COMPUTER SCIENCE

(For Class – XI)

K3E1G9

ਇਹ ਪੁਸਤਕ ਪੰਜਾਬ ਸਰਕਾਰ ਦੁਆਰਾ ਮੁਫ਼ਤ
ਦਿੱਤੀ ਜਾਣੀ ਹੈ ਅਤੇ ਵਿਕਰੀ ਲਈ ਨਹੀਂ ਹੈ।

Punjab School Education Board

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FOREWORD

The Punjab Curriculum Framework (PCF 2013) which is based on National Curriculum Framework (NCF) 2005 recommends that the child's knowledge must be connected to their life outside the school. It indicates a departure from the legacy of bookish learning and ensures that learning is shifted from rote methods to activity based learning and also provides an opportunity for the holistic development of the students.

Over the years, Computer Science as a discipline has evolved and emerged as a driving force for socio-economic activities. Computer technologies are widely used in diverse areas of modern life such as education, business, health, transport and all other sectors also. With the advent of computer and communication technologies, there has been a paradigm shift in teaching at the school level. The role and relevance of this discipline is in focus because the expectations from the school pass-outs have grown to meet the challenges of the contemporary world. Today, we are living in an interconnected world where computer-based applications influence the way we learn, communicate, commute or even socialise in day to day life.

Keeping in view these requirements, Punjab School Education Board has introduced Computer Science as a compulsory subject from class 6th to 12th as per guidelines of Punjab Government. Every effort has been made to include each requisite information according to level of class 11th in this book. I hope it will be useful for students and teachers.

This book focuses on the fundamental concepts and problem-solving skills while opening a window to the emerging and advanced areas of computer science. The newly developed syllabus has dealt with the dual challenge of reducing curricular load as well as introducing this ever evolving discipline.

Punjab School Education Board welcomes and look forward to feedback and suggestions for the improvement of its subsequent editions.

Chairman

Punjab School Education Board

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WEB DESIGNING WITH HTML & CSS

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INTRODUCTION

Web design is the process of creating websites. It includes several different aspects, such as webpage layout, content production, and graphic design etc. Websites are created using a markup language called HTML. Web designers build webpages using HTML tags that define the content and metadata of each page. The layout and appearance of the elements within a webpage are typically defined using CSS. Therefore, most websites include a combination of HTML and CSS that defines how each page will appear in a browser.

Some web designers prefer to hand code pages (typing HTML and CSS from scratch), while others use a WYSIWYG (What You See Is What You Get) editor like Adobe Dreamweaver. This type of editor provides a visual interface for designing the webpage layout and the software automatically generates the corresponding HTML and CSS code.

We have studied about basics of HTML and CSS in the previous class, i.e. in 10th class. In this chapter, we are going to discuss about the basics of web designing, some advanced topics of HTML and CSS along with the Open Source Editor - Notepad++.

1.1 WHAT IS A GOOD WEB DESIGN?

A website is created for the purpose of sharing information with the general public. Therefore, the success of a website depends on its design, content and speed. Webpage design is a very important element. The website is used in different parts of the world and in different parts different language is written, spoken and understood around the world. So the wording and the language used on the website are very important for ordinary people to understand. In order to create a good website design, we need professionals from different fields. There are 8 important principles for a good website design.

- **Simplicity :** The clean and fresh design for a website should be preferred. This reduces the loading time of the website and makes it easier to update, edit website in future. The design of the webpage should be simple and its navigation should be easy.
- **Consistency :** The design of every webpage in the website should be consistent. All webpages should have the same buttons, colors, and navigation design so that they are easy to use and understand.
- **Typography & Usage Text :** The text on the website should be clean and readable so that the search engine will be able to index the webpages. In webpages the headings etc. should be alike. Language should also be used in such a way that online webpage translators can easily translate the webpage into another language.
- **Multidivisional Design :** Now a days due to the increasing use of different size of display screens in smartphones and tablets, web design should be in such a way that content of web page will get properly displayed and easily used on screens of different sizes.
- **Pictures, Videos and Audio :** When designing a website, proper images, video and audio should be used at the appropriate place. Generally, people prefer to read text less and prefer to listen and watch audio or video but it should also be noted that the size of the webpage is not heavy and loading time is not excessive.
- **Communication and Address :** The website should be designed in such a way that the right place (such as a new webpage or block) should be set for different information. The URL of the webpages containing special information should be easy so that it can be remembered. There should be features to convey updated information to the website-visitors so that for new information they will be able to visit the website again.
- **Social Sharing Feature :** Today is the time for social networking and the information that users find interesting, they like to share using social media. Therefore, every section of the website should be so designed that the information available on the website can be easily shared.

- **(F) Design :** It has been learned from deep research that ordinary users scan webpages (computer screens) in an "F" pattern. At the first glance is rarely seen on the right side of the screen. This kind of design means looking at the webpage from left to right and top to bottom, which is what most users prefer. It is same as English alphabet "F".

1.2 THE PHASES OF WEBSITE DEVELOPMENT

There are 6 major steps (important steps) in website design and development process. These steps go from collecting initial information, to building a fully functional website and finally to do maintenance to keeping the web site up to date.

1. Information Gathering
2. Planning
3. Design
4. Development
5. Testing and Delivery
6. Maintenance

1.3 HTML CONCEPT

As we know that HTML (HyperText Markup Language) is the main markup language for web pages. It provides a means to create webpages with text, lists, pictures, videos, audio, tables, frames, headings and more. It also provides the convenience of collecting information by creating forms. All of this is done through special commands called tags. HTML provides the ability to add or load scripts in other languages like Java Script. The design of websites and webpages can be created very effectively using Cascading Style Sheet (CSS). So html is capable of creating basic and advanced webpages.

There are usually two types of tags in HTML:

- **Paired Tags :** These tags contain the opening tag < > and closing tag < / >.
- **Singular Tags :** These tags do not need to be closed.

1.4 HTML'S ROLE IN THE WEB

HTML is the default language for designing websites. HTML code is used to design static webpages. This code is understood by the web browser and displayed by making it viewable. HTML is used to organize text, images and other webpage elements into a webpage. If you use the view source code option in the web browser, you will see the html code. Using this code the webpage is created. So html has a very important role in the web and without it the web would not be possible.

1.5 STRUCTURE OF HTML DOCUMENTS

Following is a simple example of HTML program. Every HTML webpage has such code. Every HTML document begins with the <html> tag and ends with </html> tag. HTML documents are mainly divided into two parts: head part and body part. Let's learn about the code given below in the figure 1.1:

```
<!DOCTYPE html>
<html>
    <head>
    <title>Web Designing</title>
    </head>

    <body>
    Welcome to the world of HTML and CSS
    </body>
</html>
```

Figure 1.1 Simple Example of HTML program

<! DOCTYPE html> : This tag describes the version of html. It shows that the HTML document is going to use version 5 of html.

Head Part : This part begins with the <head> tag and ends with </head> tag. This part includes information about header details of the HTML document, for example: page title, information about meta-data etc. Meta-data refers to other information related to the data available in the html page.

Body Part : This part begins with the <body> tag and ends with </body> tag. This tag contains all the information that will be displayed on the webpage, i.e. visible to the web user.

1.6 HTML EDITOR

As we studied in the previous class, for making web pages using HTML, we require any simple text Editor, such as Notepad (a built-in text editor of windows) etc. Although, there are many advanced text editors that are available in the market for programming in HTML. Notepad ++ is one of such free and powerful code editor. It provides support for writing source code using many programming languages. Using this editor, we can write the coding of the HTML and CSS easily. It can be downloaded for free from the Internet (website: https:// notepad-plus-plus.org/). It has the convenience of Tabs and we can edit & work with multiple files at the same time. Following figure shows the interface of Notepad++ Editor.

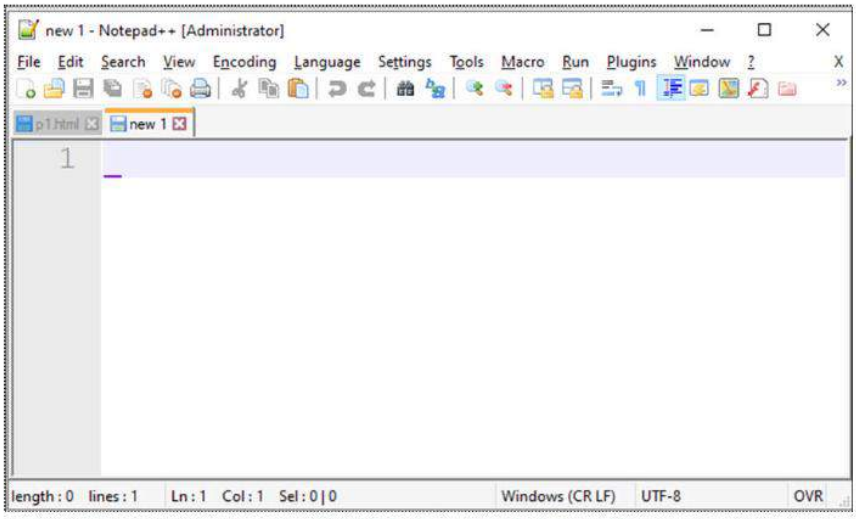


Figure 1.2 Main Window of Notepad++

To view the output of HTML program, we have to open it in the Web Browser. If we prepare HTML web page in the simple text editors, then we have to open that web page manually to view it in the web browsers. But in the case of Notepad++, we can do it within the Notepad++ interface. To preview the html code in the web browser, we can follow the steps given below:

- Click on the View Menu.
- Click on the "View Current file in" to open the submenu.
- Now, click on the desired web browser that is listed in the submenu, to view the output of HTML program.

We can also view the output of HTML program by right clicking on the tab and select Open in Default Viewer.

Now, let's begin by making a simple example of time table using Notepad++. Follow the steps given below for the example:

- Open Text Editor Notepad++.
- Create a new file by clicking on File → New or by using the shortcut key Ctrl+N.
- Now start typing HTML code as shown the example below:

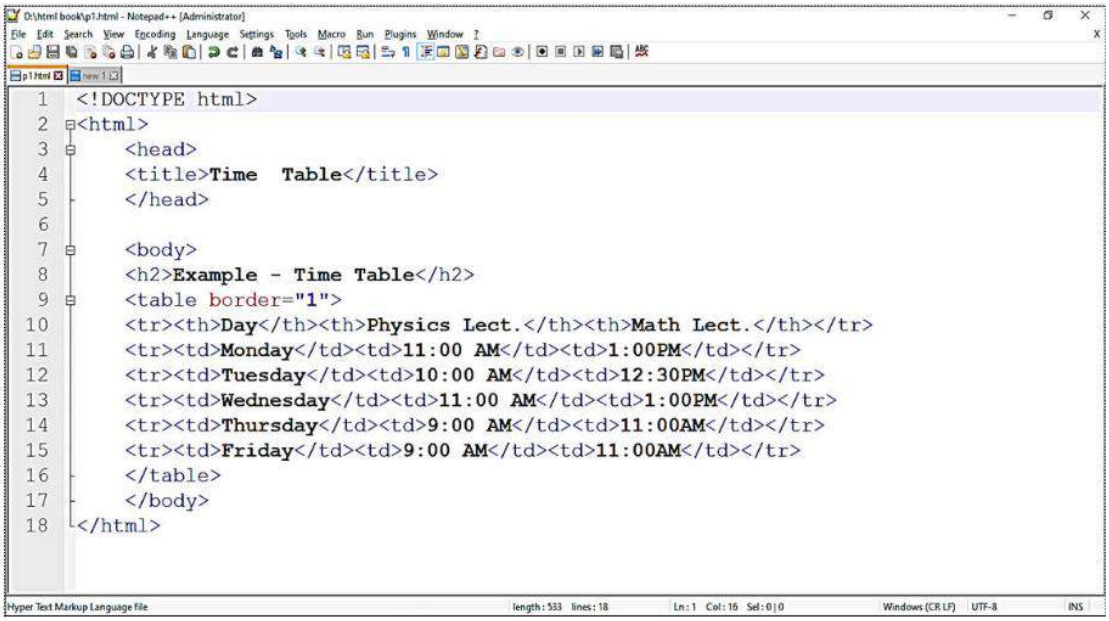


Figure 1.3 Notepad++ with Sample Time Table Program

After completion of above code, now save it using File → Save or using shortcut key Ctrl+S. Make it sure to type the extension (.html) of HTML web page after typing the file name, i.e. filename.html (for example: p1.html).

To view the output of above web page, right click on the file tab and click on the option "Open in default Viewer". It will open the web page in the default web browser as shown below:

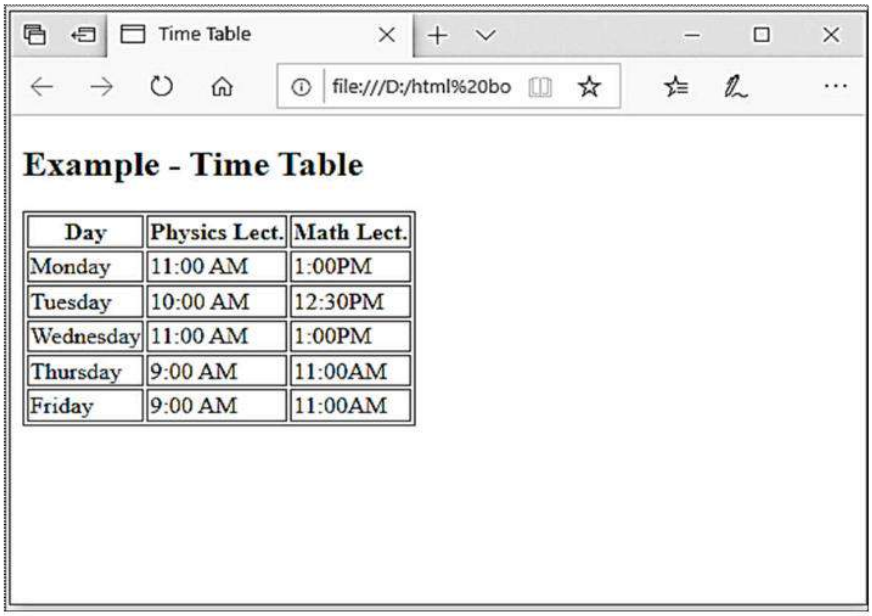


Figure 1.4 - Output of Sample program given in fig 1.3

1.7 WORKING WITH LINKS AND IMAGES

Links and images play an important role in the world of web. The links in the HTML are called hyperlinks. The text with hyperlinks is called Hypertext. By default the link color is blue and they are underlined. We can navigate to another webpage by clicking on the link. Usually when the mouse pointer is moved over the link it will change to a hand pointer. It can be inferred that this is the link and a click can be made to use it. Links can be created not only on text but also on an image or other object. Images are used to make the web pages beautiful and more descriptive. Following discussion shows how to work with links and images using the HTML in web pages:

1.7.1 Working with Links

Hyperlinks are created with the <a> tag in HTML. The tag <a> is called anchor tag. We use anchor tag with href attribute. The attribute href is the hypertext reference. It's URL value represents the address of the linked file/page. Basic Link tag is:

link text

There are two main parts of a link tag: the "link text" that a user clicks to open the linked page, and the "Url Address" part which represent the address of page to be linked. In the above code, the href="url" part is the address part of the anchor tag. The different attributes that can be used with the anchor tag are given below:

Attribute	Description
href	It specifies the destination address of the link i.e. which webpage or object will get open after clicking on the link. This destination address can be a webpage, an image, video, audio, or even some kind of file.

target	Indicates that the new webpage opens in a new window or in the same window after clicking the link. Some of the values are: _blank, _self, _top, _parent
Link Text	This is used to show the title of the text link. It's written between the opening <a> tag and closing tag.
title	It is used to refer to the tool tip for link. When the mouse pointer is held over the link for some time, the text inside it appears as a tool tip.

Table 1.1 - Attributes of anchor tag

Following program shows how to use anchor tag in the web pages:

Figure 1.5 - HTML Code for creating Hyperlinks and Its output window

1.7.2 Working with Images

Images can be used as a background of web pages or they can be used as an object in the web pages. Proper usage of images make the websites more attractive. The <img> tag is used to insert the image as an element into an HTML webpages. It is a singular tag. It does not include a closing tag. Following attributes can be used in this tag:

src	src attribute is the source location of the image (address / url). It is used to insert the image into the webpage. If the images on the webpage are in the same folder then only the full name of the image is required. This attribute can also take the value of some external source of website such as address of some other website/webpage.
alt	This is Alternate Text. It only shows up on the webpage when the image is taking too long to load or the image is missing.
title	It is used to refer to the tool tip for images. When the mouse pointer is held over the image for some time, the text inside it appears as a tool tip.
Width, height	These attributes are used to indicate the width and height of the image.

Following code shows how to insert image in the web page:

```
<!DOCTYPE html>
<html>
<head>
<title> </title>
</head>
<body>
<img src="flower.jpg" alt="Image of Flower" width="400" height="500">
</body>
</html>
```

Figure 1.6

Images can also be used as link buttons. If we want to create a link using the image then the <img> tag can be used. It's written between the opening <a> tag and closing tag. As shown in the example below:

<img src= "pseb.jpg" width= "40" height= "20">

1.8 STYLE SHEETS

Cascading Style Sheet, also known as CSS, is a simple design language used to make web pages-design simple and effective. Where CSS is easy to learn and understand. It is commonly used to build websites with html. CSS determines how HTML elements should be displayed.

CSS is used to improve the look & feel of a web page. Using CSS we can make changes to the text colors, font categories, paradigms, columns, images, layout design, display size for different devices and screens, and many more design and design elements.

1.8.1 Benefits of CSS

- **Time saving -** CSS code can be used repeatedly as needed and then the same sheet can be reused in multiple HTML pages.
- **Speed (fast webpage loading) -** CSS requires less code for formatting in html, which increases the speed of webpage creation and loading code in webpages browser with less code typing. Also decreases the size so the webpage has a light weight design.
- **Easy Maintenance -** Changes to CSS coding in one place automatically apply changes everywhere, means that the entire web page's contents can be changed on the page and that it doesn't have to change the main web coding which also reduces the chance of errors.
- **More Powerful -** Webpages can be designed in a much better and simpler way using CSS. It has more features than html.
- **Multiple Device Support -** Using CSS, webpages can be easily made to display correctly on different screen size devices and using CSS, one can create different versions of the website for different devices.

