresponding examples given in Column-II.

Column-I		Column-II
(a) Macro Virus	(i)	Lamer Exterminator
(b) Boot Sector Virus	(ii)	Natas
(c) Polymorphic Virus	(iii)	Melissa

(A) (a)-(iii), (b)-(i), (c)-(ii)
(B) (a)-(i), (b)-(ii), (c)-(iii)
(C) (a)-(ii), (b)-(i), (c)-(iii)
(D) (a)-(iii), (b)-(ii), (c)-(i)

ACHIEVERS SECTION

14. Match the following output devices given in Column-I with their descriptions given in Column-II.

Column-I		Column-II
(a) Voice Response System	(i)	It produces audio output by selecting an audio output from a set of pre-recorded audio response.
(b) Voice Reproduction System	(ii)	It enables a computer to talk to a user.
(c) Speech Synthesizer	(iii)	It converts text information into spoken sentences.

(A) (a)-(ii), (b)-(i), (c)-(iii)
(B) (a)-(i), (b)-(ii), (c)-(iii)
(C) (a)-(iii), (b)-(ii), (c)-(i)
(D) (a)-(i), (b)-(iii), (c)-(ii)

15. Which of the following QBASIC codes will produce the given output?
Output:
1
2
3

(A) FOR x = 1 TO 3
    PRINT x
    NEXT x

(B) FOR x = 1 TO 5
    PRINT x
    NEXT x

(C) FOR x = 1 TO 3
    PRINT x
    EXIT FOR
    NEXT x

(D) FOR x = 1 TO 3
    PRINT x
    EXIT FOR
    MORE x

16. If your cell shows 100, then the formula bar could show.
(A) one hundred
(B) =50*2
(C) 50x2
(D) Nothing