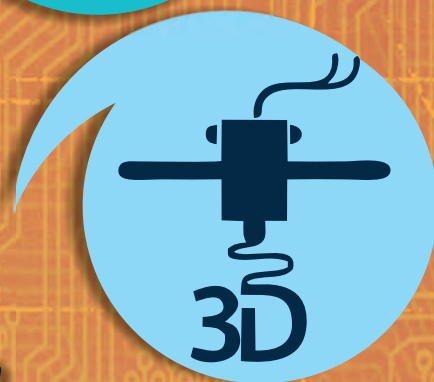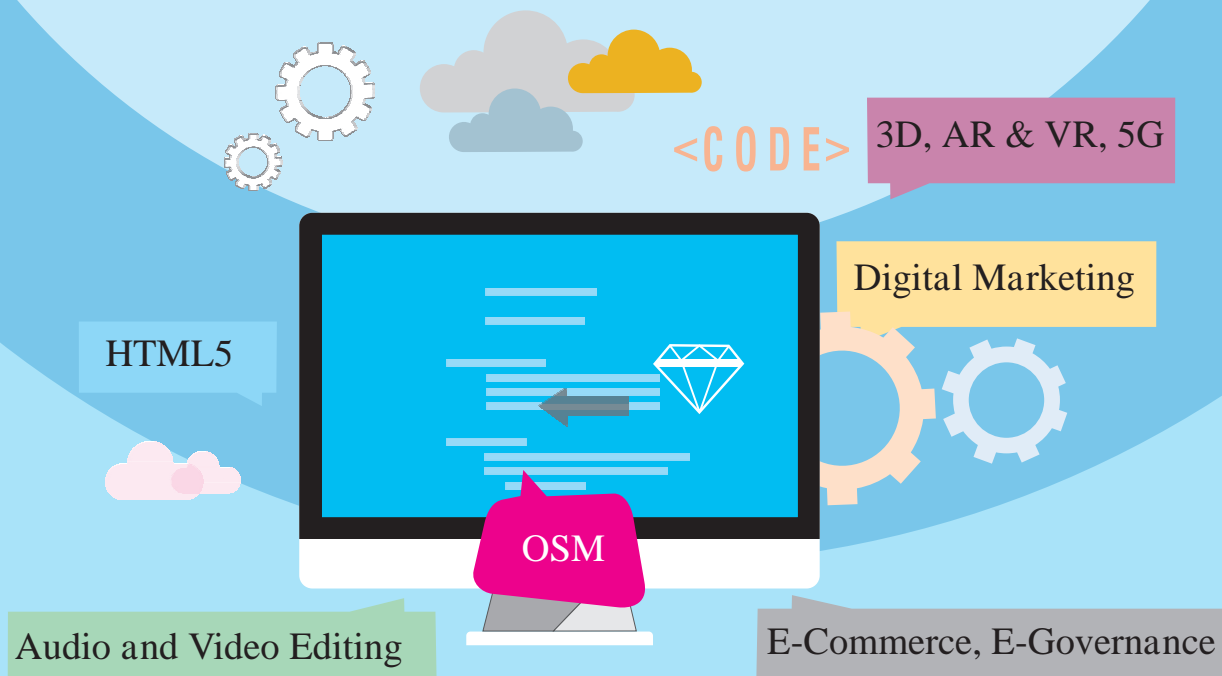# INFORMATION TECHNOLOGY

Standard Twelve

ARTS

The Coordination Committee formed by GR No. Abhyas - 2116/(Pra.Kra.43/16) SD - 4 Dated 25.4.2016 has given approval to prescribe this textbook in its meeting held on 30.01.2020 and it has been decided to implement it from academic year 2020-21.

INFORMATION TECHNOLOGY

STANDARD - TWELVE

(Arts)

<CODE>

3D, AR & VR, 5G

Digital Marketing

HTML5

OSM

Audio and Video Editing

E-Commerce, E-Governance

Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune.

YTET43

The digital textbook can be obtained through DIKSHA App on smart phone by using the Q.R. Code given on title page of the textbook and useful audio-visual teaching-learning material of the relevant lesson.

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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

Foreword

Dear Students,

Congratulations to all of you for the successful completion of Std XI and welcome to the second year of Higher Secondary Education. The syllabus of Information Technology **(Arts)** at Higher Secondary Level has been revised and implemented in view of the fact that computer is used currently as a tool for various applications, especially in the field of e-Banking, e-Commerce, e-Governance, etc. Higher studies and placements, at present, greatly demand human resources with adequate knowledge in computer applications and information technology.

The Information Technology aims to equip students the knowledge, skills and attitudes to become productive employees in the area of computer technology. In this course, you all will gain a perspective to become a successful entrepreneur in Information technology and allied sector. Scope of this textbook also provides you all with the foundation for higher studies. Information technology is one of the most significant growth catalysts for the Indian economy. I am sure after completion of HSC with IT, you will acquire skills and competency to any enter in the upcoming job market.

In Class XI, the syllabus focused on the fundamentals of computer, computer network, basics of website designing and some knowledge of database. You all are also familiar with web page designing. The image creation and manipulation tools such as GIMP a bitmap graphic software and Inkscape a professional quality vector graphic software are there.

The syllabus of Class XII Information Technology (Arts) is a continuation to that of Class XI. Hence the textbook designed in accordance with the syllabus, begins with some advance features of HTML5. Open source softwares like Kdenlive a free and open-source video editing software and Audacity as a digital audio editor and recording software are introduced. **Open Street Map,** (OSM) the project that creates and distributes free geographic data for the world is added in the syllabus along with new technologies such as 3D printing, AR, VR. The concepts such as E-commerce and E-Governance will make students aware about the digitalization process.

I hope this book will meet all the requirements for stepping to levels of higher education and pave the way to the peak of success. Each unit comprises of simple activities and demonstrations which can be done by you on your own.

It is sure if you carefully study the text and practice the laboratory exercises, you will develop confidence in working with website development, web hosting, web analyzing and update your knowledge with new and current technologies.

(Vivek Gosavi)
Director
Maharashtra State Bureau of Texbook
Production and Curriculum Research, Pune

Pune
Date : 21 February, 2020
Bharatiya Saur : 2 Phalguna 1941

Dear Teacher,

The subject Information Technology **(Arts)** is an optional subject of the Higher Secondary Education. The content is developed in view of the fact that it should be useful to the students for their higher studies and they should be able to use computer as a tool. Besides, if somebody wishes a shift towards the IT field in higher education, the syllabus can cater to their needs. Although the field of IT continues to expand rapidly, it is not feasible to expand the size of the curriculum proportionately. As a result, the syllabus has been designed in such a manner to inculcate the current technical knowledge among the students.

The textbook on Information Technology (Arts) is developed as per the approaches and methods used in recent era of internet and web. As the curriculum is activity-based, process-oriented and based on constructivism, it demands higher level proficiency and dedication from the part of the teachers for effective teaching.

This textbook takes two aspects into consideration - **knowledge domain and process domain.** The knowledge area of the curriculum of Class XII is a continuation to that of Class XI. The programming aspects to solve complex problems and handle complex data are introduced. Since we are in an era of Internet, a wide coverage is given to the contents required for designing web pages and developing web applications. Audacity software is included as it has features of recording audio from multiple sources, post-processing of all types of audio, trimming and fading in and out. The video editing software Kdenlive is incorporated to create, move, crop and delete video clips, audio clips, text clips and image clips. The concepts such as E-commerce and E-Governance is also included. The knowledge about the same is must for today's generation.

The process domain gives importance to gain the Creative and logical method and develop interest for deeper investigation. The recent technologies in IT such as 3D printing, 5G, AR and VR are included in the syllabus to give the current technological knowledge to the students. While transacting the concepts through activities, it should be ensured that the students are attaining the skills along with learning outcomes.

The Textbook IT (Arts) is prepared by a team of practicing teachers under the guidance of a panel of subject experts. All possible efforts have been taken to make the books learner-friendly and interesting. There is no denying the fact that our teachers are resourceful and committed, and hence directions towards the right path can make the transaction of the curriculum most effective and productive.

Constructive criticism and creative suggestions for improvement of the book are most welcome.

Information Technology
Subject Committee and Study Group
Textbook Bureau, Pune

Competency Statements For Information Technology
Standard - XII (All Streams)

Competency
Theory
1. To create awareness and acquire knowledge about new technology.
2. To acquire in-depth knowledge about technologies related to AI, IOT, 3D Printing, 5G.
3. To enable the student to think and create interest in emerging technology from career point of view.
4. To make students aware about concept of E-commerce.
5. To acquire knowledge about scope of E-commerce.
6. To create awareness about different E-commerce websites and discuss its features.
7. To develop higher order logical skills based on basic knowledge acquired in 11th standard.
8. To make students aware about HTML5's advanced tags while developing web page.
9. To make students competent in scripting language to create dynamic web page.
10. To acquire knowledge about concept of object.
Skill Oriented Practicals (SOP)
1. To inculcate web designing skills using advance tags.
2. To make students confident to create website.
3. To develop skills for programming using DOM.
4. To develop ability to create dynamic web pages using advance features.
5. To develop ability to program for server side scripting.
6. To develop skill to create simple PHP Program.
7. To make student aware about connectivity with database.
8. To develop skill in handling accounting package with advance feature.
9. To make student competent to display and print different accounting report.
10. To acquire skills in recording and manipulating audios.
11. To make student skillful to mix audio.
12. To acquire skills to record, create and manipulate video.
13. To enhance the creative ability by mixing and fusion of the different media.

INFORMATION TECHNOLOGY
STANDARD - TWELVE
(Arts)

INDEX

1 Advanced Web Designing

- Student can design the layout of web pages using CSS.

- Students can learn to design the website.

- Student can design the web form with validations.

- Students can learn concept of image map and Iframe (inline frame).

- The aim is to give the skills to create HTML WebPages, using HTML5 and CSS.

1.1 Advanced Web Designing

We have been introduced to basic terminologies related to creation of web pages. The Hypertext Mark-up Language (HTML) is an evolving language, with different versions supporting different features. HTML5 is currently used because it supports mobile technology. The major browsers are Google Chrome, MozillaFirefox, Microsoft Edge, Safari, Opera and Apple support the features of HTML5.