1.9 TYPES OF STYLE SHEETS (CSS)

There are 3 common ways to use CSS:

a. Inline style : It is used in the html tag. Example:

```
<p style = "color: red; border: 2px solid;"> This is an inline css example. </p>
```

b. Internal style sheet : It is used for a webpage whose coding is written in the <head> tag. Example:

```
<head>
    <style> p {color: red; border: 2px solid; } </style>
</head>
```

c. External style sheet : This is used by creating a separate file. All coding is done in this separate file and its extension is .css. This file can be used to style webpages by linking to multiple webpages as needed. When a formatting change is made to this file, the change will be reflected across all linked webpages. We use the <link> tag in the <head> section of the webpage to link to this file. Ex:

```
<head>
    <link rel = "stylesheet" type = "text / css" href = "mystyle.css">
</head>
```

External style sheets can be written in any text editor. The css file must not contain any html tags. Below is the style sheet file:

CSS Filename: "myStyle.css":

```
p {
color: red; border:2px solid;
}
```

1.10 CSS SYNTAX

The CSS rule-set consists of a selector and a declaration block:

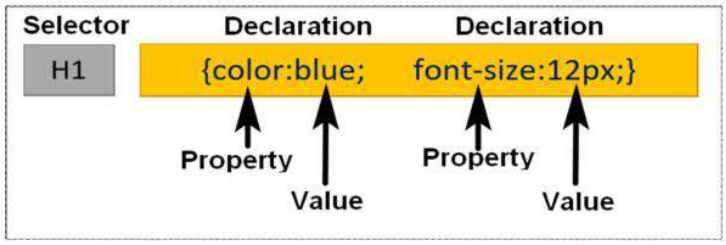


Figure 1.7

- **CSS Selector :** This is used for the element whose style we want to format.
- **CSS Declaration :** This is used to set the element's properties and each property is terminated with a semicolon (;). There are several properties that can be used in the declaration block. This can be interpreted as an html tag attribute.

1.11 CSS SELECTORS

Selectors help us to select and format html elements. Id, classes, types, attributes etc. can be used for selectors.

1.11.1 The Element Selector

Element selector is used to select or format html elements such as paragraphs. Consider the following example in html web page for a paragraph:

```
<p> This is an example of paragraph in web page</p>
```

If we want to format it using CSS with the help of Element selector, then we have to write it as given following (either using internal style sheet or using external style sheet):

```
p {
  text-align: center;
  color: red;
}
```

1.11.2 The ID Selector

It is used to format the id attribute of the html. We use this selector to format a particular element. It starts with the # (hash) symbol and the name of the element. Consider the following example in html web page for a paragraph:

```
<p id="#para1"> This is an example of paragraph in web page</p>
```

If we want to format it using CSS with the help of ID selector, then we have to write it as given following (either using internal style sheet or using external style sheet):

```
# para1 {
      text-align: center;
      color: red;
}
```

1.11.3 The CLASS Selector

It is used to format the class attribute of the html elements. It starts with dot (.) and the name of the class. Consider the following example in html web page:

```
<p class= "center"> This is an example of paragraph in web page</p>
<h1class= "center"> This is an example of Heading Level 1</h1>
<p class= "center"> This is another example of paragraph in web page</p>
```

If we want to have similar formatting of both of these elements using CLASS selector, then we have to write it as given below (either using internal style sheet or using external style sheet):

```
.center {
      text-align: center;
      color: red;
}
```

1.11.4 Grouping Selectors

These are used to reduce coding and save time. Several elements can be grouped together into a single group whose formatting is same. Consider the following example in html web page:

```
<p> This is an example of paragraph in web page</p>
<h1> This is an example of Heading Level 1</h1>
<h2> This is an example of Heading Level 2</h2>
```

If we want to have similar formatting of all of these elements using Grouping selector, then we have to write it as given below (either using internal style sheet or using external style sheet):

```
h1, h2, p {
    text-align: center;
    color: red;
}
```

1.12 DIFFERENT STYLE SHEET (CSS) PROPERTIES

Now we have come to know how to use CSS in our web pages. Now it is the time to have knowledge about the different properties of CSS. These properties are used to format the different elements of webpages. There are numerous CSS properties to use them in web pages. We are going to discuss them by classifying them into various categories. Following discussion shows these properties with suitable examples:

1.12.1 CSS Background

Background Properties are used to format the background of the webpages or various html elements. Following table shows the common properties of background:

Property	Description
background	Sets all the background properties in one declaration
background-color	Sets the background color of an element
background-image	Sets the background image for an element
background-position	Sets the starting position of a background image
background-repeat	Sets how a background image will be repeated

Examples:

```
p{
background-color: #b0c4de;
}
body {
background-image: url("paper.gif");
```

```
background-repeat: repeat-x;
background-position: right top;
}
```

Separate Background properties can also be written together:

```
body {
background: #ffffff url ("plant.png") no-repeat right top;
}
```

1.12.2 CSS Text

Text properties are used to format text on a webpage. Following table shows the common properties of text:

Property	Description
color	This property is used to set the foreground colour of text
text-align	This property is used to set the alignment of text
Text-decoration	This property is used to specify the decoration added to text. The common values for this property are: overline, underline, line-through

We can write color value in several ways For Example:

Using HEX values : Example: #ff0000

Using RGB value : Example: rgb(255,0,0)

Using color name : Example: red

Text in web pages is aligned left by default. We can also align the text as per our requirement. There are four options for aligning text horizontally: center, left, right, and justified. Following example shows how to use text properties in web pages:

Example:

```
h1 {
color: red;
text-align: center;
text-decoration: underline;
}
```

1.12.3 CSS Fonts

Using these properties, we can set, the font size, style and so on.

Property	Description
Font	Sets all the font properties in one declaration
Font-family	Specifies the font family for text

Font-size	This property is used to set the font size. We can use px or em unit. The World Wide Web Consortium (W3C) recommends the em unit. The size of 1em is 16px and this size is the default font size for web browsers.
Font-style	Specifies the font style for text. This property is commonly used to make fonts italic or oblique. Common values for this property are: normal, italic, oblique
Font-weight	Specifies the weight of a font. Values for font-weight can be: normal, bold, bolder, lighter, number (any numeric value, e.g. 900)
Font-variant	Specifies whether or not a text should be displayed in a small-caps font. Common values used for this property are: normal, small-caps

For Example:

```
p {
font-style: italic;
font-weight: bold;
font-size: 12px;
}
```

Following example shows how to use shorthand declaration for font property on heading h1. Here, font is set to italic and bold, the font size is set to 12 pixels, the line is set to 30 pixels, and the font family is set to Georgia.

```
h1 {
font: italic bold 12px/30px Georgia, serif;
}
```

1.12.4 CSS Links

These CSS properties are used to format the hyperlinks (links). There are four types of links in the webpage:

a: link - It is a normal, unvisited link
a: visited - It is a link the user has visited
a: hover - It is a link when the user hover the mouse at the link
a: active - It is a link the moment it is clicked

Examples:

```
a: link {color: # FF0000; text-decoration: none;}
a: visited {color: # 00FF00; text-decoration: none;}
a: hover {color: # FF00FF; text-decoration: underline}
a: active {color: # 0000FF; text-decoration: underline}
```

1.12.5 CSS Lists

This property is used to format Lists. The symbol or number or character of the item in the list is referred to as item marker. Examples of Item Marker are circle, square, disc, upper-roman, lower-roman, lower-alpha, upper-alpha.

Example:

```
ul {
list-style-type: circle;
}
```

The List-Style-Image property can be used if the image is to be used as an item marker.

Example:

```
ul {
list-style-image: url ('arrow.gif');
}
```

1.12.6 CSS Border

This property is used to set and format the border around the elements. We can set border's style, width and color for the html elements using this property. These three properties are used to format the border:

Property	Description
border-style	This property is used to set the style of the border. Commonly used values for setting border style are: none, dotted, dashed, solid, double, groove, ridge, inset and outset.
border-width	This property is used to set the width of the border
border-color	This property is used to set the color of the border
border	It is used to set all the border properties in one declaration

Example:

```
p {
border-style: solid;
border-width: 5px;
border-color: blue;
}
```

Following example shows the usage of all border properties in a single declaration. In this example, 5px is the border width, solid is the border style and red is the border color:

```
h1 {
border: 5px solid red;
}
```

The four sides of the Border can also be formatted differently in CSS. For Example:

```
p {
  border-top-style: dotted;
  border-right-style: solid;
  border-bottom-style: dashed;
  border-left-style: dotted;
}
```

1.12.7 CSS Margin

This CSS property is used to set the space around the elements. This space is called margin. Margins have no color but are transparent. They are set on the outside of the border. There are four directions for setting margins: left, top, right, bottom:

Property	Description
Margin	It is used to set all the margin properties in one declaration
Margin-left	It is used to set the margin at the left side of html element
Margin-right	It is used to set the margin at the right side of html element
Margin-top	It is used to set the margin at the top side of html element
Margin-bottom	It is used to set the margin at the bottom side of html element

Example:

```
p {
margin-left: 40px; margin-right: 60px;
margin-bottom: 50px; margin-top: 70px;
}
```

Examples of Margin - Shorthand property:

```
margin: 50px 60px 70px 80px;    (margins for top, right, bottom, and left side)
margin: 50px 60px 70px;         (margin for top, left and right, bottom side)
margin: 50px 60px;              (margin for top and bottom, left and right side)
margin: 50px;                   (margin for all four sides)
```

1.12.8 CSS Padding

This property is used to set the space between the content and the border of the element. There are four directions for setting padding: left, top, right, bottom:

Property	Description
Padding	It is used to set all the padding properties in one declaration
Padding-left	It is used to set the padding at the left side of html element

Padding -right	It is used to set the padding at the right side of html element
Padding -top	It is used to set the padding at the top side of html element
Padding -bottom	It is used to set the padding at the bottom side of html element

Example:

```
p {
padding-top: 25px; padding-bottom: 25px;
padding-right: 50px; padding-left: 50px;
}
```

Examples of Padding- Shorthand property:

```
p{ padding: 50px 60px 70px 80px;}   (Padding for top, right, bottom, and left side)
p {padding: 50px 60px 70px;}        (Padding for top, left and right, bottom side)
p {padding: 50px 60px;}             (Padding for top & bottom, left & right side)
p {padding: 50px;}                  (Padding for all four sides)
```

1.12.9 CSS Box Model

The term box model is used in connection with design and layout of web pages. Each element of an html is a box in a way. The web browser renders every element as a rectangular box according to the CSS box model.Box-Model consists of multiple properties.It includes: margins, borders, padding, and the actual content. The image below illustrates the box model:

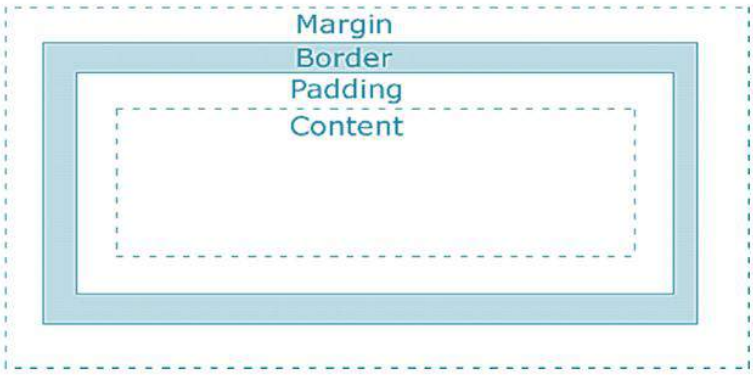


Figure 1.8

These components of box model are explained below:

Property	Description
Content	It is the area where actual contents of the box are displayed. It may be a text or image or any other media.
Padding	This area is actually the space around the content area and within the border box.

Border	It is the area between the box's padding and margin. Its dimensions are given by the width and height properties of the box.
Margin	It is an area outside the border. The margin is transparent.

For designing the layout of the web pages using box model of CSS, two elements and are commonly used in HTML. These elements are explained below:

Both and is used to define parts of a web page. A div is a block-level element and a span is an inline element.The div should be used to wrap sections of a document, while spans are used to wrap small portions of text, images, etc.

Here's an example:

Demo Text, with some other text.

The element is used while creating CSS based layouts in html, whereas element is used to stylize texts.The and elements has no required attributes, but style, class and id are common attributes which are used with these both elements. Following example shows how to define and use box model in web pages:

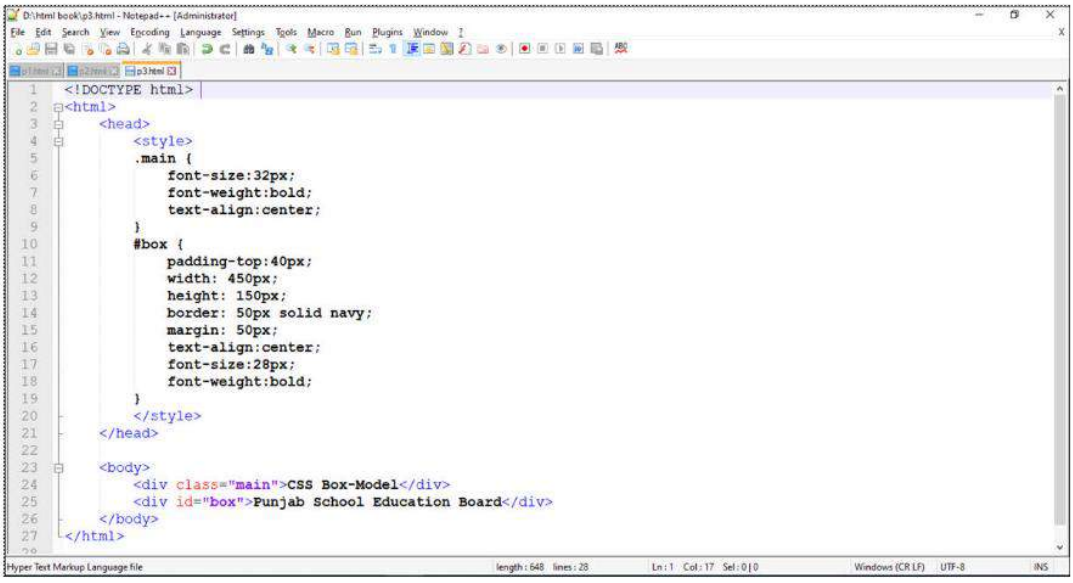


Figure 1.9 Box Model Example Program

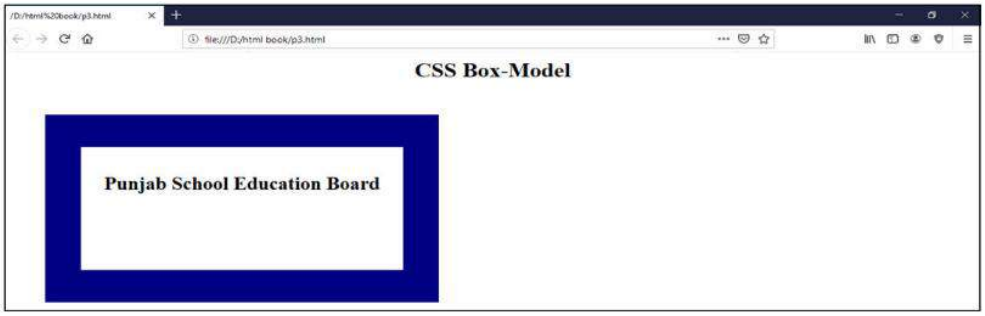


Figure 1.10 Output of Box Model Example Program

1.13 EXAMPLE PROGRAM FOR CSS PROPERTIES

So far now what we have studied will now be shown using a simple program. We are going to create a demo program which shows how to use css properties using internal style sheets. Following program has been created using the Notepad++ Editor which will be open in the chrome browser to view it.

```
<!DOCTYPE html>
    <head>
        <style>
        .main {
        color:navy;
            font-size:32px;
            font-weight:bold;
            text-align:center;
        }
        #box {
            padding-top:10px;
            width: auto;
            height: auto;
            border: 5px solid navy;
            margin: 5px;
        }
        h1{
        background-color:black;
        color:yellow;
        text-align:center;
        }
        a:hover{
        text-decoration:underline;
        color:blue;
        font-size:32px;
        }
        p,s1{
        font-size:16px;
        text-align:justify;
        }
        #s1{
        color:red;
        font-weight:bold;
        }
        </style>
    </head>

    <body>
        <div class="main">Demo Web Page for CSS</div>
        <div id="box">
        <h1>Welcome to Web Designing</h1>
        <p>This is a demo web page which shows how to use various css properites in a web page. We have learnt
        about <span id="s1">background properties, text properties, font properties, margin properties, link
        properties, padding properties, border properites etc.</span> in this chapter. This example shows how to
        use these properties.</p>
        <p>CSS Stands for Cascading Style Sheets. These style sheets are used to format web pages. CSS is a
        language that describes the style of an HTML document. CSS describes how HTML elements should be
        displayed.</p>
        <h3>For more information on css, you may visit <a href="https://www.w3schools.com/css/default.asp">
        w3schools.com</a> by clicking on the link.</h3>
        </div>
    </body>
</html>
```

Figure 1.11 Example Program for using CSS

Figure 1.12 Output of above example program

Points To Remember

1. The design of the website should be simple and uniform.
2. The combination of text, images, video and audio on the webpage should be used in such a way that the loading time of the webpage is not more and the webpage should be of Light Weight.
3. HTML (Hyper Text Markup Language) is the main markup language for web pages.
4. HTML provides a means of generating webpages with HTML text, lists, pictures, videos, audio, tables, frames, headings, forms, and more.
5. The HTML provides us features to include or load scripts written in languages like Java Script.
6. The link in the HTML is called hyperlink and it is used to navigate to another webpage or any type of file by clicking on it. It is created with the <a> (anchor) tag.
7. Using cascading style sheets (CSS) we can make the design of websites and webpages very easy and effective.
8. There are three types of CSS: inline, internal and external.
9. CSS PADDING Properties set the distance between the content and border of the element.
10. CSS BOX MODEL is used in relation to design and layout for web pages. Each element of an html is a box in a way.

EXERCISE

Part-A

1. Fill in the Blanks :

I. For creating Website Clean and fresh _____should be prioritized.

II. It has been learned from a research that ordinary users scan webpages (computer screens) in _____ pattern.

III. HTML is used to organize text, images and other webpage's _____ into webpages.

IV. By using _____the design of websites and webpages can be designed in a very simple and effective way.

V. _____helps to select and set html elements.

2. Very Short Answer Type Questions :

I. Write the full name of W3C.

II. Write the full name of CSS.

III. What is the extension of the external CSS file?

IV. In which tag INTERNAL CSS is defined in the HTML webpage.

V. Write the full name of WYSIWYG.

Part-B

3. Short Answer Type Questions. (Write the answers in 4-5 lines)

I. Write the basic structure of HTML.

II. Write various WEBSITE DEVELOPMENT PHASES.

III. Write the role of HTML in the WEB.

IV. What CSS is used for?

Part-C

4. Long Answer Type Questions. (Write the answers in 10-15 lines)

I. Explain the principles of good web design.

II. How CSS can be used for web design.

III. What are the benefits of CSS?

IV. Explain CSS BOX MODEL.

V. Explain the BORDER property in CSS with coding.

Lab Activity

- Develop a web page having information about your school and format it with the CSS properties mentioned in this chapter.