1.2 Forms in HTML5

In eleventh standard we have studied different controls related to form like text, radio, checkbox, submit, reset, select and textarea.

These controls are used to collect different kinds of user inputs, such as contact details like name, address, single or multiple options from group of options, as well as clearing and submitting data etc.

HTML5 has introduced additional form controls which can also be used for validation purpose.

HTML5 advanced <input> elements

HTML5 introduces a number of new input types.

Input type	Description
<input type="color">	Defines a color picker
<input type="number">	Defines a field for entering a number
<input type="url">	Defines a field for entering a URL.
<input type="image">	Defines an image as a submit button.
<input type="date">	Defines a date picker with the year, month and day
<input type="email">	Defines a field for an e-mail address

Input type	Description
<input type="month">	Defines a month and year control in format is "YYYY-MM"
<input type="range">	Define a range control. Default range is 0 to 100.
<input type="datetime-local">	Defines a date picker that includes the year, month, day and time.
<input type="time">	Defines a control for entering a time.
<input type="week">	Defines a week and year control.
<input type="search">	Defines a text field for entering a search string like a site search or Google search.
<input type="file">	Defines a file-select field and a "Browse" button for file uploads.
<input type="tel">	Used to define input fields that should contain a telephone number.

Input Restrictions

A list of some common input restrictions is given below, few of which can be used for validation purpose.

Attribute	Description
disabled	Specifies that an input field should be disabled.
max	Specifies the maximum value for an input field.
min	Specifies the minimum value for an input field.
pattern	Specifies a regular expression to check the input values.
read only	Specifies that an input field is read only (cannot be changed).
placeholder	This acts as a temporary label showing the purpose of a text field without requiring a label tag.
required	Specifies that an input field is required (must be filled out).
autocomplete	Specifies whether a form or input field should have autocomplete On or Off.
autofocus	Specifies that the input field should automatically get focus when the page loads.
height and width	Specifies the height and width of an <input type="image">
multiple	Specifies that the user is allowed to enter more than one value in the <input> element. This works with input types like email and file.

Some other useful attributes used with <input> are-

1. **id :** This is used to identify the html element uniquely through the document object model.

2. **class:** It is used to apply CSS style to the individual input element.

Examples :

```
<!DOCTYPE html> <html>
<head>
<title>Forms in html 5 </title></head>
<body>
<form> Name: <input type="text"autocomplete><br><br>
E-mail:<input type="email" name="email"><br><br>
Date of Inception: <input type="date" name="bday"><br><br>
Office time: <input type="time" name="usr_time"><br><br>
Number of years completed(between 1 and 100): <input type="number" min="1"
max="100"><br><br>
Office phone number: <input type="tel" name="phone" pattern="[0-9]{2}-[0-9]
{10}" required><br><br>
 Add your homepage:
<input type="url" name="homepage"><br><br>
<input type="image" src="E:/submitbutton.png" alt="click here to submit" >
</form>
</body>
</html>
```

The output is as follows

Name:

E-mail: _

Date of Inception:

Office time:

Number of years completed(between 1 and 100):

Office phone number:

Add your homepage:

SUBMIT >

1.3 <meta> tag

The meta tag is a tag in html that describes some aspects of contents of a webpage. The HTML <meta> tag is used by search engines to search information

that is provided with the webpage. This is empty tag (singular tag) which carries information within its attributes. The <meta> tag is placed between the <head>and </head> tags. Metadata will not be displayed on the webpage.

Attribute of <meta> tag

Attribute	Values	Description
Name	The value of the name attribute can be related to any of the following- i) Author ii) Description iii) Keywords iv) copyright e.g. <meta name = "author" >	Specifies the Name of the meta-data like the author, keywords or description.
Content	It can have any textual matter related to the name as in eg. i. <meta name = "author" content = "Balbharti"> ii. <meta name = "description" content = "Advance web de-signing"> iii.<meta name = "keywords" content = "html5, learn html5, list in html 5">	Here content of author is balbharati. Here the value for content attribute specifies name of the topic advance web designing. Here the values for content attribute are given as keywords like html5 , learn html5 etc.
Charset	UTF-8, Big5 e.g <meta charset="UTF-8"> <meta charset="Big5">	Specifies the character encoding used by the document, This is called a character encoding declaration. UTF-8 For Indian characters Big5 – for Chinese characters
http-equiv	refresh , set-cookie, content-type, expires, e.g. <meta http-equiv="refresh"content="5"> <meta http-equiv="set-cookies"> <meta http-equiv="content-type"content="text/html"charset="Big5"> <meta http-equiv="expires" content="userid=pqr; expires=Wednesday, 8-feb-2018 23:59:59 GMT;">	Used for http response message headers. Here the page will get refresh after every 5 seconds. The browser sends the cookies back to the server. Specifies the character encoding for the document Here page session will get expire at specified date and time.

Example:

```
<!DOCTYPE html>
<html>
      <head>
            <title>meta tag
examples</title>
            <meta name = "authors"
content = "Balbharti">
<meta name = "description" content =
"Advance web designing">
<meta name = "keywords" content =
"html5, learn html5, list in html5">
<meta name="copyright" content
= " copyright Balbharti All right
Reserve">
      </head>
      <body>
            <p> Welcome to HTML5
            </p>
      </body>
</html>
```

1.4 Cascading Style Sheets in HTML5

CSS stands for Cascading Style Sheets. CSS describes how HTML elements are to be displayed on screen, paper, or in other media. CSS saves a lot of work. It can control the layout of multiple web pages all at once. CSS allows you to control the look and feel of several pages by changing a single source.

CSS Syntax
• A CSS rule set contains
  ➢ a selector and
  ➢ a declaration block.

Selector   Declaration Block

H1{color:yellow;font-size:11px}

Property   Value
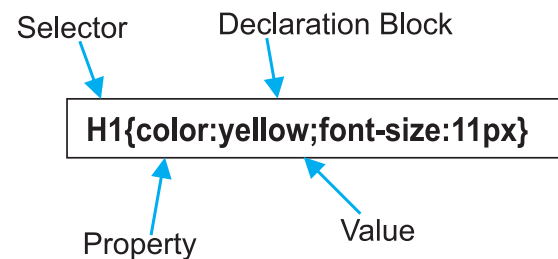
Selector : Selector indicates the HTML element you want to style. It could be any tag like <h1>, <body> etc.

Declaration Block : The declaration block can contain one or more declarations separated by a semicolon. For the above example, there are two declarations:

1. color : yellow;
2. font-size :11 px;

Each declaration contains a property name and value, separated by a colon.

Property : A Property is a type of attribute of HTML element. It could be color, border etc.

Value : Values are assigned to CSS properties. In the above example, value "yellow" is assigned to color property.

```
Selector{Property1: value1; Property2:
value2}
```

Types of CSS

There are three methods of implementing styling information to an HTML document.

1. **Inline CSS**
2. **Embedded stylesheet or Internal CSS**
3. **External CSS**

1. **Inline stylesheet :** It uses the style attribute in the HTML start tag.

Inline CSS is used to apply CSS on a single line or element.

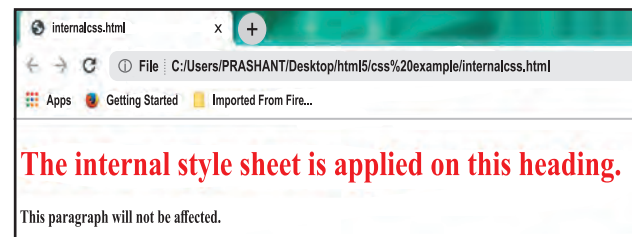**For example :**

<p style="color:blue">Hello CSS</p>

2. **Embedded stylesheet or internal CSS :** This is used to apply CSS on a single document or page. It can affect all the elements of the page. It is written inside the style tag within head section of html.

For example :

```
<!DOCTYPE html>
<html>
<head>
<style>
h1{color: Red;}
```

```
</style></head>
<body>
<h1>The internal style sheet is applied on this heading.</h1>
<p>This paragraph will not be affected.</p>
</body>
</html>
```

The output of above program is as follows-

The internal style sheet is applied on this heading.

This paragraph will not be affected.

CSS Properties

Property	Use	Value	Example
Color	Changes the color of the text	Color name	h1{color: maroon}
Background-color	To set the background color in your webpage	Color name	body{background-color:yellow}
Font-weight	Used to bold text	bold or 100, 200…900	p{font-weight:300}
Font-style	Used to italicize text	Italic, oblique or normal	p{font-style:italic}
Text-decoration	This property is used to add 1. strike-through marks 2. underline 3. overstrike 4. to remove underlines from links	1. line-through 2. underline 3. overline 4. none	p{text-decoration: underline} a{text-decoration: none}
Text-align	This property is use to control the horizontal alignment of any block-level text that are paragraphs, tables and other elements	left, right, center or justify	h1{text-align:center}
Font-family	This is used to control the fonts	Font name	p{font-family:arial}

Property	Use	Value	Example
Font-size	This property allows you to control the size of the font	px, in, mm, cm, pt	p{font-size:10px}
Letter-spacing	This helps in controlling the horizontal spacing between characters of text	px, in, mm, cm, pt	h1{letter-spacing: 5pt}
Padding	This property is used when you want to add padding (blank spaces) around the content of an element.	Pixel	h1{padding:30px}
Border	This property adds a border to a webpage element	Solid, double, groove, ridge, inset, outset, dotted or dashed	h1{border:green}
Background-image	To set an image as the background of your webpage	url("X") where X is the path of image file	body{background-image: url('background.jpg')}
Margin-Left	Sets margin area on the left side of the element.	px,pt,cm etc.	h1{margin-left;10px}

3. **External stylesheet : The external style sheet is generally used when you want to make changes on multiple pages.** It facilitates to change the look of the entire web site by changing just one file. It uses the <link> tag on every page and the <link> tag should be put inside the head section.