CHAPTER - 2 USAGE OF INTERNET

OBJECTIVES OF THIS CHAPTER

2.1 Internet
2.2 Internet & its Application
2.3 Internet Search
2.4 Internet and World Wide Web
2.5 Internet Security

INTRODUCTION

Internet is the one of the best technologies gifted to mankind in present scenario. It has brought the entire world at our fingertips. Today the use of Internet has increased tremendously. In this chapter we will learn about Internet & World Wide Web. Also we will discuss about its applications, security, searching techniques and will learn about Google apps.

2.1 INTERNET

The name Internet itself suggests its meaning. It stands for International network of computers. A network is a interconnection between two or more computers.(as already studied in previous classes) The Internet, sometimes simply called "The Net," is a global network connecting millions of computers all over the world. These computers are digitally connected to each other by cable, fibre or wireless links. We can use the internet to browse websites, communicate with people, download pictures and videos, listen to music or do lots of other amazing things.

Fig. 2.1 Internet

When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs. We can get information, access data, shop, play games and many more with just a mouse click.

2.1.1 Internet Service Provider

Internet service provider (ISP) is a company that provides Internet connections and services to individuals and organizations. ISP makes the Internet a possibility. In other words, without

a subscription with an ISP, we won't have a connection to the Internet. For a monthly rent, the service provider usually provides a software package, username, password and access phone number e.g. Airtel, Vodafone, Idea, BSNL, Jio etc.

Early ISPs provided Internet access through dial-up modems. This type of connection took place over regular phone lines and was limited to 56 Kbps.. In the late 1990s, ISPs began offering faster broadband Internet access via DSL and cable modems. Some ISPs now offer high-speed fibre connections, which provide Internet access through fibre optic cables.

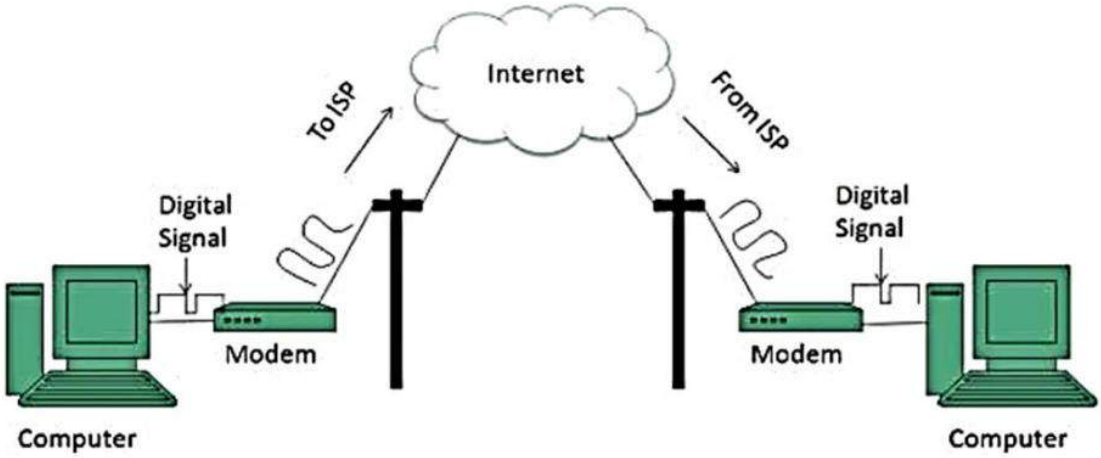


Fig 2.2 Internet Service Provider

ISPs may also be called IAPs(Internet Access Providers).

2.1.2 Web Browsers

A Web Browser or simply Browser is an application software that allows us to view and access websites on the Internet. It allows a user to locate, access and display web pages. User can request for any web page by just entering a URL (Uniform Resource Locator) in the address bar of the browser. A browser can show simple text, audio, video, hyperlinks and animations. The main function of the web browser is to fetch information resources from the web and display them on a user's device (PC, laptop, Mobile etc.). There are a lot of browsers available in the market today. Following is the list of some common web browsers:

- Microsoft Internet Explorer
- Google Chrome
- Apple Safari
- Mozilla Firefox
- Opera

Fig 2.3 Web Browsers

2.1.3 Bookmarks and Favourites

As we know a Bookmark is a thin marker commonly made of card, metal, plastic or cord etc. It is used to keep the reader's place in a book and enable the reader to return to it with ease. But when referring to an Internet Browser, it is a method of saving a web page's address. There is no difference between bookmarks and favorites. They are different words that describe the same thing. Internet Explorer is the only major Web browser that uses the term "favorites." A URL saved for future browsing in Mozilla Firefox, Google Chrome and Apple Safari is called a "bookmark." With millions of websites coming online daily, we will certainly find ones we want to revisit by using Bookmarks. Bookmarks and Favorites save Web addresses so that we can return to them quickly, without having to retype them. Whether we are using Mozilla Firefox, Internet Explorer, Safari, Chrome or another browser, the procedure is similar.

Adding Bookmarks:

- Open the web page where we want to add a bookmark to.
- Find the star on the address bar.
- Click the star. A box will pop up.
- Choose a name for the bookmark. Leaving it blank will only show the icon for the site.
- Choose what folder to keep it in.
- Click Done.

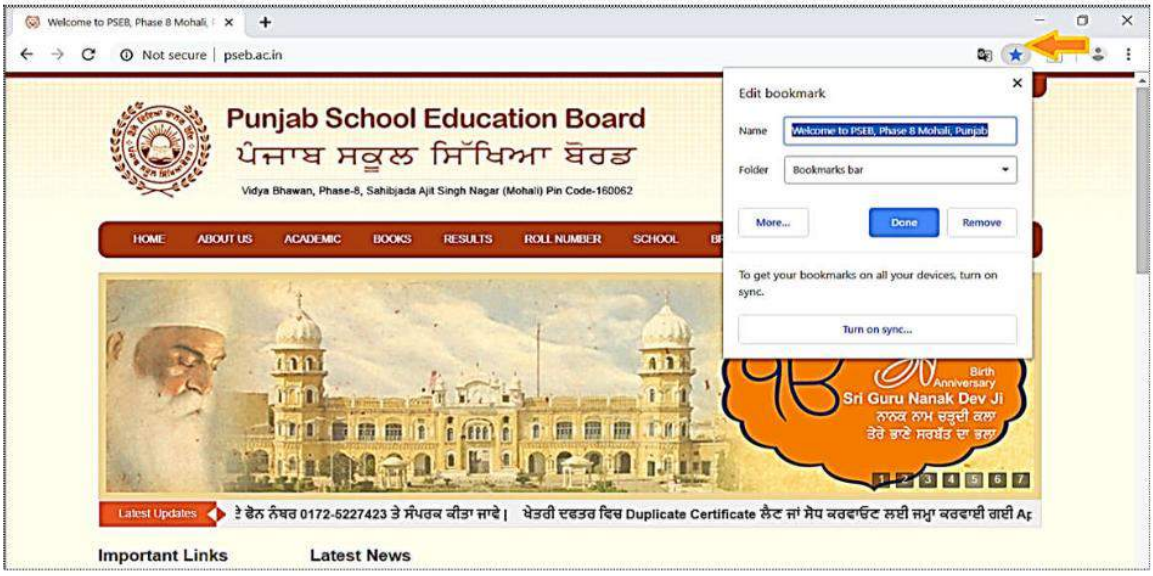


Fig 2.4 Bookmarks and Favorites

2.1.4 Identify Secure Sites (HTTPS, Lock Symbol)

It's unfortunate that not every website is trustworthy and secure. An unsafe website can spread malware, steal information, send spam, and more. There are two simple ways to ensure that we are on a secure website.

1. Look at the web address in web browser, make sure the web address starts with https://

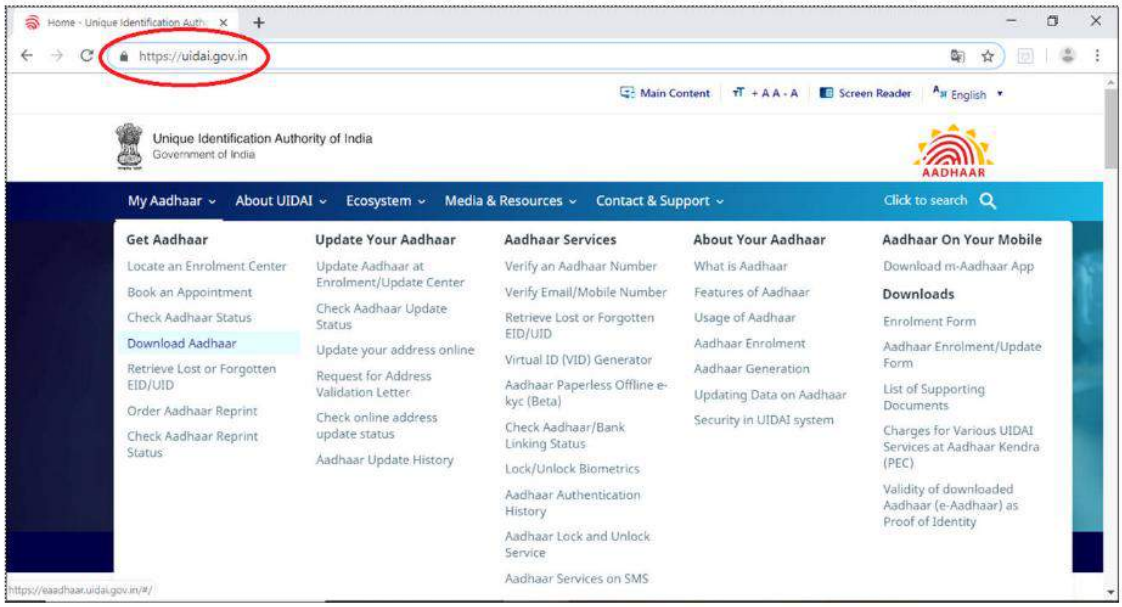


Fig 2.5 Identify Secure Sites

HTTPS stands for Hypertext Transfer Protocol over Secure Socket Layer (SSL). It is the modification of HTTP used to secure the information between browser and server. It provides authentication and security for website information. HTTPS encrypts the information given by user side and decrypt the information from server side.

SSL Certificate provides security for the customer side information.

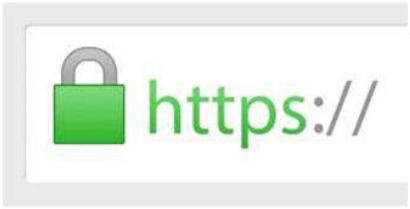


Fig 2.6 Green Padlock

2. Look for a closed padlock in web browser.

Internet data travels from its starting point to its destination through numerous routes and relay points. At every point in the journey, it's possible that somebody could intercept and read the data. A green padlock indicates:

We are definitely connected to the website whose address is shown in the address bar; the connection has not been intercepted.

The connection between the browser and the website is encrypted to prevent spying.

When we click on the padlock we should see a message that states the name of the company and "The connection to the server is encrypted" .

Note : Different web browsers have the padlock in different locations on the screen.

Important to Remember:

- Do not log into a site if it is not secure as described above.
- Do not log into a site if we feel it is a fake.
- Log out of the site when we are finished.

A secure website creates an encrypted connection between our web browser and the site company web server. This encrypted connection prevents criminals on the internet from spying on internet traffic with the purpose of stealing our information.

2.2 INTERNET AND ITS APPLICATIONS

2.2.1 Communication

The world is ever-changing and with the arrival of digital technology, it is changing at a very fast speed. Today Internet communication has made sure to connect people from two opposite sides of the earth with no problem at all.

Internet communication is referred to as sharing of information, ideas, or simply words over the Internet. Unlike before, people can stay at home and be connected to his or her family, friends, and even colleagues from anywhere around the world.

2.2.1.1 What Are the Advantages of Internet Communication?

Communication on the internet has much more advantages than disadvantages.

- **Versatility -** Internet communication is 24X7, as long as we're connected to the web. When doing business, this can definitely help us.
- **Leveling -** Some people are more comfortable talking behind their keyboards than they do in person, thus enabling the reserved ones to produce well drawn out thoughts and not get sacred by "loud" people. This can also give them the sense of satisfaction (saying what they want to say with no one looking at them or giving them the "eye").
- **Well-documented -** Unlike usual face-to-face conversations, communication on the internet is well-documented, thus creating a more responsible environment where people are held answerable for their words.
- **Growing Community -** Like all forms of communication, everyone can be shy at first. However, in the case of internet communication, people are more likely to be supportive and engaged in discussions than the other communication forms.

2.2.1.2 What Are the Types of Internet Communication?

With the advent of high-speed internet connections, the internet has created more ways of instant communication that provide a vast option of information sharing.

- **Social Media Sites -** Almost everyone with access to the web has a social media account. Whether it be Facebook, Twitter, Instagram, or what ever account we have A single post can connect us to a friend or loved one through means of "liking", "sharing", or "commenting".

- **Instant Messaging -** Instant message or IM is sending a real-time message from one user to another. Examples: Yahoo! Messenger, Windows Live Messenger etc.
- **E-mail -** Electronic mail is the new version of the traditional mail. This is more likely to be performed when engaging with a person officially.
- **Forum -** Forums are specifically directed to people who have questions or want to start an idea or thought through group discussions. Each post is classified as a thread and is normally monitored by a mod, or moderator, who can either edit or remove unnecessary posts that are irrelevant to the discussion at hand.
- **Blog-** Consider this as our pre-internet journal or diary. Before, a journal zooms in on one person's life story. Now, a blog is used for more than life-sharing. People do blogs to earn money by promoting products, information-sharing, giving tutorial, and even making political statements. People can comment and subscribe to their blogs if they like the contents.

Fig 2.7 Internet communication

NOTE: When we're communicating on the Internet, we must take special care not to give out personal information to strangers and to treat others with respect. Be aware of the risks involved in communicating with those people that we cannot see and may never meet them personally. Take time to consider what we write to others, and be careful to avoid humour and sarcasm except with the best of friends. We can't assume that our messages are private, so be careful about what we write.

2.2.2 Job Search

The internet is an excellent tool to locate a job. If we're looking for a job, the Internet is a great way to find and apply for advertised jobs and to post our resume where employers can view it.

Fig 2.8 Job Search

Ways to use the Internet for your job search:

- Job search engines: Job search engines search only for jobs, so they can be more effective for work search than general search engines.

For example: monsterindia.com, naukri.com, naukriHub.com, timesjobs.com etc.

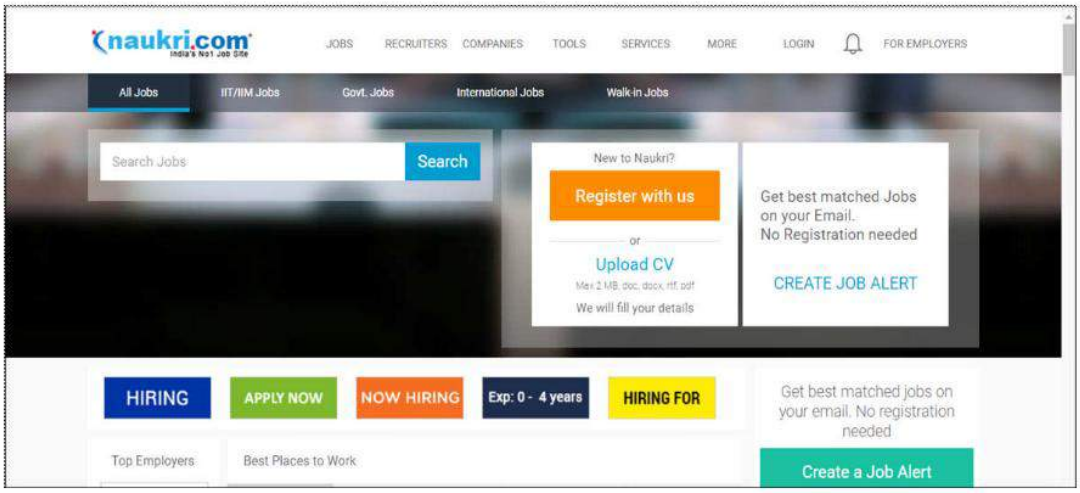


Fig 2.9 Job Search on naukri.com

- **Social Media :** Social Media can allow us to get up close and personal with potential employers. Twitter (twitter.com) gives you the ability to follow companies and recruiters, who may offer information about upcoming job openings. Similarly, Facebook (facebook.com) is filled with corporate pages that include career information. Social media isn't just about receiving information; we can use it to contact potential employers and to actively network in our job search.
- **Visit employer websites to look for jobs and work opportunities :** Many employers prefer to hire directly through their websites, which are often a useful source to easily access information about their organizations.

2.2.2.1 Presenting Your Resume

Our job search isn't just about finding the right job; it's about convincing employers that we are the right person for the job. Don't start job search without giving due thought to our resume because a strong resume does wonders for our chances of making it to the interview stage.

2.2.3 Online Shopping

Online Shopping is the action or activity of buying goods or services over the Internet. In simple words it is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the Internet using a web browser. We can do online shopping from any online store(A website meant for online shopping).An online store is a website through which customers place orders. It may represent a small local store, a major retailer, an e-commerce store or an individual who sells products through a third-party site

Fig 2.10 Online Shopping

2.2.3.1 Some famous online stores are:

- www.amazon.com
- www.flipkart.com
- www.snapdeal.com etc.

2.2.3.2 How to buy a product through online shopping:

1. If there's a particular brand or store we like, we can go straight to their website or we can visit a shopping website such as Amazon or flipkart etc., which carry broad ranges of new and second-hand items.
2. Search for a product: Type the name of the item we want to buy into the search box and click Search or press enter on our keyboard. This will give us items available based on product reviews and price.
3. Add to basket or cart: Once you have chosen the amount and colour click on ADD TO BASKET. Doing this will save the details of this item until we are ready to buy it.
4. Continue shopping or buy your product: We now have two choices either to Continue Shopping if you wanted to buy other items from this website or to click on Go to Cart and pay for the item we have chosen.
5. If we've finished shopping, click Proceed to Checkout.
6. Now sign in as a new customer.
7. Enter delivery address
8. Choose the payment option like by credit card or debit card
9. Fill the payment details(card details)
10. Then click on "place your order".

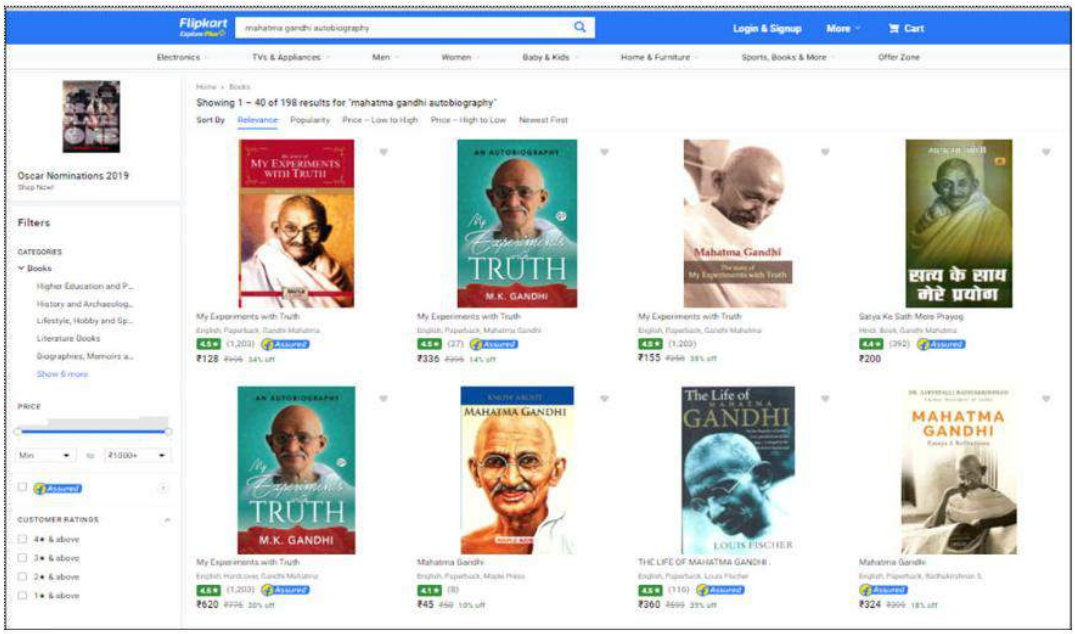


Fig 2.11 Online Shopping of book on Flipcart.com

Because of the numerous advantages and benefits, more and more people these days prefer buying things online over the conventional method of going into stores. But it has some disadvantages also.

2.2.3.4 Advantages and Disadvantages of Shopping Online:

Advantages of Online Shopping	Disadvantages of Online Shopping
Convenience	Negative Environmental Impact of Packaging
Better Prices	Shipping Problems and Delays
More Variety	Risk of Fraud
Easy to Send Gifts	Less Contact With our Community
More Control	Spending Too Much Time Online
Easy Price Comparisons	Returns Can Be Complicated
No Crowds	We Don't Know Exactly What we're Getting

Table 2.1

2.2.4 Travel

Travel is the movement of people between distant geographical locations. Travel can be done by foot, bicycle, train, boat, bus, airplane, ship or other means, with or without luggage.

The technological development has created an impact on all the aspects of human beings. It includes the way how they travel as well. If we go to the internet, we will be able to see hundreds of travel related website. This is a strong example to indicate how technology has changed the travel and tourism industry within the past two decades.

2.2.4.1 How Internet helps in Travelling

Now people can travel to different destinations in the world at the comfort of their home. Technology along with enlarged reality has helped people to capture images and deliver them to the people in need through internet. On the other hand applications such as Google Street View can help people to roam around streets with the help of their computers or mobile phones.

Fig 2.12 Travel

The popularity of smartphones has also helped people to travel without any hassle. In fact, people can simply find anything that they want with the help of their mobile devices while traveling.

The development of technology has also helped people to travel in a cost effective manner. For example, people had to purchase international calling cards when they travelled to a foreign country in the past. Now a variety of instant messaging and VOIP (voice over Internet Protocol) applications are available for them to communicate at a cheaper price tag.

Whenever we go to a new hotel or a restaurant, we would be going through the reviews that it has on Trip Advisor and other review platforms. Then we will be able to get a clear understanding about the service that we would receive at the end of the day.

We can even do ticket booking at home, which can help us to save a considerable amount of time. In fact, all the services that a traveller would need are available online. For example we can book our railway ticket online from the official website of Indian Railway (www.irctc.co.in). In order to book rail tickets online we need to have an IRCTC account.

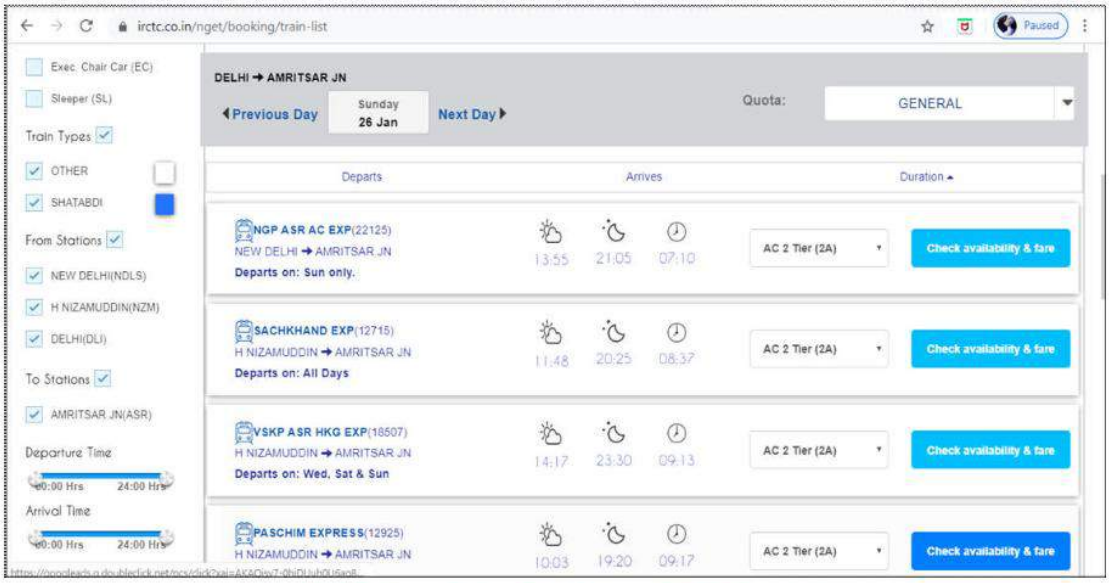


Fig 2.13 Railway Ticket Booking on IRCTC Website

- We can do online train tickets booking by logging into the IRCTC (a subsidiary of the Indian Railways) website directly or by seeking help from licensed IRCTC agents
- After that, we have to select the source and destination stations
- Select preferred train
- Check for train ticket availability
- We have to fill the passenger details (Like: Name/s, age, gender, berth preference and meal preference)
- After completing all the personal details, proceed towards payment
- Fill the details required at the time of payment

- online train ticket booking is finalised once the payment is made
- A message or email will be sent to the passenger's registered details

2.2.4.2 Facility of FASTag in travelling

FASTag is a tag which enables automatic deduction of toll charges and lets us pass through the toll plaza without stopping for the cash transaction. FASTag is linked to a prepaid account from which the applicable toll amount is deducted. The tag employs Radio-frequency Identification (RFID) technology and is affixed on the vehicle's windscreen after the tag account is active.

Fig. 2.14 : Fastag

FASTag is a perfect solution for a hassle free trip on national highways.

What are the benefits of using FASTag?

1. Ease of payment - The toll amount is automatically deducted from fastag prepaid account, So no need to carry cash for the toll transactions, It also saves time.
2. Online Recharge - FASTag can be recharged online through Credit Card / Debit Card / NEFT/ RTGS or Net banking
3. SMS alerts for toll transactions, low balance, etc.
4. Online Portal for customers
5. Validity of 5 Years

2.2.5 Social Networking

Social networking is the use of Internet-based social media sites to stay connected with friends, family, colleagues, customers, or clients. Social networking can have a social purpose, a business purpose, or both, through sites such as Facebook, Twitter, LinkedIn, and Instagram, among others.

Fig. 2.15 : Social Networking

The internet changed the way people interact with each other as well as work culture, and those changes first arose on social media sites. Social media helps people to establish better relationships with their family and friends. That is why people spend a lot of their time online browsing social sites, and usage has only gone up with increase in the use of smartphones and tablets etc.

Some of the popular social networking sites are:

2.2.5.1 Facebook : Facebook is the biggest social media site around, with more than two billion people using it every month. That's almost a third of the world's population! There are more than 65 million businesses using Facebook Pages and more than six million advertisers actively promoting their business on Facebook. It's easy to get started on Facebook because almost all content format works great on Facebook - text, images, videos, live videos, and stories etc.

2.2.5.2 YouTube : YouTube is a video-sharing platform where users watch a billion hour of videos every day. We can create a YouTube channel for our brand where we can upload videos for our subscribers to view, like, comment and share.

Besides being the second biggest social media site, YouTube (owned by Google) is also often known as the second largest search engine after Google.

2.2.5.3 WhatsApp : WhatsApp is a messaging app used by people in over 180 countries. Initially, WhatsApp was only used by people to communicate with their family and friends. Gradually, people started communicating with businesses via WhatsApp.

2.2.5.4 Instagram : Instagram is a photo and video sharing social media app. Instagram (owned by Facebook), was founded by Kevin Systrom and Mike Krieger in October 2010. The company operates independently of Facebook and is headquartered in San Francisco, California. Instagram is an online social networking company that lets you share photos and videos, stories, and live videos with your followers.

Why is Instagram called Instagram?

Instant Camera + Telegram = Instagram

The name Instagram is a combination of the words "instant camera" and "telegram." Systrom wanted its name to be easy to pronounce and spell.

2.2.5.5 Twitter : Twitter is online news and social networking site where people communicate in short messages called tweets. Tweeting is posting short messages for anyone who follows you on Twitter, with the hope that your messages are useful and interesting to someone in your audience.

Fig 2.16 Features of Twitter

2.3 INTERNET SEARCH

On the Internet, searching is just trying to find the information we need. The Internet is a big place, and getting information from it can seem a little discouraging. The Internet contains an unbelievable amount of information, which is really not all that useful unless we can find what we're looking for. Internet searching is one of the easiest and useful ways to use the Internet. There are endless reasons for why Internet searching is so helpful. People use common search engines to find web pages, images, books, currency conversions, definitions, file types, news, local information, movies, and many more.

2.3.1 Search Engines

Searching is one of the most popular activities on the internet. Search engines have become an essential part of everyone's lives. A search engine is a web-based tool that enables users to locate information on the World Wide Web. The engine provides a list of results that best match what the user is trying to find. An Internet search can generate a variety of sources for information. Results from online encyclopaedias, news stories, university studies, discussion boards, and even personal blogs can come up in a basic Internet search. Popular examples of search engines are Google, Yahoo!, and MSN Search. Search engines utilize automated software applications (referred to as robots, bots, or spiders) that travel along the Web, following links from page to page, site to site. The information gathered by the spiders is used to create a searchable index of the Web.

2.3.1.1 Google.com : Google Search Engine is the best search engine in the world and it is also one of most popular products from Google. Almost 70% of the Search Engine market has been acquired by Google. What made Google the most popular and trusted search engine is the quality of its search results. Google is using sophisticated algorithms to present the most accurate results to the users. Google's founders name is Larry Page and Sergey Brin came up with the idea that websites referenced by other websites are more important than others and thus deserve a higher ranking in the search results.

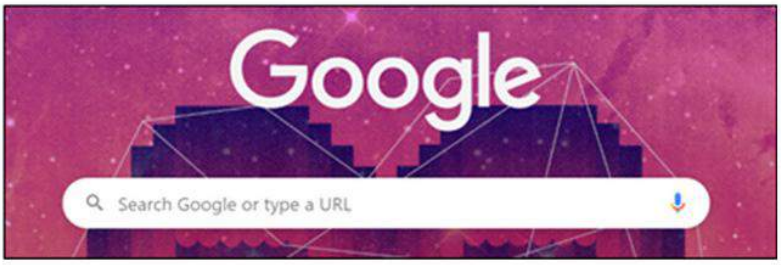


Fig. 2.17 : Google

2.3.1.2 Bing.com : Bing is Microsoft's answer to Google and it was launched in 2009. Bing is the default search engine in Microsoft's web browser. At Bing, they are always striving to make it a better search engine but it's got a long way to go to give Google competition. Bing is Microsoft's attempt to challenge Google in search, but despite their efforts, they still did not manage to convince users that their search engine can be a reliable alternative to Google.

Their search engine market share is constantly below 6%, even though Bing is the default search engine on Windows PCs.

Bing originated from Microsoft's previous search engines (MSN Search, Windows Live Search, Live Search)

Fig. 2.18 : Bing

2.3.1.3 Wikipedia.com : Wikipedia is a free, open content online encyclopaedia created through the collaborative effort of a community of users known as Wikipedians. Anyone registered on the site can create an article for publication; registration is not required to edit articles. The site's name comes from wiki, a server program that enables anyone to edit Web site content through their Web browser. Wikipedia provides us with all the information we need and it also allows us to edit articles if we wish to. Everyone that wants to look for information about something will somehow go on Wikipedia. It is the largest and most popular reference work that is found on the Internet.

Jimmy Wales and Larry Sanger launched Wikipedia on January 15, 2001. At the very beginning, Wikipedia was available only in English but later on was available in 295 languages.

Fig. 2.19 : Wikipedia

2.3.1.4 Encyclopedia.com : As the Internet's premier collection of online encyclopedias, Encyclopedia.com provides us reference entries from credible, published sources like Oxford University Press and Columbia Encyclopedia.

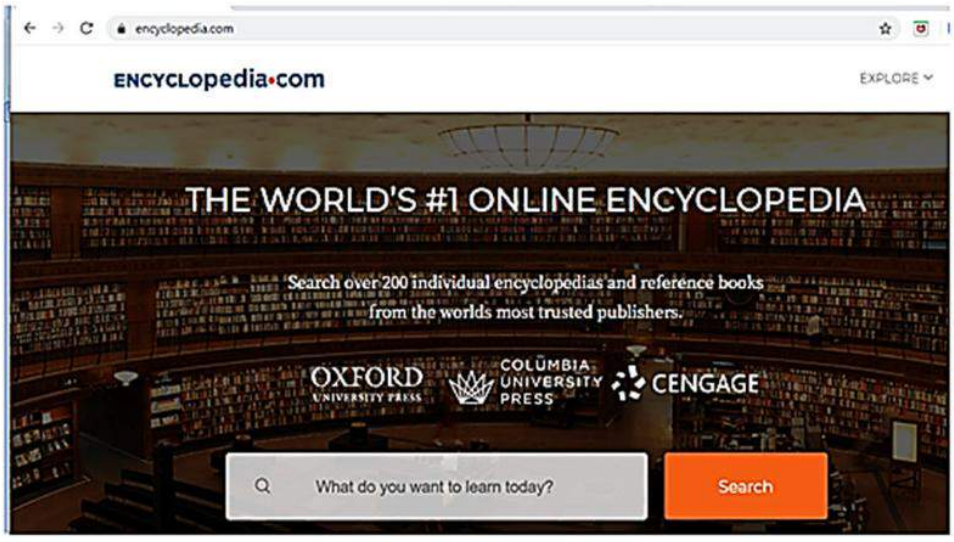


Fig. 2.20 : Encyclopedia

At Encyclopedia.com, we get free access to nearly 200,000 reference entries from sources we can cite. Plus, more than 50,000 topic summaries feature related pictures, videos, topic

summaries, and newspaper and magazine articles from around the world. Encyclopedia.com also provides innovative tools that allow us to rate and sort the reference content that we find to be the most useful.

2.3.2 Search Techniques

Internet is the place to find information about anything that we want or need. But there are billions of websites on the Internet, and to find the specific information we want - quickly and easily is very complicated.

The best way to search the Internet is to take advantage of the power built into search engines (specialized websites such as Google.com, Yahoo.com, Bing.com or ask.com). Just enter words or phrases related to what you want to find, and the search engine will display a list of websites that include that information. Many times, the list shows a brief description of what's on each website, making it easier to decide which site to check out.

We can further narrow our search in several ways:

2.3.2.1 By Using Specific Keywords : Keywords are the terms that you use to find content on the internet. Making keywords as specific as possible will help the search engine to track down the information that we want.

Say, for example, suppose that we want to find a local supplier that can supply bakery items at home. If we type bakery items into our search engine, the results will include many pages about every type of bakery item, whereas typing bakery item supplier will return a more concise range of suppliers.

We can further refine our search by including other specific keywords. If we add our location, for example, we'll likely find someone local.

2.3.2.2 By Simplify Your Search Terms : Some engines include stop words in their searches. These are frequently used words such as prepositions (in, of, on), conjunctions (and, but) and articles (a, the), which mean that we'll end up with more pages in search results than we need.

So, it's usually best to eliminate stop words from internet searches.

Also, use the simplest form of the keywords that we're looking for, by avoiding plurals and verb forms with suffixes such as -ing, -s or -ed. For example, we would improve the quality of our search results by searching for service rather than services, or finance rather than financed or financing.

2.3.2.3 By Using Quotation Marks : Enclosing a search term within quotation marks prompts the search engine to search for that specific word or phrase.

If the term is a single word, using quotation marks will cut out stemmed variations of it. For example, if you search for the word director, you'll likely receive a lot of results for direct, direction, directions, and so on, too. Typing "director" (with quotation marks), however, will ensure that you only get results for that stem word.

Note : Some search engines allow you to search for specific words by preceding them with the + symbol.

2.3.2.4 By Removing Unhelpful Words : Inserting a hyphen/small dash/minus sign immediately before a word excludes it from a search.

So imagine, for example, that we're looking to find out more about marketing. However, we want to concentrate on traditional marketing techniques, whereas the internet appears to be full of references to digital and social media marketing, all of which are appearing in our search.

Typing in marketing -digital will exclude digital from the search, making it easier for us to find the information we're looking for. Typing marketing -digital -social would allow us to get more accurate information.

2.3.2.5 Search Using Operators : Wildcard Searches: use the * symbol as a placeholder for another word. For example, searching for * man in the world returns results for the richest man in the world, the tallest, the oldest, and so on. Wildcard searches are also useful when, for example, we don't know the full text of a quote.

2.3.2.6 Combination Searches : The OR operator enables us to search for two or more terms simultaneously, and is most useful when those terms are very similar. Typing selling OR retailing, for example, will return pages where either of the terms is used, without both needing to be present.

Another way to combine searches is to use AND. This operator ensures that we receive only search results that include two or more terms. For example, the search "Ambujas" AND "Ambanis" would only deliver search results that includes the names of both companies.

2.3.2.7 Search a Specific Site : When we type site: followed by the URL of the website that we wish to search and a search term, we limit our search to a single website. So, site: www.pseb.ac.in "result" will return all the pages from www.pseb.ac.in that feature the term "result"

2.3.2.8 Finding Related Sites : Another useful operator is related: Typing this in front of a web address that we already know - as in related:abc.com- our search results will deliver a range of websites that are similar to abc.com.

2.3.3 Image Search

Search by image is a feature by using we can check similar pictures and photos from the internet. When we search with an image, our results may include:

- Similar images
- The websites that contain these images

We can do an image search on most browsers, like:Chrome, Firefox, and Safari etc.