For example :

```
<!DOCTYPE html>
<html>
<head>
<link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>
<h1>This is a heading</h1>
</body></html>
```
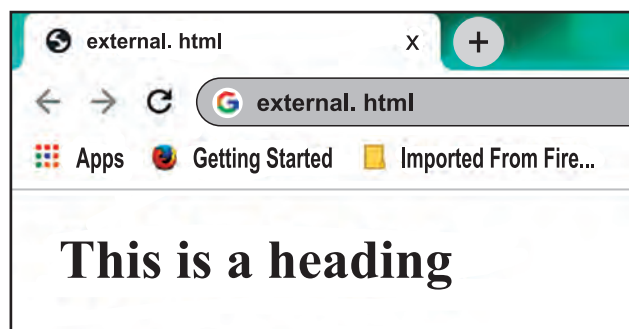
An external style sheet can be written in any text editor, and must be saved with a .css extension. The external css file should not contain any HTML tags.

Here is how the "style.css" file looks like:

Style.css

h1{color:navy;margin-left:20px}

The output is as follows

CSS Id Selector

The Id selector selects the id attribute of an HTML element to select a specific element. An id is always unique within the page so it is unique element. It is written with the hash character(#), followed by the id name.

```
<!DOCTYPE html>
<html>
<head>
<style>
#para1{text-align: center; color: blue}
</style>
</head>
<body>
<p id="para1">Hello Students</p>
<p>This paragraph will not be
affected.</p>
</body>
</html>
```

See the output as follows
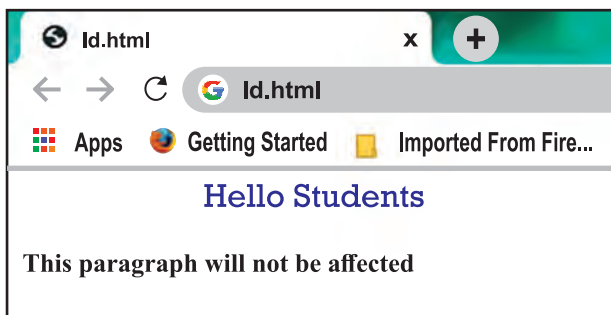
CSS Class Selector

The class selector selects HTML elements with a specific class attribute. **It is used with a period character '.'** (full stop symbol) followed by the class name. **The Class selector is used when you want to change a group of elements within your HTML page.**

The class name should not start with number.

Let's take an example with a class "intro".

```
<!DOCTYPE html>
<html>
<head>
<style>
.intro{text-align:center;color:blue}
</style></head>
<body>
<h1 class="intro">This heading is blue
and center-aligned.</h1>
<p class="intro">This paragraph is
blue and center-aligned.</p>
</body>
</html>
```

The above code results as

This heading is blue and center-aligned.

This paragraph is blue center-aligned.

Class Selector for specific element

To specify only one specific HTML element should be affected then you should use the element name with class selector.

Let's see an example :

```
<!DOCTYPE html>
<html><head><style>
p.intro {text-align: center;color: blue}
</style></head>
<body>
<h1 class="intro">This heading is not
affected</h1>
<p class="intro">This paragraph is
blue and center-aligned.</p>
</body></html>
```

The output is as follows

Universal Selector

The universal selector is used as a wildcard character. It selects all the elements on the Webpages.

```
<!DOCTYPE html>
<html><head><style>
* { color: green; font-size: 20px;}
</style></head>
<body>
This css style will be applied on Entire page.It does not check tag or plain text<br>
<h2>This css is  applied to heading </h2>
<p id="para1">it is applied to first paragaraph</p>
<p>Also to second paragraph !</p>
</body>
</html>
```

Output :

This css style will be applied on Entire page. It does not check tag or plain text

This css is applied to heading

it is applied to first paragraph

Also to second paragraph !

Group Selector

The grouping selector is used to select all the elements with the same style definitions. It is used to minimize the code. Commas are used to separate each selector in grouping.

Let's see the CSS code without group selector.

h1{ text-align:center;color:blue}

*h2{ text-align:center;color:blue}*

p {text-align:center;color:blue}

As you can see, you need to define CSS properties for all the elements. It can be grouped as-

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

Let`s see full code as follows :

```
<!DOCTYPE html>
<html>
<head>
<style>
h1,h2,p{text-align: center; color: blue}
</style>
</head>
<body>
<h1>Hello Heading 1</h1>
<h2>Hello Heading 2 (In smaller font)</h2>
<p>This is a paragraph.</p>
</body>
</html>
```

Output :

Hello Heading 1

Hello Heading 2 (In smaller font)

This is a paragraph
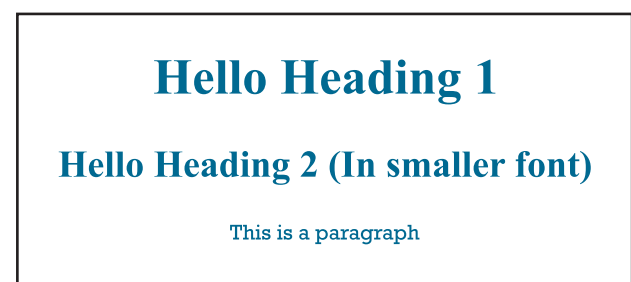
Positioning in CSS

CSS helps to position the HTML elements. The position property is used to set position for an element. The element can be positioned using the top, bottom, left and right properties.

Syntax :

Selector{position:value;top:value;

left:value:bottom:value;right:value}

Where values in positions are fixed, absolute, relative and values of top, bottom, left, right are in pixels

There are four types of positioning in CSS

1. **Static Positioning :** This is a by-default position for HTML elements. It is not affected by the top, bottom, left and right properties.

2. **Fixed Positioning :** This property helps to put the text fixed on the browser. The FIXED property forces an element into a fixed position relative to the browser window. The fixed element will not move, even when the page is scrolled.

Let`s see the example :

```
<!DOCTYPE html>
<html><head><style>
p.fixed{position: fixed; top: 50px; right:
5px; color: blue}
</style></head>
<body>
<p>This is paragraph 1</p>
<p>This is paragraph 2</p>
<p>This is paragraph 3</p>
<p   class="fixed">This   is   the   fix
positioned text.</p>
</body>
</html>
```

Output :
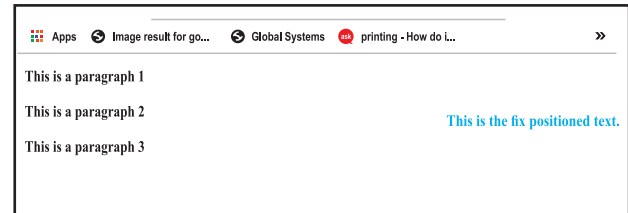
3. **Relative Positioning :** The relative positioning property is used to set the element relative to its normal position.

4. **Absolute Positioning :** This property sets an element in a specific location and it is not affected by the flow of the page. This property positions the element at the specified coordinates relative to your screen top-left corner.

For example :

```
<!DOCTYPE html>
<html><head><style>
.first{position: relative;top: -10px;
right: -10px;}
h2{position: absolute;
left:100px;top:150px}
</style><body>
<h1 class="first">This is heading 1
</h1>
<h2>This is heading 2</h2>
</body></html>
```

Output :

In above output the Level 1 headings with class="first"have a relative position 10 pixels above and 10 pixels to the right of it's original position.

All level 2 headings will be positioned 100 pixels from the left of the browser window and 150 pixels from the top of the browser window.

Float Property

Float is a CSS property written in CSS file or directly in the style of an element. The float property defines the flow of content.
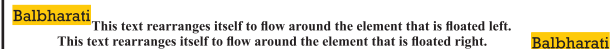
Following are the types of floating properties :

1. **float : left :** This keeps the element float on left side of the container

2. **float : right :** This keeps the element float on right side of container

3. **float : none :** This is default property i.e. this shows the element as it is.

For example :

```
<!DOCTYPE html>
<html><head>
<title>Float Example</title></head>
<style>
  .float-left{float:left;font-size:20px;background-color:gold}
  .float-right{float: right;
font-size:20px;background-color:gold}
</style>
<h2 class="float-left">Balbharati
</h2><p>This text rearranges itself to flow around the element that is floated left.
</p>
```

```
<h2 class="float-right">Balbharati
</h2>
<p>This text rearranges itself to flow around the element that is floated right.  </p>
</body></html>
```

Output

Balbharati This text rearranges itself to flow around the element that is floated left. This text rearranges itself to flow around the element that is floated right. Balbharati

Display property

The Display property in CSS defines how the components (div, hyperlink, heading, etc) are going to be placed on the web page. It specifies how the element is displayed. As the name suggests, this property is used to define the display of different parts of a web page.

Syntax :

Display : value;

Where values are :

Inline : It is used to display an element as an inline element.

Block : It is used to display an element as an block element. It starts on a new line, and takes up the whole width of the browser window.
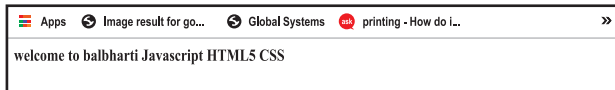
Block-inline : This value is very similar to inline element but the difference is that you are able to set the width and height.

None : The element is completely removed.

Let's see an example

```
<!DOCTYPE html>
<html>
<head>
<style>
p {
display: inline;
}
</style>
</head>
<body>
<p>welcome to balbharti</p>
<p>Javascript</p>
<p>HTML5</p>
<p>CSS</p></body></html>
```

Output :

| Apps | Image result for go... | Global Systems | printing - How do i... | » |
| welcome to balbharti Javascript HTML5 CSS |

Example 2 :

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>Example of CSS display</title>
<style type="text/css">
    a {
        display : block;
        background-color:orange;
    }
</style>
</head>
<body>
<p>
<a href="https://www.ebalbharti.in" >
Visit balbharti</a>
<br>
</p></body>
</html>
```
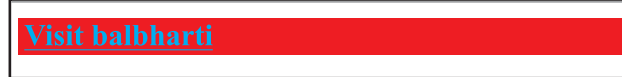
Output :

Visit balbharti

Based on the CSS properties studied so far, the representation of semantic tags displayed in 11th standard textbook can be coded as follows.

Example 1 :

Use of semantic tags and CSS.