To search by image, follow the steps given below:

- On your computer, open a web browser, like Chrome or Safari.
- Go to Google Images.
- Click Search by image. 
- Click Upload an image > Choose file or Browse.

- Select a picture from your computer.
- Click Open or Choose.

2.3.4 News Search

We'll find the services to search for the latest news stories from hundreds of sources on the web. These services provide exceptionally good results for current event searching, because they crawl only news sites and revisit these sites several times per day. Thus, the results are usually focused and timely.

- Google News
  http://news.google.com/
- Yahoo News
  http://news.yahoo.com/

2.3.5 Map Search

Online map services can be used to get directions or search a given location. Google Maps is one of the most popular online map services.

To find a location on Google Maps:

Type the address in the search field at the top of the page and click on Search Maps or press Enter or Return on your keyboard.

Fig 2.21 Map Search

2.4 INTERNET AND WORLD WIDE WEB

The Internet is a global network of networks while the Web, also referred formally as World Wide Web (www) is collection of information which is accessed via the Internet. Another way to look at this difference is; the Internet is infrastructure while the Web is service on top of that infrastructure. Alternatively, the Internet can be viewed as a big book-store while the Web can be viewed as collection of books on that store.

The World Wide Web, or simply web, is a way of accessing information over the medium of the internet. It is an information-sharing model that is built on top of the internet. The web uses the HTTP protocol, only one of the languages spoken over the internet, to transmit data. The web also utilizes browsers, such as Internet Explorer or Firefox, to access Web documents called WebPages that are linked to each other via hyperlinks. Web documents also contain graphics, sounds, text and video.

The web is just one of the ways that information can be dispersed over the internet. The internet, not the web, is also used for email, which relies on SMTP, Usenet news groups, instant messaging and FTP. So, the web is just a portion of the Internet, but the two terms are not same.

2.5 INTERNET SECURITY

The internet offers a wealth of opportunities but it also brings its fair share of dangers too. Once you are online, it asks to remain security-aware at all times as there are many threats coming from multiple sources -

- **Hackers :** Hackers are people who attempt to break or avoid online security measures for a number of reasons.
- **Viruses :** Computer viruses are programs which are designed in order to gain entry onto unsuspecting users' computers. Once they have gained a grip within a computer system they will then attempt to duplicate themselves before spreading via email, networks and/or removable storage devices. Typically, their concern is to corrupt or destroy data or otherwise damage the operation of the machine on which they reside.
- **Spyware :** Spyware can prove to be a major annoyance as it's goal is usually to collect personal information and browsing habits in order to deliver targeted advertising to us as we browse the web.
- **Worms :** A worm is a self-replicating program which will attempt to spread itself around your network, either via routers, the internet or by email. Unlike a virus, a worm does not need to attach itself to another program in order to spread.
- **Phishing :** Phishing scams usually arrive via email and are designed to appear to be from legitimate organisations so as to trick the recipient into responding with their personal information.
- **Spamming :** Spam is any form of unsolicited message, it will be on email, private forum message. Spam messages don't usually pose any threat to your security but can be incredibly annoying and distracting.

There are ways to protect from the threats:

- Ensure that you are always running a fully updated anti-virus program
- Make sure that you have a firewall and that it is fully operational
- Choose secure and strong passwords and change them on a regular basis
- Install updates and patches for your operating system as soon as they become available
- Never click on links in emails unless you are 100% certain that they are trustworthy
- Lastly, engage your brain and employ commonsense - it really is the best security measure.

Points To Remember

1. Internet stands for International network of computers.
2. Internet service provider (ISP) is a company that provides Internet connections and services to individuals and organizations.
3. A Web Browser or simply Browser is an application software that allows us to view and access websites on the Internet.

4. A bookmark is a method of saving a web page's address.
5. An unsafe website can spread malware, steal information, send spam, and more.
6. The internet is an excellent tool to locate a job.
7. Online Shopping is the action or activity of buying goods or services over the Internet.
8. Encyclopedia.com provides us reference entries from credible, published sources like Oxford University Press and Columbia Encyclopaedia.
9. Wikipedia is a free, open content online encyclopaedia created through the collaborative effort of a community of users known as Wikipediaes.
10. Computer viruses are programs which are designed in order to gain entry onto unsuspecting users' computers.

Part-A

1. Multiple Choice Questions

I. We can locate a job on

a. Newspaper b. Internet

c. Both (a) and (b) d. None of these

II. The collection of information which is accessed via the Internet.

a. Data b. Information

c. World Wide Web d. Web

III. These searches are useful when we don't know the full text of a quote.

a. Wildcards b. Operators

c. Image d. News

IV. It is a photo and video sharing social media app.

a. Facebook b. Instagram

c. Both (a) and (b) d. None of these

V. It is the most popular product of Google.

a. bing.com b. google.com

c. wikipedia.com d. yahoo.com

2. Fill in the Blanks:

I. _____ allows us to view and access websites on the Internet.

II. Action or activity of buying goods or services over the Internet is known as _____.

III. _____ is a web-based tool that enables users to locate information on the World Wide Web.

IV. Enclosing a search term within _____ prompts the search engine to search for that specific word or phrase.

V. Without a subscription with _____, we won't have a connection to the Internet

3. Very Short Answer Type Questions

I. A company that provides Internet connections and services to individuals and organizations is known as _____?

II. What is the full form of HTTPS?

III. Which tool is used to search only for job?

IV. What is the method of saving a web page's address called?

V. Name any one free, open content online encyclopaedia.

Part-B

4. Short Answer Type Questions. (Write the answers in 4-5 lines)

I. Define Web browser?

II. What is the use of quotation marks in online search?

III. Name any five Internet Security Threats.

IV. Explain Google Search Engine.

V. What is Bookmark?

VI. Define World Wide Web?

Part-C

5. Long Answer Type Questions. (Write the answers in 10-15 lines)

I. Explain any four online search techniques.

II. What are the advantages and disadvantages of online shopping?

III. What is social networking? Explain any two social networking sites.

IV. How can we identify secure sites? Explain padlock symbol also.

V. What is the Facility of FASTag in travelling? What are its benefits?

Lab Activity

- Add Bookmarks of EPUNJABSCHOOL and PSEB websites in your web browser.
- Using email send a file to your friend.
- Search and save Computer related images on the internet using various search techniques mentioned in this chapter.

CYBER THREATS AND SECURITY

CHAPTER - 3

OBJECTIVES OF THIS CHAPTER

INTRODUCTION

In addition to the use of computers in the present time, the Internet has been used in every field. As the technological age is advancing, the use of the Internet is also increasing. There is no area where there is no Internet access.While the use of the Internet has accelerated the functioning of all sectors and is saving time and money, but overuse of it has led to a number of technical risks which in the technical language have led to cyber threats also called attacks. This is a matter of concern and to know about these threats/attacks, it is important to know about the techniques and precautions to be taken to deal with these threats/attacks and to implement these techniques and precautions. Let us read about cyber threats/attacks in this lesson and the techniques and precautions to be taken to prevent them.

3.2 WHAT IS CYBER?

Before learning about cyber threats/attacks and defence techniques, it's important to know what cyber is. However, the word cyber does not have a clear literal meaning and is itself a unique word. The world of internet is usually called cyber. The word cyber is derived from the Greek word 'cybernetic' (i.e., e-touch), which means a self-controlled scientific system of communication. Therefore, the self-controlled system of communication and computer-based technologies in the world of the Internet has also been renamed Cyber, and there are many other names cyber threats (webservers), cyber-attacks (webservers) cyber-space, cyber-crime (web firmware), cyber security (web site shredding) have been linked. We will now learn about cyber threats (webservers) in this lesson.

Fig 3.1

3.3 CYBER THREATS / ATTACKS

As mentioned above, we have expressed concern about the increasing use of the Internet and the cyber threats/attacks it may cause. Now you have to know what these cyber threats/ attacks are. In the world of the Internet, those possibilities and desperate attempts are categorized as cyber threats/attacks which harm online computer networks and computer based systems with the help of the Internet.Due to the changing nature and use of online technologies day to day,cyber threats have taken many forms and cannot be categorized into one category.Next we will read about the different types:-

Fig 3.2

3.3.1 Cyber Threat/Attack Types

As we have read above, online technologies are changing day by day in the Internet or cyber environment, and their changing forms are creating new risks every day as cyber

Fig 3.3

criminals embrace every new technology as their own, non-linear and Internet-based online systems are being targeted by malicious efforts that are leading to cyber threats/attacks. Some of these risks are currently being posed.

3.3.1.1 Stalking : Stalking (shot a locking) Stalking is an English language word that means chase or fall behind. So, in a series of cyber threats/attacks, when a person makes any kind of harassment to another person against his will, with the use of the Internet based application/software, it is called Stalking.Like forcing someone to post unwanted messages or other content via social media, and forcing confidential information of any kind.

3.3.1.2 Piracy : In a series of cyber threats,when person copies software or other computer based material without the permission and wishes of his original owner, he sells his duplicate copy for his own business interests, leaving the real owner in the lurch. This type of cybercrime is called piracy. As of now, piracy of content such as different software, audio and video has become commonplace.

3.3.1.3 Phishing : The word phishing is an English-language word that means trapping. This is a type of online fraud in which any kind of confidential or personal information is solicited by a user from an unknown address via e-mail or some other way, such as a username, password and CREDIT card or debit card number etc. If a person comes in this roundabout and sends such information to the Fisher, then the Fisher may deduct the amount from his account. This type of online threat is called phishing.

3.3.1.4 Hacking : Hacking is also an English-language word that means to cut or bite. When a cyber-criminal uses some kind of technology to steal and misuse someone's person software, personal account, any kind of online ID(s) or website, it is called Hacking.

Fig 3.4

3.3.1.5 Spamming : Spamming is also a word in the English language which means waste or rubbish, whenever an individual or company sends unwanted emails or messages to an unknown person or group of persons and is repeatedly incited to an item and asked to adopt a process, Could be harmed by obtaining its confidential information. This type of action is called spamming. For example, by sending an e-mail or message repeatedly from an unknown company asking them to join the company

3.3.1.6 Email Spoofing : Email spoofing is the creation of e-mail messages with a foreget sender address. In this revolt, many less aware users share some kind of confidential information at such an address and suffer the consequences.

3.3.1.7 Denial of Service Attack /DOS Attack : Denials of Service Attack is a type of online attack that targets a server computer or computer network, and information about its crash is accessed by the user connected to it. These types of attacks are most commonly found in the banking sector, commerce and high level organizations.

3.3.1.8 Web Jacking : Web jacking is also an unauthorized operation, such as high jacking, in which a hacker makes unauthorized alterations to any other web site for his own benefit and changes the information contained on that web site.In the past, web hackers hacked websites of the Ministry of Information Technology and the Bombay Crime Branch.

3.3.1.9 Internet Time-Theft : Internet time theft is an unauthorized online operation in which a user's personal name and password is used by another person to access the Internet without his knowledge of the Internet account. Nowadays these practices have become commonplace due to the convenience of Wi-Fi internet service.

3.3.1.10 Salami Attack : Salami Attack is one of the dangerous online attacks. This is an action that is very difficult to identify. These types of online attacks are most commonly seen in the banking sector. Such online attacks target credit or debit card information of a bank's customers in a manner that a small amount of money goes out of their accounts into the account of the opener, and the customer does not even know about it because in such online attacks those customers' accounts are targeted where the amount is often more and the transactions are frequent.

3.3.1.11 Data Diddling : Diddling means nesting or destroying. In the world of cyber-attacks, data diddling is called a maladaptive process in which a cyber-attacker nullifies or transmits information online or other information being consumed by a cyber-attacker, using its information as input.Results are obtained according to personal interests. This type of cyber action is called data diddling.

3.4 CAUSES OF CYBER THREATS/ATTACKS

With the increasing technology and use of the Internet, the number of cyber-attacks is increasing day by day and new cyber-attacks are occurring on a daily basis. It is also important to know what are the reasons or shortcomings behind it, because before learning how to avoid cyber-attacks one has to find out why and how these cyber-attacks are taking place, then one must take any appropriate measures to prevent them. Now we know the reasons for cyber-attacks.

3.4.1 Easy Access to the Internet

One of the biggest reasons behind the rise of cyber-attacks is the easy access to the internet because nowadays it has become very easy for everyone to use the internet and with the advent of different internet service providers in the market; the internet service pack is much lower.

Rates are obtained at home only which is creating a golden opportunity for cyber criminals Because of the easy access to the Internet, everyone is spending a lot of time on the internet and also sharing various types of personal information on the internet, which empowers cyber attackers to carry out cyber-attacks.

3.4.2 Lack of Technical Information

One of the reasons for the increase in cyber-attacks is the lack of technical knowledge; due to the easy access to the Internet nowadays that people are using,those who have no technical knowledge at all and who openly access such links or web sites without any thought.Where they are asked to enter some confidential information such as credit/debit card numbers and passwords and they get caught up in the cyber attacker's behaviour, due to this they may suffer loss.

3.4.3 Non-Use of Security and Privacy

One of the reasons behind the cyber-attacks is that many Internet users do not use any kind of security or privacy when using the internet, so cyber attackers can easily access their computer or any kind of online accounts. And they are harming them.

3.4.4 Criminal Wisdom or Feeling of Revenge

Cyber-attacks are also on the rise because of the criminal intelligence and revenge of many people in the present day as the current physical attacks of any political or commercial ventures are harming their opponents through cyber-attacks.In addition, criminals are resorting to cyber-attacks to fulfil their financial or business interests because such attacks do not require any physical effort and they can harm their opponent while sitting at home.

3.4.5 Ignorance of IT Crime and Law

The prevalence of cyber-attacks is also increasing as more and more people are exposed to IT. No knowledge of the crime and the laws involved. They do not know what punishment or fine they may face if they commit some kind of cyber-crime. Even with this ignorance many people are joining the world of cyber-crime. IT Laws and Rules has been deployed in various countries - India, Canada, the United States, China and Japan - to curb the growing cyber-attacks or crimes. Laws are made.In India IT Act 2000 has been created which is also called the ITA 2000, which contains several types of articles regarding IT crimes.

3.4.6 Excessive Use of Mobile Technology and Social Media

One of the reasons for the increase in cyber-attacks is the overuse of mobile technology and social media. Mobile phones and social media are now being used worldwide in large numbers, which is likely to increase the number of cyber-attacks.Because mobile phone users can easily access social media using the Internet, which is happening on a widespread level, the app host to access social media on mobile phones. And sometimes the mobile phone user accidentally shares any confidential information or fills the information requested after clicking

on a link, is submitted. Cyber-attack is done by cyber criminals on the base of this information which causes financial or mental harm to a user.

3.5 MALWARE AND ITS VARIANTS

As we have already discussed in this text, cyber-attacks/threats, their types and the reasons for their existence.And we have also learned what kind of harm can result from attacks or threats. Now it is important to know how these attacks/threats exist, what kind of techniques/ programs are used by cyber criminals to generate these attacks/threats and how do these techniques/programs work in a cyber-attack Give rise to danger.

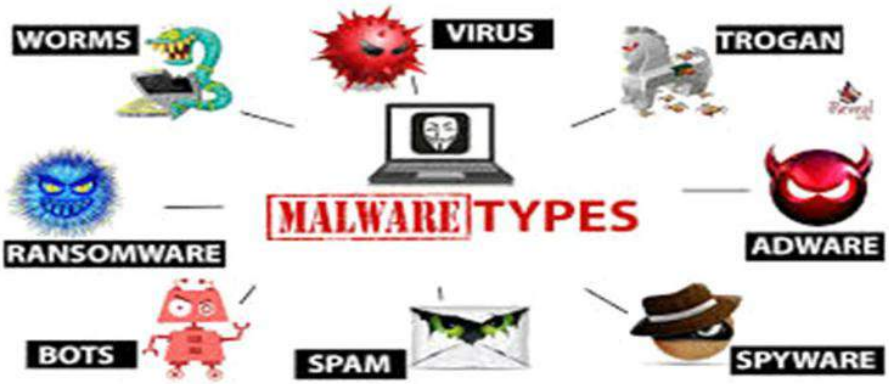


Fig 3.5

3.5.1 Malware

Malware is made up of a combination of two words in English, mal(malicious) and ware (a software), a short form of a combination of a malicious (harmful) and a software. In a computer-based system, a group of malicious programs are called malware.

Which are somehow created by people from the criminal world to harm the computer-based system and adversely affect or destroy the computer-based system.Computer viruses are a common example of malware. Finally, we can say that malware is a malicious computer software.According to the changing and evolving forms of technology nowadays, criminals around the globe are developing a variety of sophisticated software to harm modern computer-based systems that are accessing computers in a variety of different ways. The following are the different names given to these methods based on the way software is operating and damaging computer-based systems.

3.5.1.1 Adware : Adware are malicious programs/software that infects the computer system by means of an add-on that infects the computer.These are entered into the computer when a user clicks on an unwanted add-on while surfing on the Internet.

3.5.1.2 Spyware : Spy is an English word that means 'work secretly'. It is obvious from the literal sense that spyware is also malicious software that gets infiltrated into a computer without permission.And the computer user doesn't even know that his or her confidential information or data is going to an unknown person.This is how software acts like a spy and is called spyware.

3.5.1.3 Viruses : As we all know that the meaning of virus is bacteria as well as we also know that if any type of virus enters the human body then infection in the body can spread which can be serious.Like That the computer virus also completely ruins the computer's operating system.These are those softwares which get attached to the software and ruin computer data and also the working and even some time they are so dangerous as they destroy computer's operating system.

3.5.1.4 Ransom ware : The word ransom in English means 'shrifty'. It literally means ransom ware which means malicious programs /software that log into the computer and lock the entire computer system or any necessary document.

The criminals who deliver such software to someone's computer ask for money in exchange for unlocking the computer and hence such malicious software is called ransomware.

3.5.1.5 Computer Worms : Worms mean "worm". Based on this literal meaning, computer worms are a type of computer virus that are more serious than computer viruses.They act like a slow poison and they slowly erupt into the computer system, and the computer user is unaware that a program has been accessed on his computer. It is then that he realizes that his computer is corrupted immediately.

3.5.1.6 Trojan Horse : Trojan Horse is an application malware and is a type of computer virus.Which enters the computer via a network via a fake e-mail or add-on, and it initially behaves in a friendly way with the computer user.And then the control of the computer is removed from the actual user and handed over to his owner. These types of malware are sent to other people's computers via a network by committing cyber criminals to corrupt, damages or steal any kind of confidential data.

3.5.1.7 Browser Hacking / Hi-Jacking Software : Browser hacking or hijacking software are malware that hack or hi-jack a user's web browser and change their browser settings without their consent and allow them to automatically open the web sites which they do not like to open.

3.5.1.8 Stealware : Steal is an English-language word meaning 'theft'.According to this literal meaning, stealware is malware that is created to steal or divert information about any kind of security information.This malware usually affects the exchange of money in the banking sector such as sending money to a well-known person's account. And malware, called stealware, turns its back on the account of a cyber-criminal who has developed this steelware, and it doesn't happen too often.After learning about the malware above, we have learned that cyber criminals have created and used a variety of malicious software to fulfil their personal interests that affect computer based systems in various ways.We also have to learn to avoid these side effects. Now let's read about cyber-attacks and ways to protect against the malicious software used in these attacks.

3.6 CYBER SECURITY AND TECHNIQUES

As we have read above and know that there is a proliferation (increase) of cyber-attacks in the world of the internet today, and these attacks are matters of grave concern. There is also a

need to take some action to prevent these attacks, and some software and technology that can help protect our entire computer system from cyber-attacks. Now let's read about cyber security and techniques and know how to prevent cyber-attacks.

Fig 3.6

3.6.1 What is Cyber-Security and Technology?

There are various attempts to prevent cyber-attacks and various techniques or software are used to do so.The various technologies used to prevent cyber-attacks are collectively called cyber security. Cyber security comes with all kinds of efforts to prevent computer-based systems from nesting, data theft and other types of cyber threats. As such, it is clear that all technologies used in computer-based systems to protect the computer-based system from cyber-attacks are cyber security. Now before you know what techniques are used in computer based systems to prevent cyber-attacks? It is important to know what a cyber-security technology is and what its role is in computer based systems.

Fig 3.7

Cyber security techniques are computer software/programs or special instructions that are installed on a computer as a security guard of a computer system and applied to a computer system to prevent any cyber-attack or any other attack. To avoid being deceived not only a single technique is used but there are many different techniques available today. Now let's read about some different types of computer techniques.

Fig 3.8

3.6.1.1 Authentication : Authentication is a security technique in which computer users have full authority over who is allowed to use their computer system or their Networks and who is such a sophisticated protection technique is implemented in a computer based system, Then only those individuals who have been granted authentication by the host/owner can access the computer system or Network and the person who has no authentication cannot access that computer system or Networks.

3.6.1.2 Strong Password : A simple and straightforward technique to prevent any kind of abuse under a computer-based system is to use a strong password for all kinds of IDs and user names, as the password will be as complicated and hard to hack as a hacker or cyber-criminal to break or hack it.

As far as any ID's password should be a combination of alphabets, digits and special symbols. The password for any type of ID should not be private name, date of birth or mobile number. Hackers or cyber criminals can easily steal and misuse such simple passwords. Examples of hard passwords can be as follows: axzy@9356

3.6.1.3 Encryption : This is a security technique that can be used if any computer-based system has a user name or ID's password is invoked so whenever such data or password is entered anywhere using a computer-based system, this security technology will turn it into an unrecognizable special symbol (*******).Which only the filling person or the real user can understand, and even if the unknown person is sitting near, he has no idea what he wrote. Such techniques are typically e-mail ID, password or banking ID. Passwords are applied so that no unknown person can misuse them.

3.6.1.4 Antivirus : Antivirus is a software that protects our computer against any kind of virus. It is also called anti-malware because any virus is a malware against which it works and does not allow the virus to come into the computer even if it comes by scanning the computer with the help of this antivirus, we can eliminate it.

These types of software have no other function in the computer system but they simply protect the computer from the virus.Currently there are various types of antivirus software available such as AVG, Avira, Macfee, Kaspersky, Ad-Aware, Norton etc.

3.6.1.5 Firewall : A firewall is a security used in computer-based systems that protects computers and computer networks from viruses or any other type of cyber-attack. It protects our computer from all kinds of malware by being a strong wall, and doesn't allow any unauthorized person to access our computer or Network.This is a security technique when we use the Internet to block traffic or malware from accessing our computer and prevent it from entering our computer. Currently, two types of firewall are used in computer based systems which are known as hardware firewall and software firewall. At present, a hardware firewall is already embedded in any network device used for networking, which protects all the computers connected to that network against viruses or any other type of malware. Software firewalls now include pre-existing operating systems such as Windows 7,8,10 Vista and Windows XP, which protect our computer.

3.6.1.6 Digital Signatures : Now a days time has come to be known as Digital Era because most of the work has gone online and even signatures have become digital.This is a security technique used to authenticate a user to a computer-based system with a digital code and to transmit or verify of the data and any other online documents.This digital signature security technology is used mostly in the banking sector and other financial transactions.The DDO now submits and verifies employees' pay bills online via digital signatures.It is a very innovative and important security technology that protects computer systems in financial operations.

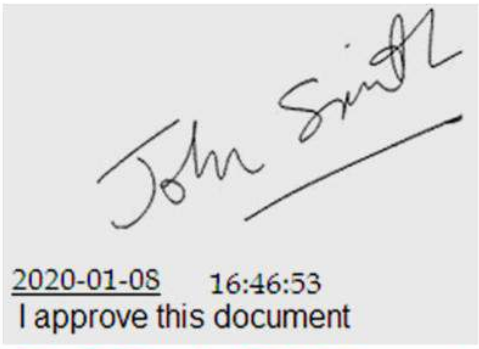


Fig 3.9 (Example of Digital Signature)

3.7 CYBERSPACE AND WWW?

Where there is talk of cyber-attacks/threats or cyber-security, it is important to talk about cyberspace as there are many kinds of doubts in the minds of people about cyberspace.Someone thinks that the Internet is cyberspace and someone gives (The World Wide Web/WWW) the name of cyberspace.To some extent these concerns are also true because if viewed, the Internet, the World Wide Web, and cyberspace are both related to the global network and are also fully related to each other.Only people are confused about their existence.To overcome this apprehension, let's now understand what cyberspace is and how it differs from the World Wide Web.

3.7.1 Cyberspace

There is no physical object in the world of cyberspace internet, nor can it be defined as a physical object.Cyberspace is the Emotional or Virtual electronic environment in the world of Internet in which all Internet users interact to each other. It is an electronic space with no physical location in which all Internet Related activities are performed. Now we also know how it is different from The World Wide Web/WWW.

Fig 3.10

3.7.2 WWW

The World Wide Web is also an important term in the Internet world. It is also called the lonely web in the common language.As its name implies, it is a worldwide phenomenon and is a term different from cyberspace. Although the World Wide Web is also an electronic term, it can also be defined as a physical term,because anywhere in the world of the Internet the World Wide Web is a place or information system connected to the Internet where all the links of html documents (webpages) and URLs (Uniform Resource Locator) that means Web Addresses of all web servers connected to the internet are stored

It is only through the (World Wide Web) that an electronic environment is created called cyberspace, and within this environment, users connected to the Internet interact.

Fig 3.11

3.8 INFORMATION TECHNOLOGY ACT 2000 OR ITA 2000

In view of the increasing technology and Internet usage in India and the cyber threats posed by this use.In order to bring the use of information technology to the forefront of legal and logical congruence with the use of information technology, the Central Government of India passed an Act on October 17, 2000, which was named as IT (Information Technology) Act 2000. This Act is also known as ITA 2000. It is an Act related to cybercrime and electronic

commerce.Later in October 2008, the Act was amended to give the entire control of information technology (IT) in India to the firm CERT-IN(Indian Computer Emergency Response Team). This modification is a complete IT Act 2008 has come to be known.But this Act 2008 is an improved version of IT as it is based on IT Act 2000 is the same. The above IT act made by Government of India, contains certain provisions of the Information Technology and there are certain objectives of the establishment of this Act. Now let's get to the information about those goals and characteristics.

Fig 3.12

3.8.1 Objectives of the IT Act

1. Legalizing electronic information and data communications.
2. Facilitate the storage of data or information online.
3. Recognize digital signatures for authentication of a document or other information.
4. To establish a legal framework for cyber-crime prevention.
5. Recognizing the Electronic Funds Transfer Policy at Banks.
6. Facilitate submission of forms electronically to government departments or agencies.
7. Implementation of Electronic Commerce Across India
8. Promoting the Electronic Business in India.

3.8.2 Features of the IT Act

1. Digital Signatures are legally recognized in the Act.
2. It gives full approval and recognition to all types of financial transactions made through secure electronic media.
3. This IT Act is fully concerned with cybercrime and electronic commerce.
4. The Act establishes a Cyber Appeal Regulation Tribunal that deals with cyber-appeal.
5. The Act provides for legal recognition of government offices and agencies filling and submitting forms online.
6. According to this Act, a hearing against the order of the Cyber Appeal Regulation Tribunal can only take place in the Supreme Court.

7. The Act also applies to offenses committed outside India that are related to India in some way.
8. The Act also legalizes online records and storage.
9. The act recognizes electronic communications.
10. It recognizes the electronic funds transfer technology in the banking sector.

Points To Remember

1. The Internet-based or computer-based automated control Communication system is called Cyber.
2. Cyber-attacks/threats are called malicious attempts by unauthorized individuals to harm computer-based systems via the Internet.
3. Stalking, Piracy, Phishing, Hacking, Spamming, Email-spoofing, Denial of service attack/ DOS attack,Web Jacking, Internet time theft, Salami Attack ,Data Diddling are types of cyber attacks
4. The most common cause of cyber-attacks or threats is the lack of technical information available to the public.
5. Malware is often referred to as a malicious software or program that damages computer-based systems.
6. Adware, computer viruses, spyware, ransom ware, stealware, computer worms, Trojan-Horse, browser hacking, etc. are all malwares.
7. A set of software or Instructions used to protect against cyber-attacks or threats is called cyber security and technology.
8. Firewall, Strong-password, authentication, antivirus, encryption, and digital signature techniques can be used for cyber security.
9. Cyber space is an electronic environment in the world of internet.
10. The World Wide Web is a comprehensive information system where all the URLs/Web Addresses and Html documents(Webpages) are stored.
11. IT Act 2000(NTA 2000) was passed by the Government of India on October 17, 2000.
12. IT Act 2008 (NTA 2008) a new IT Act is implemented through making the Amendments in IT Act 2000.

EXERCISE

Part-A

1. Multiple Choice Questions:

I. Cyber word is taken among which of these?

a. Cybercrime
b. Cybernetic
c. Cyber-attack
d. Cyber security

II. Copying and selling of software or any computer-based material is known as:

a. Phishing b. Stalking

c. Piracy d. Hacking

III. A malware which acts like a spy in computer system:

a. Spyware b. Computer virus

c. Adware d. Ransom ware

IV. Which type of security technique which converts password to special signs?

a. Strong password b. Firewall

c. Digital signature d. Encryption

V. IT act 2000 is known by which another name?

a. IT act 2008 b. ITA 2000

c. Information act d. Income tax act

VI. An electronic environment in which internet users communicate with each other:

a. World Wide Web b. Internet

c. Cyber space d. Cyber cafe

2. Fill in the Blanks:

I. _____ corrupt the computer system.

II. _____ is a digital code which is used to Transmit or verify documents online.

III. Antivirus software keeps our computer safe from _____

IV. _____ acts as secure wall in the computer system.

V. Any unauthorized person alters the website with the use of _____

VI. URL's of severs connected with internet are stored at _____

3. Very Short Answer Type Questions

I. When first IT act comes into?

II. Name any two antiviruses?

III. Write full form of CERT-IN.

IV. Write the complete form of ITA 2000.

Part-B

4. Short Answer Type Questions. (Write the answers in 4-5 lines)

I. What is piracy? Define it?

II. What do you know about web jacking?

III. What are Salami attacks?

IV. Give a brief description about antivirus software?

V. Differentiate between cyber space and WWW(World Wide Web)?

VI. Tell four Objectives of IT Act 2000?

Part-C

5. Long Answer Type Questions. (Write the answers in 10-15 lines)

I. What are the Cyber Attacks? Describe five types of Cyber Attacks?

II. Describe the Causes of Cyber Attacks in Detail?

III. What is Malware? Describe five types of Malwares?

IV. What is Cyber Security?Describe five types of Cyber Security Techniques?

V. What is IT Act 2000?Describe its Features?

COMPUTER SYSTEM MAINTENANCE

CHAPTER - 4

OBJECTIVES OF THIS CHAPTER

4.1 INTRODUCTION

We all know that a computer system consists of Hardware and Software. Both Hardware and Software are required for a computer system to get our task done. So, to keep our computer system always in a running condition, we need to take care of it. Computer maintenance is a practice of keeping computers in a good state of repair.

4.2 COMPUTER SYSTEM MAINTENANCE AND SECURITY

Computer hardware maintenance involves taking care of the computer system components, such as its keyboard, hard drive and internal CD or DVD drives. Cleaning the computer, keeping its fans free from dust, and defragmenting its hard drives regularly are all parts of a computer hardware maintenance program.

Whereas **software maintenance** is a process by which a computer program is altered or updated after it has been released.

Security and Maintenance is a component of the Windows NT family of operating systems. These components monitor the security and maintenance status of the computer system. Monitoring criteria of these components includes optimal operation of antivirus software, personal firewall, as well as the working status of Backup and Restore, Network Access Protection (NAP), User Account Control (UAC), Windows Error Reporting (WER), and Windows Update. It notifies the user of any problem with the monitored criteria, such as when an antivirus program is not up-to-date or is offline.

4.3 PREVENTIVE MAINTENANCE

Preventive Maintenance is the process of inspecting hardware on a regular basis to ensure it stays in good running order. If we are taking good care of our PC, it won't crash and thus protects our data from lose.We should follow the preventive maintenance to stop PC problems.

If our PC resides in a relatively clean, climate-controlled environment, an annual cleaning should be sufficient. But in most real-world locations, such as dusty offices or shop floors, our system may need a cleaning every few months.

4.3.1 Basic Guidelines for Preventive Maintenance

Below is a list of some preventive maintenance guidelines that weshould follow for our computer or computer hardware to keep it running smoothly.

- Always turn off and unplug the system before we clean any of its components. Never apply any liquid(like water or cleaner) directly to a component. Spray or pour the liquid on a lint-free cloth, and wipe the PC with the cloth.
- **Clean the case :** Wipe the case and clear its ventilation ports of any obstructions. Compressed air of Vacuum cleaner is great for this, but don't blow dust into the PC or its optical drives using air-blower, while doing so the dust particles will be blocked in important parts of motherboard. Keep all cables firmly attached to their connectors on the case.
- **Maintain mouse :** Mouse is an important device. The optical mouse also gets dirty as the non-optical mouse (older one)gets. The pointer moves erratically. Clean the dirt down from the surface of the mouse. Always use Mouse Pad to keep clean the mouse from surface. Don't press left, right and scroll button with pressure.
- **Maintain keyboard :** Usually we don't keep our keyboard covered with cover after use, so the dust and particles get inside and over the keyboard. To clean keyboard keep it upside down and shake it to clear the crumbs from between the keys. If your keys of the keyboard easily removed from keyboard then remove it gently and then clean it precisely and fix the removed keys at relevant places. Cover the keyboard after use.
- **Maintain monitor :** Wipe the monitor case and if you are using CRT monitor, clear its vents of obstructions, without pushing dust into the unit. Clean the screen with a

standard glass cleaner and a lint-free cloth. If your monitor has a degauss button (look for a small magnet icon), push it to clear magnetic interference. Many LCDs can be cleaned with isopropyl alcohol. Wipe your LCD lightly: The underlying glass is fragile.

- **Maintain power supply :** The Computer can't run without Power supply. The Power cable must be of good quality. We must check its both ends periodically. We must use these cables for intended purpose. These cables must be installed properly, means the connections must not be loose. The must not be an obstruction in the way of these cables and if possible, these cables must be fixed with clips.
- **Maintain your CD and DVD media :** If you are unable to access media from your CD/DVD then there could be dust on it. So, gently wipe each disc with a moistened, soft cloth. Use a motion that starts at the centre of the disc and then moves outward toward the edge. Never wipe a disc in a circular motion.
- **Maintain your Printers :** Printers are more mechanical than other peripherals and therefore require more attention. Because they use paper, ink, or carbon, printers generate pollutants that can build up and cause problems. Always check the manufacturer's recommendations for cleaning.

4.4 BOOTING AND SAFE MODE PROBLEMS

When we press the power button of computer system, the O.S. (Operating System) start loading, this process is known as booting. Moreover, it can be initiated by hardware such as a button press, or by a software command. After it is switched on, a CPU has no software in its main memory, so some process must load software into memory before it can be executed. This may be done by hardware or firmware in the CPU. Ifour Windows computer is not booting up,it might be because of a hardware, software, or firmware error.

If Window isn't starting properly, we can often use the integrated "start-up repair" tool to fix it. This recovery tool will scan our PC for problems like missing or damaged system files. It can't fix hardware issues or Windows installation problems, but it's a great first place to start if we are experiencing trouble booting into Windows.

This tool is available on Windows 7, 8, and 10. We can access it from the built-in Windows recovery tools, recovery media, or a Windows installation disc.

For many other types of PC problems, we can also use Safe Mode tool of windows. Safemode is a diagnostic mode of a computer operating system (OS).

When Windows starts normally, it launches start-up programs, fires up all the services configured to start, and loads the hardware drivers we have installed. In Windows, safe mode only allows essential system programs and services to start up at boot. Safe Mode starts our PC with a minimal set of drivers. Windows uses a very low screen resolution with generic video drivers and doesn't initialize much hardware support in Safe Mode.

Safe mode is intended to help fix most, if not all problems within an operating system.Safe Mode is a great way to remove problem-causing software - like malware or has unstable hardware drivers that cause blue screens. It also provides an environment where we may find it easier to roll back drivers, and use certain troubleshooting tools.

4.4.1 How to Start Windows in Safe Mode

Our Windows PC should automatically start up in Safe Mode if it crashes more than once while trying to start normally. However, we can also boot into Safe Mode manually:

- **Windows 7 and earlier :** Press the F8 key while the computer is booting (after the initial BIOS screen, but before the Windows loading screen), and then select Safe Mode in the menu that appears.
- **Windows 8:** Hold Shift while clicking Restart on the Power menu on the login screen to begin the process.
- **Windows 10 :** Hold Shift while clicking Restart on the "Power Options" submenu of the Start Menu. Click Troubleshoot > Advanced Options > Startup Settings > Restart. Press the "4" key when we see the Startup Settings screen.

4.4.2 How to Fix Your PC in Safe Mode

After starting Windows in Safe Mode, we can perform most of the regular system maintenance and troubleshooting tasks to fix our computer:

- **Scan for Malware :** Use our antivirus application to scan for malware and remove it in Safe Mode. Malware that may be impossible to remove in normal mode-because it's running in the background and interfering with the antivirus-may be removable in Safe Mode. If we are using Windows Defender in Windows 10, we might be better off performing an offline malware scan.
- **Run System Restore :** If our computer was recently working fine but it's now unstable, we can use System Restore to restore its system state to the earlier, known-good configuration.
- **Uninstall Recently Installed Software :** If we recently installed software (such as a hardware driver or a program that includes a driver) and it's causing our computer to blue-screen, we can uninstall that software from the Control Panel. Our computer should hopefully start normally after we have uninstalled the interfering software.
- **Update Hardware Drivers :** If your hardware drivers are causing system instability, we may want to download and install updated drivers from our manufacturer's website and install them in Safe Mode. If our computer is unstable, we'll have to do this from Safe Mode-the hardware drivers will be installed and won't make our computer unstable in Safe Mode.
- **To check system crashes :** If our computer is unstable normally but works fine in Safe Mode, it's likely that there's a software problem causing our computer to crash.