```
<!DOCTYPE html>
<html>
<head>
<style>
header{background-color:pink;width:100%;height:20%}
nav{background-color:skyblue;width:100%;height:20%}
aside{background-color:grey;width:40%;height:42%;float:right}
section{background-color:lightyellow;width:60%;height:10%;float:left}
article{background-color:violet;width:60%;height:40%}
footer{background-color:orange;width:100%;height:10%}
</style>
</head>
<body>
<header>
<h1>HTML5 includes new semantics</h1>
<p>It includes semantic tags like header, footer, nav
<h1>Example of complete HTML5 Basics</h1>
<h2>The markup of the future under
```

development.</h2></p></header>

<nav>The nav element represents a section of navigation links. It is suitable for either site navigation or a table of contents.
http://www.w3schools.com

Balbharti website
</nav>

<aside>

<h1>Other education based websites of State</h1>

State Board website

Pune university website

</aside>

<section>

<h1>Impressive Web Designing</h1>

<p>The aside element is for content

that is tangentially related to the content around it, and is typically useful for marking up sidebars.</p>

</section>

<section>

  <h1>Articles on:Article tag</h1>

</section>

  <article>

  <p>The article element represents an independent section of a document, page or site. It is suitable for content like news or blog articles,

forum posts or individual comments.</p>
  </article>

<footer>© 2018 Balbharti.</footer>

</body></html>

1.5 Ordered list or numbered list

The <ol> tag defines an ordered list. An ordered list can be numerical or alphabetical.

Attributes of <ol> tag-

Attribute	Values	Description
Type	"1" /"a"/"I"/"i"	1 is default value and other values specify the numbering type for the used items.
Reversed	Reversed	This attribute specifies that the items of the list are specified in the reverse order.
Start	Number	Specifies the starting number of the first item in an ordered list.

```
<!DOCTYPE html>
<html><body>
<h3>List of Topics</h3>
<ol>
<li>Basics of IT</li>
<li>HTML 5</li>
<li>PostgreSQL</li>
</ol>
<h3>List of Topics start with series 50</h3>
<ol start="50">
<li>Basics of IT</li>
<li>HTML 5</li>
<li>PostgreSQL</li>
</ol></body></html>
```

Output :

> **List of Topics**
>
> 1. Basics of IT
> 2. HTML 5
> 3. PostgreSQL
>
> **List of Topics start with series 50**
>
> 50. Basics of IT
> 51. HTML 5
> 52. PostgreSQL

Example 2 :

```
<!DOCTYPE html>
<html>
<body>
<h3>List of Topics in reverse sequence</h3>
<ol reversed>
<li>Basics of IT</li>
<li>HTML 5</li>
<li>PostgreSQL</li>
</ol></body></html>
```

Output :

> **List of Topics in reverse sequence**
>
> 3. Basics of IT
> 2. HTML 5
> 1. PostgreSQL

1.6 Unordered list or bulleted list

An unordered list created using the <ul> tag, and each list item starts with the <li> tag. The list items in unordered lists are marked with bullets (small black circles), by default.

Example : 1

```
<!DOCTYPE html>
<html>
<head>
<title>Example of HTML Unordered List</title>
</head>
<body>
<h3>HTML Unordered List</h3>
<ul>
<li>Basics of IT</li>
<li>HTML 5</li>
<li>PostgreSQL</li>
</ul></body></html>
```

Output :

> **HTML Unordered List**
>
> • Basics of IT
> • HTML 5
> • PostgreSQL

Attributes of <ul> tag

Attribute	Values	Description
Type = disc/ circle/square (use style (css) instead of type attribute in HTML5. Type attribute is supported by previous versions of HTML)	style="list-style-type:disc" e.g <ul style="list-style-type:disc;"> style="list-style-type:circle" e.g <ul style="list-style-type:circle"> style="list-style-type:square" e.g <ul style="list-style-type:square"> style="list-style-type:none" e.g <ul style="list-style-type:none;">	Sets the list item marker to a bullet (default) Sets the list item marker to a circle Sets the list item marker to a square The list items will not be marked

Note : HTML5 does not support bullets, circle and square value of type attribute instead you use CSS style.

1.7 Definition list

To define a definition list <dl> tag is used. You can create items in definition list with the <dt> and <dd> tags. The <dt> tag is used to define the term whereas the <dd>tag is used to define the term's definition.

Type the following code

```
<!DOCTYPE html>
<html>
<head>
<title>definition List</title>
</head>
```

```
<body>
<h3>Example of HTML definition List</h3>
<dl>
<dt><b>Web</b></dt>
<dd>The part of the Internet that contains websites and web pages</dd>
<dt><b>HTML</b></dt>
<dd>A markup language for creating web pages</dd>
<dt><b>CSS</b></dt>
<dd>A technology to make HTML look better</dd>
</dl>
</body>
</html>
```

Output :

```
Example of HTML definition List

Web
        The part of the Internet that contains websites and web pages
HTML
        A markup language for creating web pages
CSS
        A technology to make HTML look better
```

Nested list

List within another list either order list or unordered list is called nested list.

Examples : Single level nested list

```
<!DOCTYPE html>
<html >
<head>
<title>Example of HTML nested list</title>
</head>
<body>
<h3>HTML Nested List</h3>
<ol>
<li>Introduction to IT</li>
<li>Introduction to DBMS</li>
<ul style="list-style-type:circle">
<li>Definition of DBMS</li>
<li>applications of DBMS</li>
<li>Advantages of DBMS</li>
</ul>
<li>Postgresql</li>
</ol></body></html>
```

Output :

```
HTML Nested List

    1.  Introduction to IT
    2.  Introduction to DBMS
            Definition of DBMS
            applications of DBMS
            Advantages of DBMS
    3.  Postgresql
```

Multi level list :

```
<!DOCTYPE html>
<html >
<head>
<title>nested list</title>
</head>
<body>
<h3> Multi-level list Nested List</h3>
<ul>
<li>Daily computing</li>
<li>Web design</li>
<ol>
<li>html 5</li>
<li>hyperlink</li>
<li>Inserting Images</li>
</ol>
<li>Javascript</li>
<ul style="list-style-type:circle">
<li>conditional structure</li>
<ul style="list-style-type:square">
<li>If statment</li>
<li>If else statement</li>
<li>case statement</li>
</ul>
<li>loop statement</li>
</ul>
</ul>
</body>
</html>
```

Output :

```
Multi-level list Nested List

    • Daily computing
    • Web design
            1. html 5
            2. hyperlink
            3. Inserting Images
    • Javascript
            conditional structure
                    If statement
                    If else statement
                    case statement
            loop statement
```

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1.8 Inserting audio and video in HTML 5

HTML5 new specifications enables users to have a far more control over audio on webpages.

HTML5 features include native audio and video support without the need for Flash. HTML5 includes special elements (tags) allowing to include video and audio and to define controls.

Common Audio Formats :

mp3 : An audio format from MPEG(Moving / Motion Pictures Experts Group).

aac : Advanced Audio Coding, standard format on Iphone, youtube etc.

ogg : An Open container and free audio format.

<Audio >Tag

The <audio> element enables you to embed(or add) audio files on Webpages.

Declare the audio tag, and specify the source attribute with the Audio file location.

Syntax :

<audio src="sample.mp3" type="audio/mpeg" controls>
</audio>

Note: Autoplay, controls, muted are without any values.

Attributes of <audio> tag

Attribute	Values	Description
Autoplay	-	The audio will start playing as soon as it is ready
Controls	-	The audio controls should be displayed (i.e. play/pause button etc.)
loop	Value	The audio will start over again, every time it is finished
muted	-	This Specifies that the audio output should be muted
src	URL	Specifies the URL of the audio file

Example :

```
<!DOCTYPE html>
<html>
<body>
<p>Audio Sample</p>
<audio controls>
<source  src="test.mp3"  type="audio/mp3">
</audio>
</body></html>
```

Output :

▶ 0:00 / 0:01 ━━━━━━ 🔊 ⋮

In previous code

The controls attribute is used to add audio controls such as play, pause, and volume.

The"source"element is used to specify the audio files which the browser may use.

Adding audio with multiple sources :

Multiple sources of audios are specified so that if the browser is unable to play the first source then it will automatically jump to the second source.

<source> tag

The <source> tag is used to specify multiple media resources for media elements.

Example :

```
<!DOCTYPE html>
<html>
<body>
<p>Audio Sample</p>
    <audio controls autoplay>
        <source src="test.mp3"
type="audio/mp3">
        <source src="test.ogg"
type="audio/ogg">
        <source src="test.opus"
type="audio/ogg">
    </audio>
</body>
</html>
```

Output :

▶ 0:00 / 0:01 ━━━━━━ 🔊 ⋮

<video>Tag

The HTML <video> tag is used to embed video into your web page, it has several video sources.

There are three different formats that are commonly supported by web browsers – .mp4, .Ogg and .WebM.

Syntax :
<video src="URL" controls></video>

Attributes of <video> tag :

Attribute	Values	Description
Src	URL	Defines link to video file
autoplay	-	Specifies that the video will start playing as soon as it is ready
controls	-	Specifies that video controls should be displayed (such as a play/pause button etc).
height	Pixels	Sets the height of the video player
loop	Value	Specifies that the video will start over again, every time it is finished
muted	-	Specifies that the audio output of the video should be muted

Attribute	Values	Description
poster	URL	Specifies an image to be shown while the video is downloading, or until the user hits the play button
preload	1. auto 2. metadata 3. none	Specifies if and how the author thinks the video should be loaded when the webpage loads
width	Pixels	Sets the width of the video player

The <source> tag is used to specify multiple media resources for video as well as audio media elements.

Example :

```
<!DOCTYPE html>
<html>
<body>
<video width="320" height="240"
controls>
<source src="movie.mp4"
type="video/mp4">
<source src="movie.ogg" type="video/
ogg">
  Your browser does not support the
video tag.
</video></body></html>
```

Output :

1.9 Image map in HTML 5

An image with multiple hyperlinks is called an image map.

Image map is used to connect links to different regions on the webpage. An Image map is created by marking certain regions on an image clickable. These clickable regions are called as **hotspots**.

Image Maps are of two types; Client Side and Server Side. We will confine only to Client Side image map. The tags used to define client side image map are

1. **<Img> :** It is used to insert an image on a web page. To create a client side image map usemap attribute of <img> is used with value which is preceded with a # symbol. The **usemap** attribute acts as a pointer which indicates that the image is a client side image map.

2. **<map> :** It has only one attribute name. It specifies name of the image used for client side image map. The value of the name attribute is the value specified in usemap attribute of <img>.

3) <area> - It defines specific clickable regions. A given <map> element can contain multiple <area> element within it.<area> is singular tag and <map> is paired.

Attributes of <area>:

Attribute	Description
Href	Defines the URL to which the clickable region within the image-map navigates.
Shape	It can value rect, circle or poly.
coords	Specifies co-ordinates of the clickable regions on the image-map. Rect- specifies rectangular area with four co-ordinates. Circle-Defines a circular region. It requires three co-ordinates. Poly-Defines a polygon region with co-ordinates specifying each point on the polygon. It requires four co-ordinates. Default-Region covers the entire image. No co-ordinates are required
alt	Specifies extra information about clickable area. It is the alternative text to the clickable region.

Example : Image Map with element <map> and <area>

```
<!DOCTYPE HTML>
<html>
<head><title>image map</title>
</head>
<body>
<h1>An example of Image Map
</h1>
<img src="Tulips.jpg"
usemap="#imagemap" alt="Image of
Tulip">
<map name="imagemap">
<area href="http://www.google.com"
shape="rect" coords="0,0,93,65"
alt="google site"/>
<area href=" great_wall_china.html"
shape="circle" coords="118,140 ,40"
alt=" great wall of china"/>
<area href="http://mahahsscboard.
in" shape="poly"coords
="145,187,198,215,245,280,305"
alt="maharashtra stateboard site"/>
</map>
</body></html>
```
(In the above program great_wall_china.html is a local file created on the machine.)

1.10 INLINE FRAME IN HTML5

The <iframe> element creates an inline frame. Inline frames are often used in online advertising, where the contents of the <iframe> is an advertisement from an external party. HTML5 allows the incorporation to be seamless (no scrollbars, borders, margins etc).

Attributes of <iframe> :

Attribute	Values	Description
Src	URL	Specifies the address of the document to embed in the <iframe>
Height	Pixel	Specifies the height of an <iframe>
Width	Pixels	Specifies the width of an <iframe>
Name	Text	Specifies name of an <iframe>
srcdoc	HTML_ code	Specifies the HTML content of the page to show in the <iframe>

For example :

```
<!DOCTYPE html>
<html>
<body>
<h2>HTML Iframes</h2>
<p>This is the example of iframes.</p>
<iframe src="xyz.html" height="200"
width="300"></iframe>
</body>
</html>
```

Output :

```
HTML Iframes

This is the example of iframes.