However, if the computer continues to crash in Safe Mode, this is often a sign that there's a hardware problem with our computer. (Note that stability in Safe Mode doesn't necessarily mean it's a hardware problem. For example, your graphics card may be faulty and causing crashes under load. However, it may be stable in Safe Mode because your computer isn't performing demanding operations with it.)

4.5 INSTALLATION OF DEVICE DRIVERS

A driver is software that a device uses to work with our PC. When our device isn't working properly, we can check if the driver is installed correctly or not. Faulty driver could always be the cause of problem in our PC. To fix the problem, we need to update the driver. For some devices, Windows can update the driver automatically. For some devices especially external devices, we need to install the updated drivers our self, then we need to download the driver manually.

4.5.1 Download the drivers manually

To download new drivers, we need to visit to PC manufacturer's website or device manufacturer's website. Driver updates are often available in the Support section of their website. If we are using a branded computer, it is recommended that we go to the PC manufacturer's website to check for the latest driver first, as they may customize the driver. We are required to use the PC model and the operating system that you are using(like win-7/8/10 etc) to download the correct driver (Operating System is selected automatically on some manufacturer's website). Usually, the PC model can be found on the machine. If we need to download the driver from device manufacturer, then we are required to know the device model.

4.5.2 How to install the driver

When we download a driver file then the downloaded driver file will be an executable file (File name ends in ".exe".) or a zip file (File name ends in ".zip".).

- **For executable file,** to install the driver, we just need to double-click on the file and follow the on-screen instructions.
- **For zip file,** we need to unzip it and find the executable file in the archive. If we cannot find an executable file, we need to install the driver step by step using the ".inf" file. Following steps should be followed to install the driver in this way.

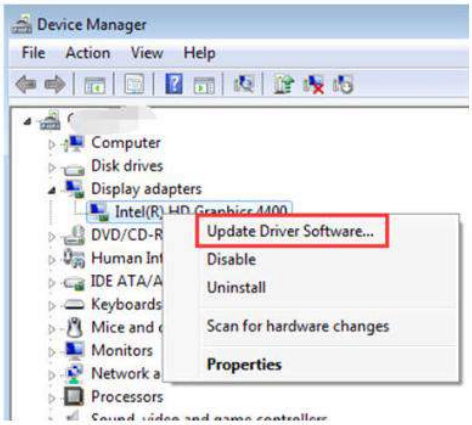
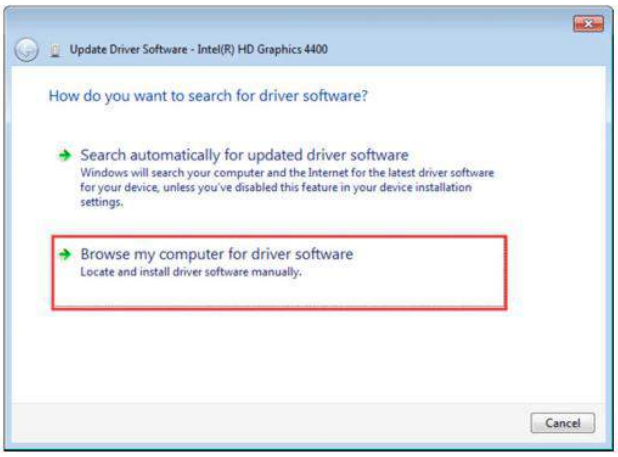


Fig 4.1 Device Manager

1. Open the **Device Manager** by Right Clicking on Start Button in Windows 10.
2. Find the device that need to install a driver. (Here let's take video card for example.)
3. Right-click on the device and select **Update Driver Software…**

4. Select **"Browse my computer for driver software"** as shown in Fig. 4.2.

Fig: 4.2



5. Select **"Let me pick from a list of device drivers on my computer"** as shown in Fig. 4.3.

Fig: 4.3

6. Click Have Disk… button as shown in Fig. 4.4.

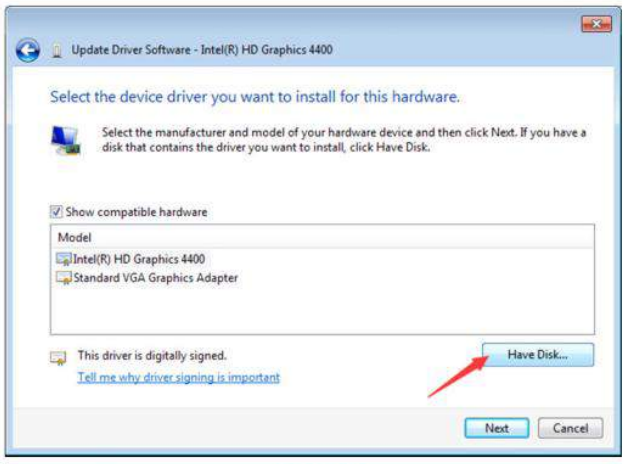


Fig: 4.4

7. Click Browse… button as shown in Fig. 4.5. Navigate to the folder where we saved the downloaded driver file and browse the .inf driver file.

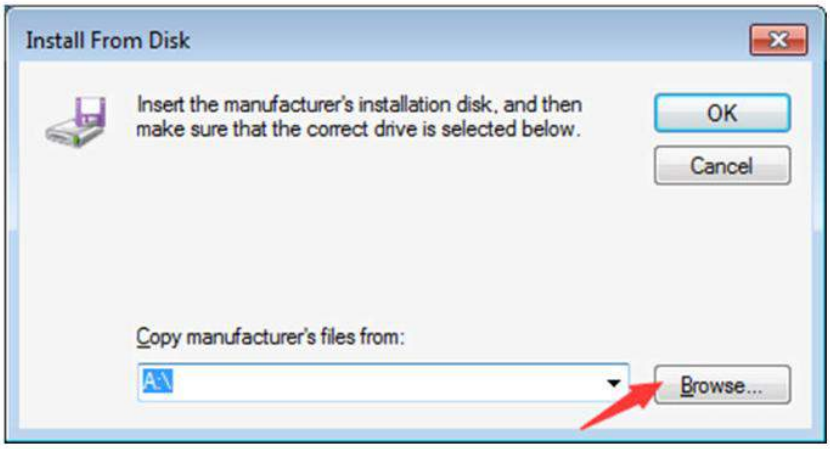


Fig: 4.5

8. Click OK button then Next button to finish the installation. We might be asked for an admin password or to confirm our choice.

4.6 PLUG AND PLAY HARDWARE INSTALLATION

Plug and Play is sometimes abbreviated as PnP. It is a term used to describe that the devices will start work with a computer system as soon as they are connected. So the user does not have to manually install drivers for the device. Instead the computer automatically recognizes the device it loads new drivers for the hardware if needed and begins to work with the newly connected device.

For example, if we connect a Plug-and-Play Keyboard to the USB port on our computer, it will begin to work within a few seconds of being plugged in. If our computer doesn't support plug-and-play device feature then we would require going through several steps of installing drivers and setting up the device before it would work as explained in the previous topic. The basic thing to keep in mind is that the internal components usually require the computer to be turned off when they are installed, while external devices can typically be installed while the computer is running.

4.7 TYPES OF PORTS

In computer hardware, a port acts as an interface between the computer and other computers or peripheral devices. Computer ports have many uses such as to connect a monitor, webcam, speakers, or other peripheral devices. So, a port is a physical docking point using which an external device can be connected to the computer. Let us now discuss a few important types of ports:

- **Serial Port :** This port is mainly used for external modems and older computer mouse. It has two versions: 9 pins and 25 pins. The data travels at 115 kilobits per second using this port.

- **Parallel Port :** This port is used for scanners and printers and it is also called printer port. It has 25 pins.
- **PS/2 Port :** This port is used for old type of computer keyboard and mouse. It is also called mouse port. Most of the old computers provide two PS/2 ports: one for mouse and other for keyboard. Mouse port comes in green color code and keyboard port comes in Magenta color. Color codes are used for quick identification.

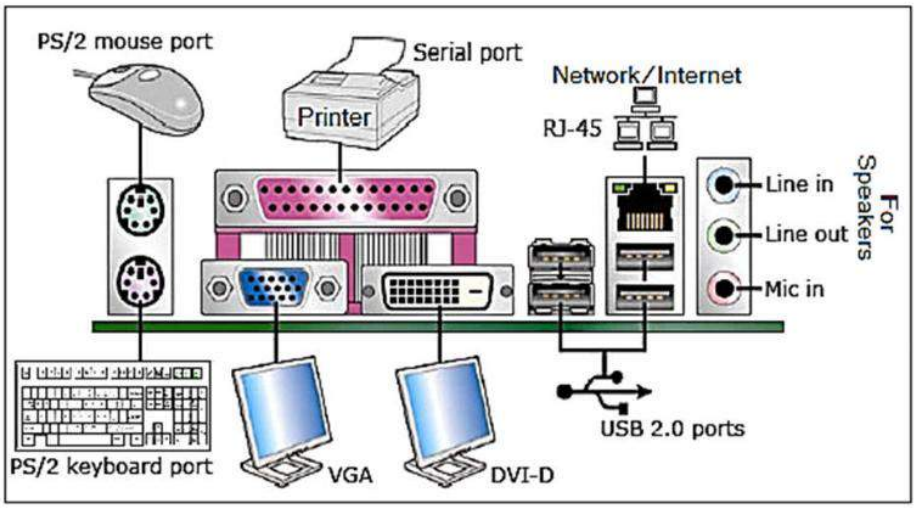


Fig: 4.6 Different Types of Ports

- **Universal Serial Bus (or USB) Port :** This is a very popular and versatile type of port. It can connect all kinds of external USB devices such as external hard disk, printer, scanner, mouse, keyboard, etc. This port was introduced in 1997. Most of the computers provide two USB ports as minimum. In Advanced models, there are four USB ports; very first two ports come with Blue color code and other in black code. Blue code of USB port states that the port is providing the USB 3.0 access. At USB 3.0 port, data travels at 12 or more megabits per seconds. USB compliant devices can get power from a USB port.
- **VGA Port :** It is also called Monitor Port and it is used to connect monitor to a computer's video card. It has 15 holes and it is very similar to the serial port connector. However, serial port connector has pins but the VGA port has holes.
- **Power Connector :** This connector is used for providing power supply to computer system. It is three-pronged plug. Right hole for Phase left one is for Neutral and uppermost is used to provide earthen connectivity in case of power leakage or computer component security. It connects to the computer's power cable that plugs into a power bar or wall socket.
- **Modem Port :** This port is also called communication port and it connects a PC's modem to the telephone network. It connects with a RJ-11 type connector.

- **Ethernet Port :** This port is also called LAN port and it connects our PC to a network and high speed Internet. A RJ-45 connector is used to connect the network cable to a computer. This port resides on an Ethernet Card. Data travels at 10 megabits to 1000 megabits per seconds depending upon the network bandwidth.
- **Digital Video Interface, DVI port :** It connects Flat panel LCD monitor to the computer's high-end video graphic cards. It is very popular.

4.8 PC SECURITY TOOLS

Computer security is important because it keeps our data protected. It's also important for our computer's overall health.Proper computer security helps prevent viruses and malware, which allows programs to run quicker and smoother. Over the internet when we try to install a freeware that is not verified then we open our computer to a slew of attacks. For example, we might download a free desktop application and unknowingly install spyware or a browser toolbar along with the application.

Typically, these free applications will have a checkbox installation that we might miss, which allows the spyware or toolbars to be installed. This spyware, in many cases, can track everything we do in our web browser-and these toolbars can potentially slow our entire system down.When we install untrusted freeware, we open our computer system for:Trojan Horses, Spyware, Viruses and much more.

4.8.1 Importance of PC Security tools

When we come to know that our system has got infected with any of the above attacks then we try to install an antivirus after paying charges. We can either purchase it from local vendor or from online vendors. But our Operating System provides us some very significant security tools that are inbuilt and free for use. Windows Defender is built into the latest versions of Windows and helps guard our PC against viruses and other malware. For a PC running an older version of Windows 7, we can download Microsoft Security Essentials. Microsoft Security Essentials is built for individuals and small businesses. Here are some ways Microsoft Security Essentials helps keep our PCs safe without getting in our way or making us worry.

- Real-time protection
- System scanning
- System cleaning
- Windows Firewall integration
- Dynamic signature service
- Rootkit protection

4.9 SOFTWARE UPDATE AND UPGRADE

Update and upgrade are two different ways to make a change to an app or operating system. But the prime difference lies in a number of modifications made and the importance of

those modifications. A software update includes bug fixes, and other small improvements, while a software upgrade changes the version of software.

4.9.1 Software Update

An update is a patch that is made available after the product has been released, often to solve problems or glitches. When we perform an update, it involves making changes to an app or an operating system is such a way that it doesn't affect its core structure. So, most of the frequent changes made to our computer like bug fixes, security patches, adding support for drivers and newer hardware, etc. can be termed as an Update. An update is often small in size, and it might take a couple of minutes to perform one. Updates are often free and they are often necessary.

4.9.2 Software upgrade

An upgrade is the replacement of an older version of one product to a newer one. When a set of changes made to software are significant, we can call it an Upgrade. A switch from Ubuntu 16.04 to Ubuntu 17.04 would be called an upgrade, not update.

An upgrade mostly includes important changes to the GUI and a variety of new features and options which are not in the existing version of a software or operating system. Its size can go up to several gigabytes. An upgrade would cost money and they are often not necessary

4.10 MS OFFICE INSTALLATION

Microsoft Office is the full suite of Microsoft productivity software, comprising of Word, Excel, PowerPoint, OneNote, Publisher and Access. These programs represent Microsoft's key products besides the operating systems themselves. It is probably the most reliable and widely used commercial software in the world. The Office suite contains all the programs that we are likely to need in an office environment, with the majority of companies using the Windows operating system and Microsoft Office.

4.10.1 Installing MS Office (Example using Office 2013)

Proceed with the installation using the following steps:

- Open the folder that contains the installation files for MS Office.
- Select the version of Windows Office that we wish to install (32-bit or 64-bit).
- Double click on the file setup.exe.
- Read the license agreement, click on the checkbox **- I accept the terms of this agreement** as shown in Fig. 4.7 and then click **Continue.**

- Click **Install Now** as shown in Fig. 4.8.

Fig: 4.7

Fig: 4.8

Note : If you have a previous version of Microsoft Office installed in your computer, this button will read "Upgrade."

- Wait while the software is installed. Installation progress will be shown using Progress bar.
- Once the installation is complete, click **Close** as shown in Fig. 4.10.

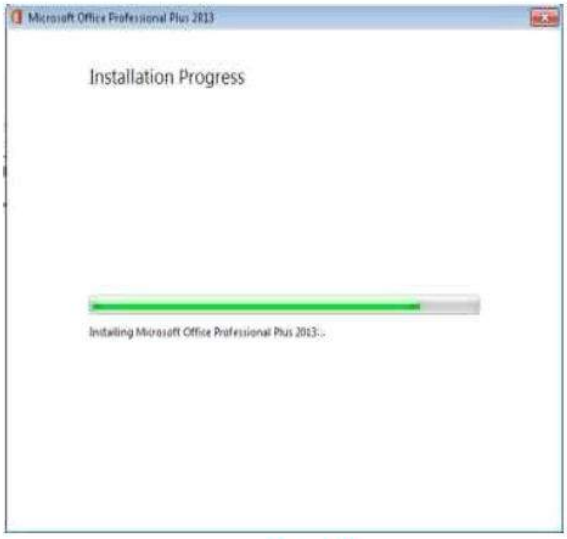


Fig: 4.9

Fig: 4.10

4.10.2 Activation instructions (Example of office 2013)

- From the start menu click All programs → Microsoft Office 2013, then click on any software in the folder (e.g. Word 2013, Excel 2013) to open it.
- The Activate Office window will open. Click **"Enter the product key instead".**
- Enter the product key and then click **Continue.**

4.11 INTRODUCTION TO WINDOWS OPERATING SYSTEM

An Operating system (OS) is software which acts as an interface between the user and computer hardware. Every computer must have at least one OS to run other programs. Applications like Chrome, MS Word, Games, etc. needs an environment in which it will run and perform its task. The OS helps us to communicate with the computer hardware without knowing how to speak the computer's language. It is not possible for the user to use any computer or mobile device without having an operating system in it.

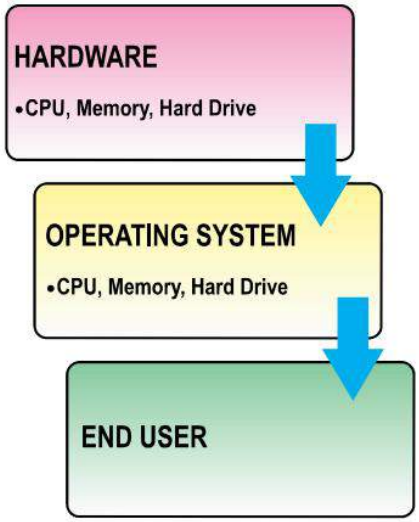


Fig 4.11

Microsoft Windows has seen nine major versions since its first release in 1985. Over 29 years later, Windows looks very different but somehow familiar with elements that have survived the test of time, increases in computing power and - most recently - a shift from the keyboard and mouse to the touchscreen. Following is an overview of some latest windows operating systems that are widely used:

- **Windows 10 :** Windows 10 is the ninth version of Windows. It is designed to unify all Windows platforms across multiple devices, including Windows Phone and tablets, with universal apps that can be downloaded from the Windows Store and run on all Windows devices

  Windows 10 represents another step in Microsoft while bringing back the Start menu and more balances to traditional desktop computer users. Some interesting features include the ability to switch between a keyboard and mouse mode and a tablet mode.

- **Windows 8.1 :** A free point release to Windows 8 introduced in October 2013, Windows 8.1 marked a shift towards yearly software updates from Microsoft and included the first step in Microsoft around its new visual interface.

  Windows 8.1 re-introduced the Start button, which brought up the Start screen from the desktop view of Windows 8.1. Users could also choose to boot directly into the desktop of Windows 8.1, which was more suitable for those using a desktop computer with a mouse and keyboard than the touch-focused Start screen.

- **Windows 7 :** Windows 7 was first released in October 2009. It was intended to fix all the problems and criticism faced by Vista, with slight tweaks to its appearance and a concentration on user-friendly features and less "dialogue box overload".

  It was faster, more stable and easier to use, becoming the operating system most users and business would upgrade to from Windows XP, forgoing Vista entirely.