This page is
displayed in an
iframe
```

1.11 Website Hosting

In this chapter we have seen how to create a website. But just creating of a website is not sufficient. One has to make the website available on the Internet. These web pages are to be stored in the web servers that are connected to the Internet, to be made available to others.

What is web hosting?

Web hosting is the service of providing storage space. The website is made available on the Internet with the help of web hosting.

What is Web Host?

The companies that provides web hosting services are called web hosts. Web hosts own and manage web servers. These web servers offer uninterrupted Internet connectivity.

Types of Web hosting :

Types of web hosting are

1. **Shared hosting :** It is cost effective. It gives domain name to your website.

2. **Free hosting :** There are some hosting websites which provide you free hosting of the website for limited period of time.

3. **Dedicated hosting :** These are paid hosting servers for large websites.

Note : You can buy your own web server space, but it is the most expensive way to publish your website. Though it is very expensive, but it gives you a lot of control over your website.

Prerequisites for Free Web Hosting :

1. Three to Four pages website having first or Home Page named as index. html.
2. Computer with internet connection.
3. Gmail id with password.
4. Need to toggle between two websites https://www.000webhost.com/ and http://my.freenom.com
5. Have to acquire free web space from web server named 000webhost.com.
6. Have to acquire domain name for your website from my.freenom.com.
7. Park the website domain address with free server website i.e. with 000web-host.com.

   Redirect the domain free server name to the domain website i.e. with my. freenom.com.

Steps to Acquire free webspace :

1. Open the website https:// www.000webhost.com/
2. Click on free signup Login with your email id and password
3. verification email will be send to your email
4. open your email and click on "verify email"
5. Click on "Get Started"
6. From My Website page click on "+Create New site" button
7. Type your website name and any password
8. e.g. website name as :- it-xi-textbook
9. From File Manager box select "Up-load" option to upload your web pag-es. Home page of the website must be named as "index.html" (Select all

webpages including image, audio files etc) and click on "Logout"
10. Your website is ready with the sub domain as 000webhostapp.com e.g.it-xi-textbook.000webhostapp. com

Acquire Domain Name :

1. Open the website https://my.freenom. com
2. From Use social sign in Click on "sign in" Login with your gmail id and give password
3. Click on "Services" --> Register a New Domain
4. Type your website name and click on "check availability" button
5. Choose any domain(e.g. .tk,.ml.cg etc) and click on "Get it now" if avail-able click on "CheckOut" button
6. Set the free period to host the website, click on "Continue" button
7. From Review &Checkout page if the Total Due is $0.00 then only select terms and conditions
8. Click on "Complete Order" button e.g. it-xi-textbook.tk
9. From Order Confirmation Screen click on "Click here to go to Client Area" button

Park the website domain :

Go to http://www.000webhost.com website perform the following steps first

1. Select "MyWebsite"--> "Manage Website" -->dashboard-->Tools--> Set Web Address
2. Click on "+Add domain" button then select radio button Park domain and then click on "Next" button

3. Type the site URL acquired by you from Freenom.com e.g. it-xi-textbook. tk. (Remember don't give http or / or any special character)

4. Then click on "Park domain" button.

5. You may see domain status as "pending" for sometime. Once it is through from the 000webhost side you can see the domain status as "parked".

6. Configure your domain's DNS provider to point to the ns01.000webhost.com and ns02.000webhost.com as your nameservers.

Redirect the domain to free server :

Now follow the final steps given below through my.freenom.com website

1. Sign in to my.freenom.com click on "Services"-->

2. "My Domains"-->"Manage Domain"

3. From Domain details screen click on "Management Tools" --> "Nameservers"

4. Change the radio button to "Use custom nameservers (enter below)" and type the NameServer1 as "NS01.000WEBHOST.COM"and NameServer2 as "NS02.000WEBHOST.COM"

5. Click on "Change Nameservers" button

6. Logout from the my.freenom.com

7. Type the website address in the browser's address bar to view your website

8. The website can also be seen from your mobile. Hosting is done.

Summary

- Html5 has introduced new types in <Input> like number, date, Tel, email, search, URL, range, month, week, color.
- Few attributes of <Input> can be used for validation purpose.
- <meta> is used by search engines to search information that is provided with the webpage. It is inserted in the <head>
- CSS- Cascading Style Sheet describes how HTML elements are to be displayed on screen, paper, or in other media.
- CSS syntax Selector{Property1: value1; Property2: value2}
- The <ol> tag defines an ordered list. An ordered list can be numerical or alphabetical.
- An unordered list created using the <ul> tag, and each list item starts with the <li> tag. The list items in unordered lists are marked with bullets (small black circles), by default.
- To insert Audio and Video in a web page, <audio> and <video> are used which specifies the source with the file location.
- An image with multiple hyperlinks is called an image map. The usemap attribute acts as a pointer which indicates that the image is a client side image map.
- The <iframe> element creates an inline frame.

Exercise

Q 1. Fill in the blanks.

1. The………………element is a staring element in an HTML, it indicates that document type definition being used by the document.

2. The……………. is a tag in html that describe some aspects of contents of a webpage.

3. The <ol> tag defines an………………

4. An unordered list created using the…………….. tag

5. The…………………element creates an inline frame.

6. …………….tag is used to specify video on an HTML document.

7. If a web developer wants to add the description to an image he must use ……… attribute of <img> tag.

8. The……………… property is used to set position for an element.

9. The float property defines the………………..of content.

10. ………………is used with elements that overlap with each other.

Q2. State whether the following statement is True or False

1. HTML is an Object Oriented Programming Language.

2. Charset is used for character encoding declaration.

3. An unordered list can be numerical or alphabetical.

4. Multilevel list can be created in HTML 5.

5. Srccode specifies the HTML content of the page to show in the <iframe>

6. The 'controls' attribute is not used to add play, pause, and volume.

7. .cs is the extension of CSS file

Q.3. Choose Single correct answer from the given options.

1. ………………….element used to create a linking image
   a) <img>   b) <td>
   c) <map>   d) <usemap>

2. The ……………tag is used to embed audio files on Webpages.
   a) <sound>   b) <audio>
   c) <video>   d) <embeded>

3. A programmer wants to define range for age between 18 to 50, he will use a form with following appropriate control.

a) number b) compare

c) range d) Textboxes

4. ……….character is used to create id in CSS.

a) % b) $

c) @ d) #

Q 4. Choose Two correct answers from the given options.

1. List within another list either………list or………list is called nested list.

a) multilevel b) order

c) unordered d) general

e) cascading

2. Image maps are of two types ……...........and …………..........

a) Network side

b) Client Side

c) Computer side

d) Server Side

e) n-compting

3. A CSS rule set contains……….. and………………….................

a) Set b) selector

c) post

d) declaration e) block

4. Client-side image map can be created using two elements …………… and………...

a) <area> b) <image>

c) <usemap> d) <map>

e) <server>

Q.5. Choose Three correct answers from the given options.

1. Attributes of <area> tag is……………………..

a) href b) src

c) coords d) data

e) alt f) usemap

2. Attributes used with iframe are………………..

a) srcdoc b) name

c) att d) src

e) href f) loop

3. Following are the Form controls……………

a) email b) search
c) label d) video

e) tel f) audio

4. Attributes used with <audio> tag…………………………..

a) autoplay b) href

c) controls d) cntrl

e) loop f) bgsound

5. CSS types are …………………., ………....... and…………………

a) internal   b) external

c) control   d) inline

e) loop   f) style

6. Positioning types in CSS are……………………

a) Static   b) fixed

c) absolute   d)position

e) dynamic   f) nested

7. Types of floating properties are………,…………,…………..

a) left   b) zero

c) right   d) all

e) none   f) dock

Q. 6. Match the pair

A	B
1)	a) Client side image map
2) usemap	b) CSS Property
3) color	c) bulleted list
4) <Img>	d) Image as a submit button
5) <Input type =image>	e) inserts an image

Q.7. Programs.

1) Write a program using html with following CSS specification-

1. The background colour of the company name should be in green.

2. The text colour of the company name should be red.

3. The heading should be large with font "comic sans ms"

4. The description of the company should be displayed in blue color in a paragraph.

2) Write Html5 code with CSS as follows-

1. To create form to accept name,age, email address, from the user.

2. Create a submit button to send the data.

3. The heading of the form should have a background colour and a different font style.

3) Write Html5 code with CSS as follows-

1. Create ordered list with names of tourist Cities.

2. Create unordered list with tourist places of those cities.

3. Divide the list into two sections left and right by using CSS.

❏❏❏

2 E-Commerce and E-Governance

2.1 Introduction

E-Commerce stands for Electronic Commerce. Before moving to the concept of E-Commerce, let's first, understand what is commerce?

Commerce is an important part of a business. In simple words, commerce is nothing but buying and selling of goods. That means when we buy a product or service from others or sell a product or service to others then it is called as commerce.

One of the most popular activity on the Web is shopping. E-Commerce became possible in 1991 when the Internet was opened to commercial use. Since that date thousands of businesses have taken up residence at websites. History of e-commerce is a history of a new, virtual world which is evolving according to the customer advantage.

2.2 Definition of E-Commerce

"E-Commerce can be broadly defined as the process of buying and selling of goods or services using an electronic medium such as Internet."

E-commerce is also referred as a paperless exchange of business information using EDI, E-mail, Electronic fund transfer etc.

Difference between Traditional Commerce and E-Commerce :

Traditional Commerce	E-commerce
Traditional commerce focuses on the exchange of products and services through personal interactions so it is manual.	E-commerce trading activities are online via the internet and can be considered automatic.
Traditional commerce is limited to business hours, mostly during the day.	E-commerce is 24X7, it can be done anytime day and night.
As far as consumer interactions are concerned, traditional commerce provides face to face interaction.	E-commerce can be termed as screen to face interaction.
Traditional commerce is limited to a particular geographical location.	E-commerce is global and has no physical limitation.
Modes of payment in traditional commerce include cash, cheques and credit cards.	In E-commerce modes of payments are bank transfer, credit card, e-wallet, mobile payment and many more.
Goods and delivery of services is instant with traditional commerce.	In E-commerce delivery of goods or services takes some time.
Traditional Commerce's scope is local.	E-commerce's scope is global.

Advantages of E-Commerce :

- **Global scope :** E-commerce provides the sellers with a global reach. Now sellers and buyers can meet in the virtual world, without barrier of place (geography).

- **Electronic transaction :** E-commerce reduces the paper work and significantly lower the transaction cost. E-Commerce enables the use of credit cards, debit cards, smart cards, electronic fund transfer via bank's website and other modes of electronic payment.

- **Cost Saving :** E-commerce application provides users with more options to compare and select the cheaper and better option. It helps in reducing the cost of searching a product. E-commerce has enabled rural areas to access services and products, which are otherwise not available to them.

- **Anytime shopping :** One other great advantage is the convenience. A customer can shop 24×7. The website is functional at all times, it does not have working hours like a shop.

- **No intermediaries :** Electronic commerce also allows the customer and the business to be in touch directly, without any intermediaries. This allows for quick communication and transactions.

- **Public services :** E-commerce helps the government to deliver public

services such as healthcare, education, social services at a reduced cost and in an improved manner.

Disadvantages of E-Commerce :

- **Setup Cost :** The setup of the hardware and the software, the training cost of employees, the constant maintenance and upkeep are all quite expensive.

- **Physical presence :** This lack of a personal touch can be a disadvantage for many types of services and products like interior designing or the jewellery business.

- **Security :** Security is another area of concern. Credit card theft, identity theft etc. remain big concerns with the customers.

- **Goods Delivery :** There may arrive some problem with fulfilment of order. Even after the order is placed there can be problems with shipping, delivery, mix-ups etc. This leaves the customers unhappy and dissatisfied.

Types of E-Commerce :

The most common participants in e-Commerce are business, administration, government and consumer. The primary e-Commerce types are as follows:

- **Business - to - Consumer (B2C) :** In B2C model, business sells it's products directly to a customer. A customer can view the products shown on the website. The customer can choose a product and order the same. The website will then send a notification to the business organization via email and the organization will dispatch the product/goods to the customer. These B2C businesses are online retailers. Example : Amazon, Flipkart etc.

- **Business - to - Business (B2B) :** In B2B model, business sells it's products to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the product to the final customer who comes to buy the product at one of its retail outlets. Example : Tata communications (network provider).

- **Consumer - to - Consumer (C2C) :** In C2C model, consumer helps

consumer to sell their assets like residential property, cars, motorcycles etc., or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Example OLX, Quikr, online auction.
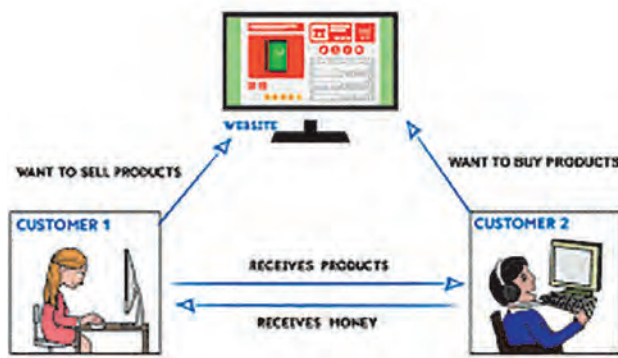

- **Consumer - to - Business (C2B) :** In this model, consumers have products or services of value that can be consumed by businesses. For example, the comparison of interest rates of personal loan/car loan provided by various banks via websites. A business organization who fulfills the consumer's requirement within the specified budget, approaches the customer and provides its services. For e.g. - A blog can be written by an author for a business to improve sale of products, ebay.

2.3 E-Commerce Trade Cycle

A trade cycle is the series of exchanges, between a customer and supplier that take place when a commercial exchange is executed. A general trade cycle consists of following phases:

- **Pre-Sales :** It consist of two steps like Search and Negotiate. Customer search for required website for product to be purchased. In Negotiate step customer find a supplier who offers good quality product at cheaper price and then customer agrees the terms forwarded by supplier.

- **Execution :** This phase consist of Order and Delivery. Customer sends an order for the selected product and after processing the order, customer receives delivery of the product.

- **Settlement :** This phase consist of Invoice (if any) and Payment. Invoice means customer will receive a bill for purchased product and after confirmation of received product, customer will pay for the same.

- **After-Sales :** This phase consists of warranty and After Sale Services. In warranty period, customer will get all maintenance services for free or at minimum cost. After sale services means customer will do complaints (if any) about the performance of product and get maintenance service from the supplier.
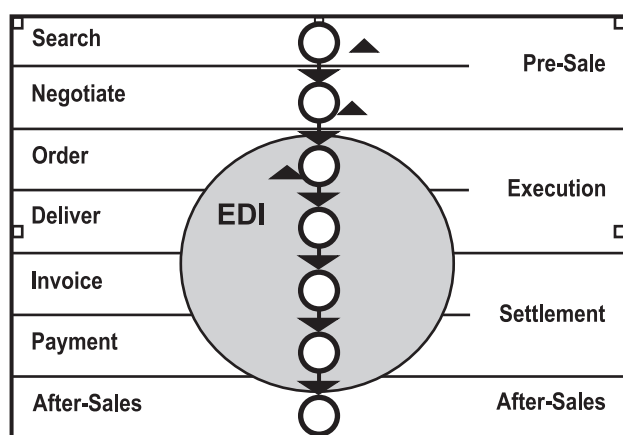
Trade Cycle

2.4 Modes of Payment

1. **Credit Cards** : Credit cards are the most common way for customers to pay online. Merchants can reach out to an international market with credit cards, by integrating a payment gate-way into their business.

2. **Mobile Payments :** Mobile payments offer a quick solution for customers to purchase on e-commerce websites. Mobile payments are also commonly used on donation portals, browser games and social media networks such as dating sites where customer can pay by scanning a barcode on an app on mobile. Examples are apps like BHIM, UPI, Paytm, Google Pay, Paypal,..etc.

3. **Bank Transfers :** Bank transfer is used when money is sent from one bank account to another. Transferring money from bank account is usually fast and safer than withdrawing and paying in cash because every transaction will be authenticated by checking customer's banking credentials. Example : NEFT, IMPS etc.

4. **E-wallets :** E-wallet is a type of electronic card which is used for transactions made online through a computer or a smartphone. E-wallet is a type of pre-paid account in which a user can store money for any future online transaction. An E-wallet is protected with a password. Examples are State Bank Buddy, Paytm Wallets...

Do it yourself

Find out some more payment modes used in E-Commerce.

2.5 Forms of E-Commerce

Some common forms of E-Commerce are as follows.

- **M-commerce (Mobile commerce) :** M-Commerce is the buying and selling of goods and services through wireless handheld devices such as smartphones and tablets. As a form of e-commerce, m-commerce enables users to access online shopping platforms without needing to use a desktop computer. Some of application of M-Commerce are mobile banking, ticket booking, E-bill payment, online auctions, stock market trading.

- **Social Commerce :** Social commerce is a form of electronic commerce that involves social media, online media that supports social interaction. It enable shoppers to get advice from trusted individuals, find goods and services and then purchase them. The social networks that spread this advice have been found to increase the customer's trust in one retailer over another. Social commerce is the use of networking websites such as Facebook, Instagram and Twitter as vehicles to promote and sell products and services. The success of a social commerce campaign is measured by the degree to which consumers interact with the company's marketing through retweets, likes and shares.

2.6 E-Commerce Technology

Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems and automated data collection systems. Let's see one of the common E-commerce technology i.e EDI.

Electronic Data Interchange (EDI) : EDI is the electronic interchange of business information using a standardized format; a process which allows one company to send information to another company electronically rather than on paper. Business entities conducting business electronically are called trading partners. Many business documents can be exchanged using EDI, two most common documents are purchase orders and invoices. It is computer-to-computer interchange of strictly formatted documents via telecommunications or physically transported on electronic storage media.

2.7 E-Governance

It signifies the implementation of information technology in the government processes and functions so as to cause simple, moral, accountable and transparent governance. The basic purpose of e-governance is to simplify

processes for all, i.e. government, citizens, businesses etc. at National, State and local levels. Hence, E-governance delivers SMART government. (S- Simple, M-Moral, A-Accessible, R-Responsive, T-Transparent Government)

Advantages of E-governance :

➢ Reduced corruption

➢ High transparency

➢ Increased convenience

➢ Direct participation of constituents

➢ Reduction in overall cost.

➢ Expanded reach of government

Types of E-Governance :

E-Governance is of 4 types depending on the specific types of services.

E-Governance

1. Government-to-Citizen (G2C)

The Government-to-citizen refers to the government services which enable citizens to get access to wide variety of public services. Most of the government services fall under G2C. It helps the ordinary people to reduce the time and cost to conduct a transaction. A citizen can have access to the services anytime from anywhere. Furthermore, Many services like license renewals and paying tax are essential in G2C. It also focuses on geographic land barriers.

2. Government-to-Business (G2B)

The Government to business is the exchange of services between Government and Business organizations. G2B provides access to relevant forms needed to comply. The G2B also consists of many services exchanged between business sectors and government. It aims at eliminating paper work, saving time, cost and establish transparency in the business environment, while interacting with government.

3. Government-to-Government (G2G)

The Government-to-Government refers to the interaction between different government departments, organizations and agencies. In G2G, government agencies can share the same database using online communication. The government departments can work together. In conclusion, G2G services can be at the local level or the international level. Likewise, it provides safe and secure inter-relationship between domestic or foreign government.

4. Government-to-Employee (G2E)

The Government-to-Employee is the internal part of G2G sector. Furthermore, G2E aims to bring employees together and improvise

knowledge sharing. Similarly, G2E provides online facilities to the employees like applying for leave, reviewing salary payment record and checking the balance of holiday. The G2E sector provides human resource training and development. So, G2E is also the relationship between employees, government institutions and their management.

Some effective examples of successful implementation of E-Governance projects are e-Mitra project (Rajasthan), e-Seva project (Andhra Pradesh), CET (Common Entrance Test) .

Do you know?

Digital India *is a campaign launched by the Government of India in order to make Government's services available to citizens electronically. Digital India was launched by the Prime Minister of India Narendra Modi on 1 July 2015 with an objective of connecting rural areas with high-speed Internet networks and improving digital literacy.*

Some of the facilities provided through this initiative are Bharat net, digital locker, e-education, e-health, e-sign, e-shopping and national scholarship portal.

UMANG (Unified Mobile Application for New-age Governance) Mobile App: It is a Government's all-in-one single unified secure multi-platform, multi-lingual, multi-service freeware mobile app for accessing over 1,200 central and state government services through smart phones, feature phones, tablets

and desktops. It include services like AADHAAR card, DigiLocker, Bharat Bill Payment System, PAN, EPFO services, PMKVY services, AICTE, CBSE. It also provides utilities like bills payments, education, job search, tax, business, health, agriculture, travel, Indian railway tickets bookings, birth certificates, e-District, e-Panchayat, police clearance, passport, other utility services from private companies and much more.

2.8 Security Measures in E-Commerce

E-Commerce security refers to the principles which guide safe electronic transactions, allowing the buying and selling of goods and services through the Internet.

A) **Encryption :** Encryption is widely used on the internet to protect user information being sent between a browser and a server. This includes passwords, payment information and other personal information that should be considered private. The process consists of two processes as encryption and decryption. Encryption converts Plain text (readable form of data) into Cipher Text (coded form of data) means non-readable form of data. Decryption is exactly opposite process of encryption. It converts Cipher text into Plain text.

Encryption is of two types-

1. Symmetric
   (Shared Secret Encryption)

2. Asymmetric
   (Public-Key Encryption)

Encryption	Decryption
Plain text ⟶ cipher text ⟶ Plain text	
(readable form of data) (coded form of data) (readable form of data)	
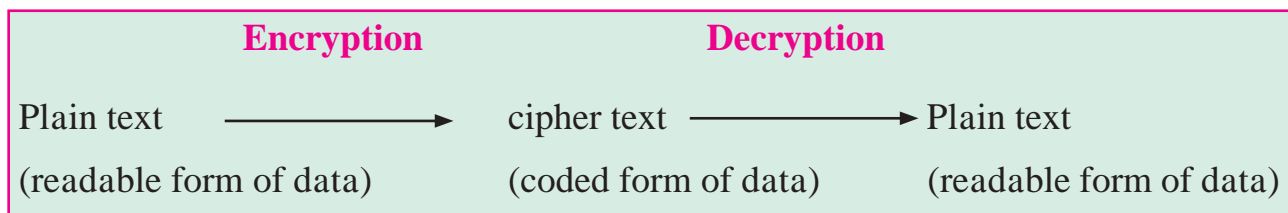
B) Digital Signature : A digital signature is also known as an electronic signature. A digital signature guarantees the authenticity of an electronic document or message in digital communication and uses encryption technique (asymmetric cryptography) to provide proof of original and unmodified documentation. Digital signatures are used in e-commerce, software distribution, financial transactions. This is the direct transfer of information between two partners.

C) Digital Certificate : A Digital Certificate is an electronic "password" that allows a person, organization to exchange data securely over the Internet using the public key infrastructure (PKI). Digital Certificate is also known as a public key certificate or identity certificate. In this information is transferred between two authorized partners who have digital certificates issued by some supreme authority.

Signed and all signatures are valid.　　　　　　　　　　Signature Panel

Sample Signed PDF Document

Digitally signed by John B Harris
DN: c=US, st=CA, I=San Jose,
o=Adobe Systems Incorporated,
cn=John B Harris,
email=jbharris@adobe.com
Reason: I am the author of this document
Date: 2009.07.16 10:47:47 -04'00'

Do it yourself

Visit Maharashtra Government website, view various Government Resolutions (GR) and observe the digital signature of various authorities.

Summary

- Buying and selling of goods or services on internet is called as E-Commerce.

- Common types of E-Commerce are B2C, B2B, C2C and C2B.

- When any business transaction takes place, it completes one trade cycle. Trade cycle consist of phases like presale, execution, settlement and after sale etc.

- In E-Commerce commonly used payment modes are credit card, mobile payment, bank transfer, e-wallet etc.

- Some common forms of E-Commerce are M-Commerce, social commerce.

- Electronic Data Interchange (EDI) is one of the most important technology for paperless exchange of information.