4.12 INTRODUCTION TO THIN CLIENT TECHNOLOGY

Thin Clients are compact devices with few moving parts and locally stored programs. They connect to servers to perform computer roles and run remote display protocols to access hard drives in secure data centres. This process instantly delivers virtual applications and desktops to end users. Thin Client technology is widely regarded as an effective virtual desktop computing model. This is because it is a secure device where programs, applications, memory, and sensitive information are stored securely in a data center instead of the device itself. As a result, Thin Clients are viable alternatives to regular PCs for businesses which demand flexibility, energy efficiency, improved data security, and longer IT infrastructure lifespan.

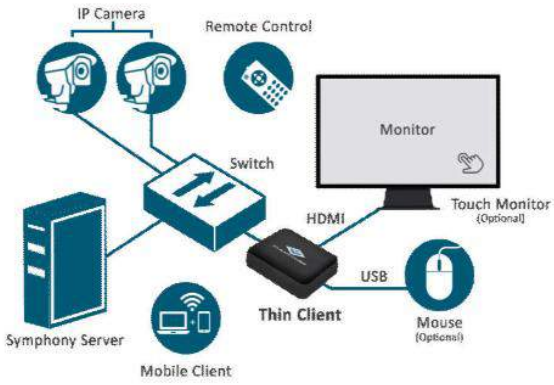


Fig 4.12 Thin Client Technology

4.13 CONTROL PANEL

The Control Panel is a feature of the Windows operating system that allows the user to modify system settings and controls. It includes several small applications, or control panels, that can be used to view and change hardware or software settings. Some examples of hardware control panels are Display, Keyboard, and Mouse settings. Software control panels include Date and Time, Power Options, Fonts, and Administrative Tools.

Fig 4.13 Control Panel

The Windows Control Panel can be accessed by clicking the Start menu and selecting Control Panel. Control Panel can be viewed in either Category View or Classic View. Category

View arranges the control panels into sections, while Classic View shows them all at once. While the Category View is designed to make locating different settings easier, people familiar with most of the control panels often find the Classic View more efficient. Let's Discuss about Hardware Control Panel in details as below:-

4.13.1 Display Properties:

Microsoft Windows has a built in feature allowing us a wide range of control over the visual display. This feature is called the Display Properties Panel. Once we have learned how to manage the Display Properties Panel, we will be able to shrink or enlarge text, modify system colors and fonts, or even change the resolution of the display itself. Let's study it:-

4.13.1.1 Opening the Display Properties Panel : There are two basic ways to open the panel. Following are the steps for the first way to open display properties:

- Click on the window's **Start** button,
- Select **Settings → Control Panel,** Control Panel Items will appear on the screen.
- Click the **"Display"** button to open the **Display Properties** panel.

The **second way** to open the panel is to right click on the empty portion of the desktop and then select **"Properties or Personalize"** as shown in Fig. 4.14 from the drop-down menu. A window as shown in the following figure will open:

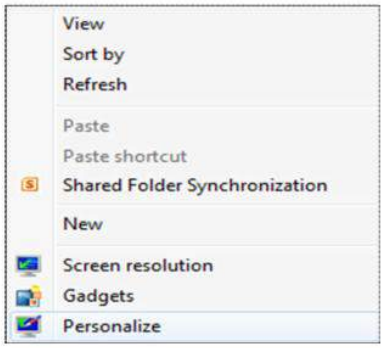


Fig 4.14 Display Properties

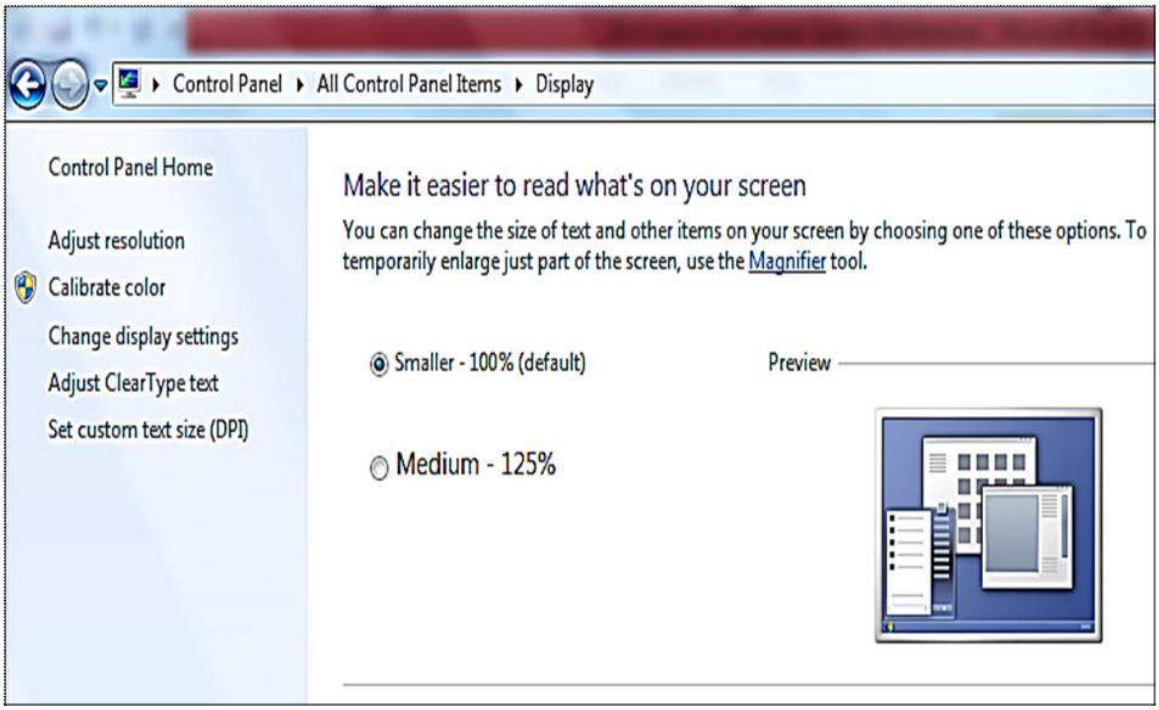


Fig 4.15 Display Properties Panel

Display Properties panel has following properties:

- **Adjust resolution :** It is used to change the resolution of the display screen.
- **Calibrate Color :** It is used to improve the colors on display.
- **Change display settings :** It is used to change the appearance of window components.
- **Adjust clear Type Text :** It is used to improve the readability of text on LCD screen.
- **Set customize text size (DPI) :** It is used to change the size of text, apps and other items.

4.13.2 Mouse and Keyboard:

From the control panel, we can adjust many settings related to our computer's keyboard and mouse. Following description shows about it:

4.13.2.1 Keyboard : Computer users can change some settings and features of a computer keyboard. The numbers of settings and features that can be changed depend on the type of keyboard used. To access keyboard settings for our computer keyboard, follow the steps given below:

- Open the Control Panel (**Start → Settings → Control Panel**)
- Find and click on the **Keyboard** icon. (If we are not viewing the Control Panel as icons, change the View by to Large or Small icons in the top-right corner of the Control Panel.)

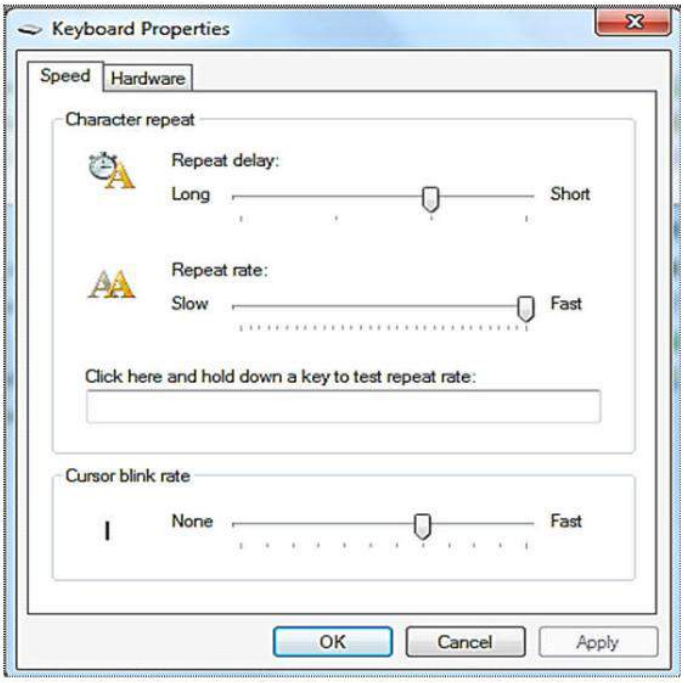


Fig 4.16 Keyboard Properties

Keyboard Properties window have two tabs: Speed and Hardware, which are explained below:

- **Speed tab :** This tab is used to change some basic settings for our keyboard as shown in the figure 4.16 above:
  - We can set the **Repeatdelay** and **Repeat rate** using the sliders provides in the **Character repeat** section.
  - We can set the **Blinking rate of cursor** using the slider provided in the **Cursor blink rate** section.
- **Hardware Tab :** The Hardware tab displays the keyboard that is currently installed, as well as its status.

4.13.2.2 Mouse : Mouse is one of the most common ways which we use to interact with our computers.So it's natural that people will have different preferences when it comes to using a mouse. If we are left-handed, switching our primary mouse button can make using the computer much easier. We can also change how fast the pointer moves, the speed with which we need to double-click, and more. To access mouse settings, follow the steps given below:

- Open the Control Panel **(Start → Settings → Control Panel)**
- Find and click on the **Mouse** icon. (If we are not viewing the Control Panel as icons, change the View by to Large or Small icons in the top-right corner of the Control Panel).

  Once the Mouse Properties window is open we can change some basic settings for our mouse. There are 5 tabs in Mouse Properties dialog box: Buttons, Pointers, Pointer Options, Wheel and Hardware:

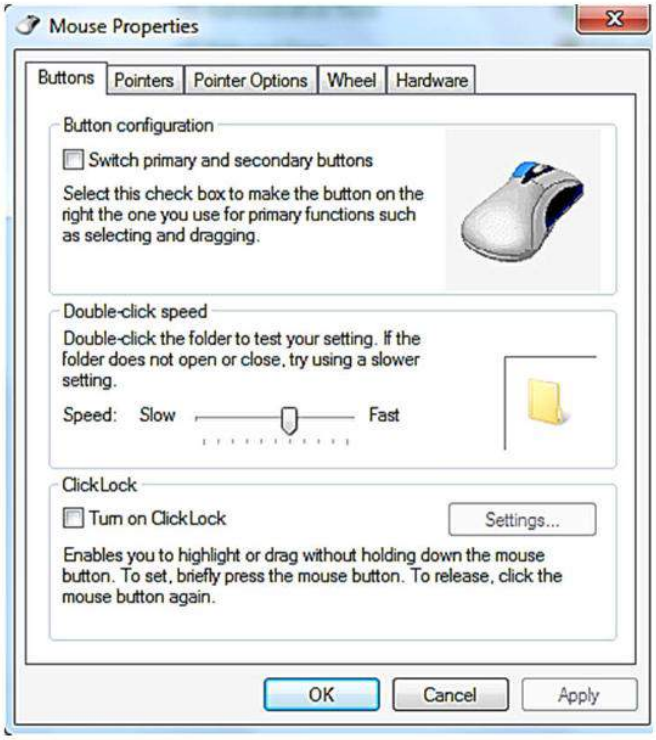


Fig 4.17 Mouse Properties

Some of the common mouse settings are explained below:

- **Buttons tab :** The Buttons tab allows us to adjust the settings for the physical buttons of a mouse. Using this tab,
  - We can switch the primary mouse button from the left to the right.
  - We can also adjust the double click speed using the slider.
  - We can toggle Click Lock on, which allows us to perform click-and-hold actions without having to hold the mouse button down.
- **Pointers tab :** Pointer tab is used for these settings. We can do the following using this tab:
  - We can change the cursors for all the different modes. We can use the "Scheme" menu to choose from any of the pre-installed collections of cursors. We can download custom cursors online also.
- **Pointers Options tab :** We can also change how the mouse cursor moves around on the screen.
  - The slider in the Motion section allows us to adjust how quickly the mouse moves around the screen. We'll be able to test the effects as soon as we adjust the slider. The **"Enhance pointer precision"** check box will turn on mouse acceleration, which can make moving it around more natural.
  - The **"Snap To"** check box, when enabled, will automatically move the cursor to the default button on any windows that appear.
  - The **"Visibility"** section allows us to enable a trail for the pointer, as well as hide the pointer when we're typing.
  - We can also make the pointer emit circles to help us to locate it when we press Ctrl key from keyboard.
- **Wheel tab :** We can change how fast your wheel scrolls. The settings in the Wheel tab affect how fast we can scroll through documents and web pages.
  - The **"Vertical Scrolling"** speed is dictated by lines-per-click. We can also set it to scroll a whole screen at a time.
  - The **"Horizontal Scrolling"** speed is dictated by characters at a time. Not all mice support horizontal scrolling.
- **Hardware Tab :** The Hardware tab displays the mice that are currently installed, as well as their status.

4.13.3 Date and Time

Current date and time always show in the notification area of the taskbar. We can adjust and change many settings related to the date and time. Windows control panel can be used for this purpose. Following description explain about it:

Fig: 4.18 Task Bar

- Open the Control Panel (Start → Settings → Control Panel)
- Find and click on the **Date and Time** icon. (If we are not viewing the Control Panel as icons, change the View by to Large or Small icons in the top-right corner of the Control Panel.)

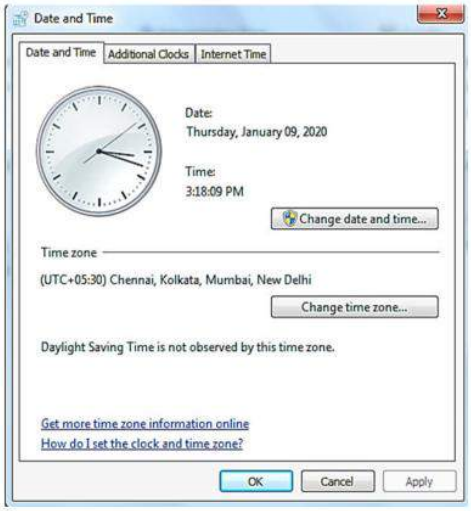


Fig. 4.19 Date & Time

4.13.3.1 Change Current Date and Time : Once the Date and Time Properties window is open we can change some basic settings for our Computer.

- In the Date and Time window, under the **Date and Time** tab, click the **Change date and time...** button.
- Make your adjustments and click OK.
- Click OK on the Date and Time window to save the changes.

4.13.3.2 Adjusting the time zone : We can also change the time zones according to the country we live in, using Date and Time Window:

- As shown in the fig 4.19 in the Date and Time window from above, under the Date and Time tab, click the Change time zone... button.
- Select the new time zone in the Time zone drop-down field and click OK.
- Click OK on the main Date and Time window to save the time zone change.

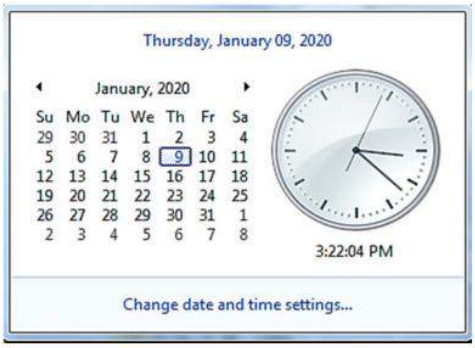


Fig. 4.20

4.13.4 Devices and Printers

The Devices and Printers panel was first introduced in Windows 7 with the aim of providing a user friendly way to interact with external devices connected to our computer.

We can open Devices and Printers window using the Control Panel. In the Devices and Printers window, we can view our own computer along with the external devices connected to it. The list of included devices is: smartphones, portable music players, digital cameras, webcams, monitors, keyboards, mouse, printers, scanners, Bluetooth adapters, external hard drives, media extenders and network devices connected to our computer.

4.13.5 Regional Settings

Wecan access the regional settings by opening the Control Panel and clicking the "Region and Language" or "Region" icon (Region and Language iconin windows 7, Region icon in Windows 10). Windows displays the Language, and Region dialog box.

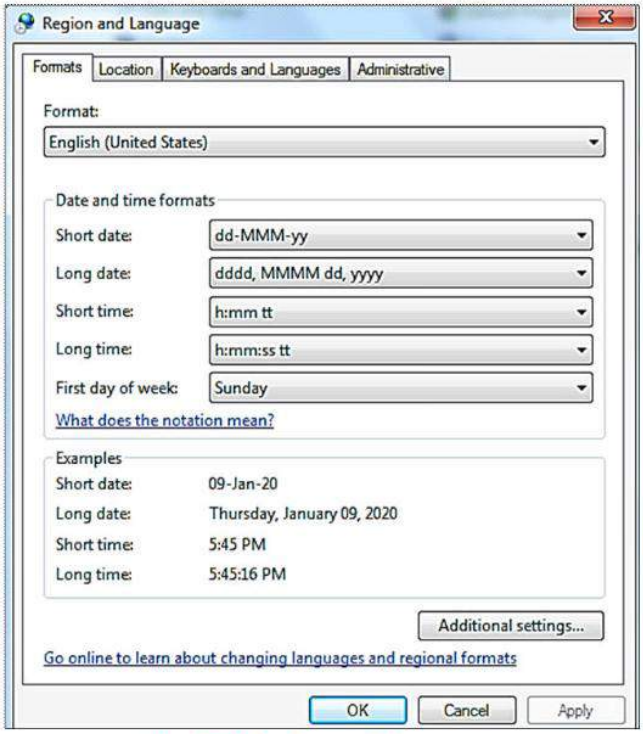


Fig: 4.21 Region and Language

Using the "Region and Language" window, we can change the formats of date, time, numbers, and currency:

- Using **Formats** drop down list, we can select the country for which we want to use formats of date and time, numbers and currency.
- To customize the formats of date and time, numbers and currency for the selected region, click on the **"Additional Settings"** button. **Customize Formats** dialog box will appear now.
- We can customize date and time, number and currency formats using this dialog box as per our requirements. After customizing the settings, click on "Apply" and then "OK" to save any changes.
- Now click on "OK" again to close the "Regional and Language" window.

4.13.6 Fonts

A font is the combination of typeface and other qualities, such as size, pitch, and spacing. For example, Times New Roman is a typeface that defines the shape of each character. Within Times New Roman, however, there are many fonts to choose from - different sizes, italic, bold, and so on. Times, New Roman, Calibri, Arial, AnmolLipi, Joy, Asees, Raavi, Gurbani, Hindi etc. are the examples of commonly used fonts. We can add or remove fonts in our computer using the Fonts window in Control Panel.

Installing a font allows us to use that font when we format text in our documents. First of all download a new font from the Internet. Open the folder containing the new font we'd like to