- E-Governance is the implementation of information technology in the government processes and functions.

- Types of E-Governance are G2C, G2B, G2G and G2E.

- In E-Commerce confidential information can be protected by using encryption, digital signature and digital certificate.

Exercise

Q.1 Fill in the blanks.

1. E-Commerce's scope is ……………

2. A customer can do shopping …………..online using type of E-Commerce.

3. The…………… phase consist of Order and Delivery.

4. E-wallet is a type of ………… account in which a user can store his/her money for any future online transaction.

5. EDI is ……………………… exchange of information.

6. The ……. type of e-governance refers to the government services which enable citizens to get access to wide variety of public services.

7. The e-governance which provides safe and secure inter-relationship between domestic or foreign government is ………..

Q.2 State True/False.

1. C2C type of E-commerce deals with Business and Customer.

2. The lack of a personal touch can be a disadvantage for many types of services and products in E-commerce.

3. Checking the balance of holiday is an example of G2C.

4. E-commerce provides more options to compare and select the cheaper and better options.

5. M-commerce can be used through desktop computer.

Q.3 Multiple Choice Question. (1 correct answer)

1. Invoice and payment are included in ……………phase of trade cycle.
   a) Presale   b) execution
   c) settlement   d) After sale

2. License renewal is an example of ………….. e-governance.
   a) G2C   b) G2B
   c) G2G   d) G2E

Q.4 Multiple Choice Question. (2 correct answer)

1. Encryption consist of two processes………………….and ……………..................
   a) encryption   b) signature
   c) decryption   d) digitization
   e) security

2. Social commerce is a subset of electronic commerce that involves social media like … … … … … … & ……………………..
   a) Facebook   b) Instagram
   c) gmail   d) whatsapp
   e) software

Q.5 1) Match the following.

A	B
1. M-commerce	a) Coded form of data
2. Cipher Text	b) B2B
3. EDI	c) E-bill payment
4. Wholesaler-to	d) Paperless exchange of information
5. License renewal services	e) G2G
6. Online facility to employees like leave	f) G2C
7. Government agencies share same database	g) G2E

Q.6 Answer in brief.

1. Explain phases of trade cycle.

2. Explain M-Commerce.

3. Describe process of encryption.

4. What is E-governance.

5. List out advantages of E-commerce.

6. Which are the different types of e-governance?

7. State two examples of G2E services.

8. Write any four advantages of e-governance.

❑❑❑

3 Basics of Audio and Video Editing

3.1. Introduction

Audio editing is a process to edit, shorten, or shift a piece of music or spoken audio, increase or decrease speed and volume or to create loop of certain portion of audio. Goal is to make it ideal for listening more pleasurable.

Audio editing is a vast field. Following are some of the areas of audio editing :

- Radio Technician
- Sound Engineer
- DJ, Music Producer
- Film/Television Sound Recording
- Field Sound Engineer etc.

There are various audio editing softwares that provide different types of functionalists and support various operations.

Some of the examples of the free and open-source audio editing software are Audacity, Traverso DAW, Ardour, Mixxx, Qtractor and various other commercial Software are also available.

We are using Audacity software in this chapter to demonstrate audio editing operations.

3.2 Introduction about Audacity

Roger B. Dannenberg, Professor of Computer Science, Art & Music at Carnegie Mellon University, started the research project Audacity, along with his graduate student Dominic Mazzoni. Today Audacity is one of the best audio editing software. Since it is Free and Open-Source Software, the source code of the Software is available to all. This open nature motivates people to donate their time to fix bugs and make extensions.

Features of Audacity

Audacity allows you to record, export and import various sound file formats, and it has multiple plug-ins which enable us to extend the functionality of Audacity. We can apply lots of effects to sound and even generate and mix sounds.

Applications of audio editing skills

- Audio/Radio advertisement
- Documentary films need audio editing to synchronize with the video
- Creating Podcasts
- Recording speeches
- Creating sound stories
- Record sound for slides presentations
- Editing or compiling songs together

Do it yourself

Install any Open Source mobile podcast app such as AntennaPod.

3.3 Activities in audio editing :

Let`s see some of the activities involved in the audio editing

- Remove unwanted sound like breaths, cough, ringing of the phone etc.
- Remove repeated dialogues.
- Add music to the beginning or at the end of video clips.
- Stretch/shorten audio and sound effects according to the length of the visual.
- Slice together audio recorded at different sittings.
- Sync up different musical instruments so that they all can sound on the beat.
- Loop, slice and edit beats.

Recording a good quality audio is an art. Some of the tips to record a good quality sound are as follows-

1. A good quality external microphone will give us an excellent quality of sound

2. How we place our microphone while recording, affects the sound quality. It must be steady and fixed at some position while recording the audio.

3. Recording 10 seconds of silence, in the beginning, will give us room ambient noise input. This recorded silence then can be used later on in the audio editing software to remove the noise from the entire audio clip.

4. Recorded audio quality must be listened using headphones to get the precise sound. We can also use studio monitor speakers for professional audio productions.

5. Ensure to get the minimum or zero ambient noise.

Do it yourself

Install Audacity on your computer
To install on Ubuntu using the terminal
$ sudo apt install audacity
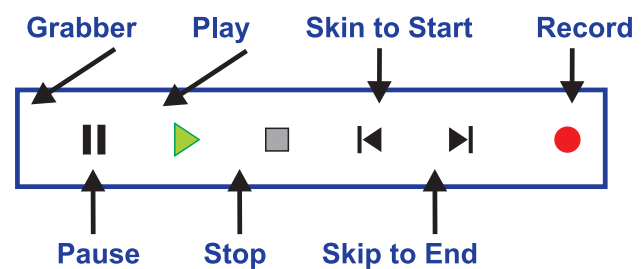
Fig. 3.1 : Recording Panel

Note : You may need to select the default recording and playback devices for your system. You can select devices from , Edit → Preferences → Devices

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To start recording an audio :

1. Click on the Record Button in the Control Tool bar, as shown in the previous figure 3.1.

2. Start your speech or message.

3. Press the Pause Button in the Control Tool bar if you wish to pause your recording at any point press it again to resume recording.

4. Press the Stop Button in the Control Tool bar when you have finished your recording.

To listen to your recording :

1. Click on the Play Button in the Control Tool bar as shown in figure 3.1.

2. Click on the Stop Button or Pause Button in the Control Tool bar to stop or pause the playback.

3. We can adjust the volume (at which you listen to our recording) using the Playback Volume slider in the Mixer Tool bar.

3.4 Import Audio Files into Audacity

First launch Audacity, then import an audio file by selecting File → Import →Audio (Ctrl + Shift + I) Audacity can import many common audio file formats, including WAV, AIFF, and MP3.

If the optional FFmpeg library is installed, a larger range of formats, including WMA and the audio content of most video files, can be imported.

A quicker method is to just drag and drop the file.
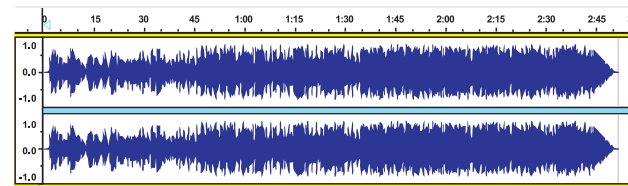
Fig. 3.2 : Stereo Waveform

Figure 3.2 shows a stereo waveform. The left channel is displayed in the top half of the track and the right channel in the bottom half. The height of the wave indicates the sound level.

3.5 Export audio clips to various formats

Audacity allows us to export your edited work into various following formats AIFF, WAV 16 and 32 bit, Mp3 files, Ogg files etc. We can set following various quality parameters as shown in following figure.
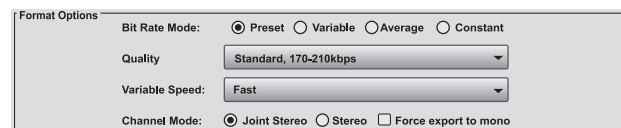
Fig. 3.3 : Export Audio Options

A) Bit Rate Mode

1. **Preset :** It contains settings recommended by the developers for exporting audio files.

   - **Insane :** It is the best possible encoding quality. This preset has a constant bit-rate of 320 kbps, which is equivalent to 2.4 MB per minute

   - **Extreme :** Extremely high quality.

   - **Standard :** Very good quality encoding.

   - **Medium :** Good sound quality suitable for casual listening or portable devices.

2. **Variable :** This mode continuously varies the bit rate used according to the complexity of the sound, in an attempt to maintain the quality of the recording at a consistent level.

3. **Constant :** This sets a constant bit rate for the encoding, regardless of its complexity. Among the four bit rate modes, this usually gives the worst, least consistent quality for a given file size, but that size itself is completely predictable.

4. **Average :** It sets a known, average bit rate for the file, but within this average permits some fluctuations in bit rate to reflect the relative difficulty of encoding the file.

B) Quality

This list allows us to select the bit rate in kbps (kilobits per second) for encoding your file. A higher bit rate always gives better quality but at the expense of a larger file size and vice versa.

Variable Speed, Choice of speed is available when using variable bit rate encoding. It determines the speed and bit allocation routines of the encoding algorithm.

C) Channel Mode

These controls determine how two channels of a stereo MP3 are encoded or if exported, MP3 should always be **mono**.

In monaural sound one single channel is used. It can be reproduced through several speakers, but all speakers are still reproducing the same copy of the signal.
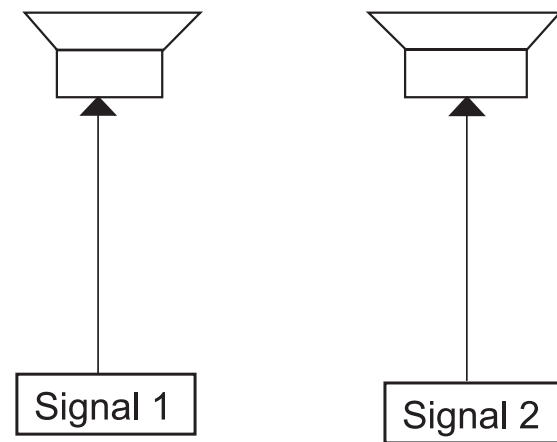
Fig. 3.4 : Monaural Sound

In stereophonic sound more channels are used (typically two). We can use two different channels and make one channel feed one speaker and the second channel feed a second speaker (which is the most common stereo setup). This is used to create directionality, perspective and space.
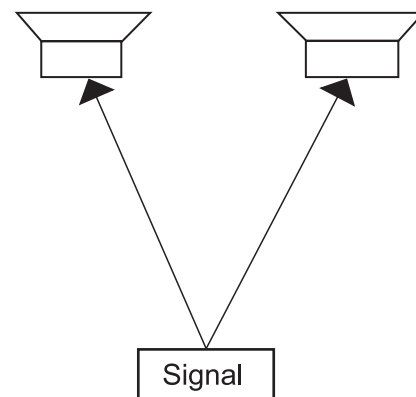
Fig. 3.5 : Stereophonic Sound

Once we set the parameters for exporting the audio we will be prompted to edit the meta data tags which will be nothing but the information associated with the audio files being exported. This information will be useful in the audio or music player.

Export to Multiple (Ctrl + Shift + L) allows us to do multiple exports from

Audacity with one command.

Export either multiple files based on the multiple tracks in the project, or based on the labels in a single audio track. A great time saver for splitting up long recordings into separate CD tracks, or archiving multiple working tracks.

Edit Metadata Tags	×

Use arrow keys (Or Enter key after editing) to navigate fields.

Tag	Value
Artist Name	
Track Title	
Album Title	
Track number	
Year	
Genre	
Comments	

Add   Remove   Clear

Genres
Edit....   Reset...

Template
Load....   Save....   Set Default

Cancel   Ok

Fig. 3.6 : Audio file meta tags

Do it yourself

1. Record an interview of a person in any field, prepare questions suppose to ask. Select Audio recording tools like Ex. Microphone, Mobile Phone, record using audacity on your computer.

2. Export audio into various formats with different parameters set and find out the differences in the audio quality.

3.6 Editing an Existing Audio File

We will import an existing sound file, remove at least 10 seconds of this file, apply a 1-second fade-out at the end, export the results, and play it.

Steps to editing :

1. Keep ready audio file to edit.

2. Launch Audacity, then import an audio file by selecting File ⟶ Import ⟶ Audio.

3. We will get the waveform in the main window. If the audio is a stereo waveform, then the left channel is displayed in the top shows half of the track and the right channel in the bottom, half of the track.

4. Listen to the imported audio.

Using Keyboard for selection :

- You can select audio entirely using the left arrow, right arrow and other keys.

- Press Left or Right to move the cursor left or right respectively in the waveform.

- Hold down Shift while pressing Left or Right to create then extend a selection leftwards or rightwards respectively.

- Hold down Shift and Ctrl while pressing Left or Right to contract an existing selection leftwards or rightwards respectively.

We edit audio waveforms in Audacity in the same way as we would edit text in a word-processing document. When we are editing text we first select the text, we want to change and then choose operations we want to do with it. We might want to cut or copy the text, delete it, paste new text in its place, or change it to bold. We

do the same thing in Audacity: first zoom and select the range of audio we want to change, and then choose what we want to do with it.

The above image shows Edit Toolbar with the Zoom buttons highlighted. These are Zoom In tool, and Zoom Out tool.

Once we select the audio for some duration we can press delete or use the cut tool.

- Click on File → Export → Export Audio - the standard "Save" dialog for our operating system appears.

- Give the file a different name. Audacity always suggests a name for the file that is the same as the name of our Audacity project. It is always best to alter this so we do not confuse your exported file with our Audacity project.

- Choose a location to save the file in the usual manner.

- At the bottom of the Save dialog is a dropdown menu labeled "Format". From this menu choose "WAV (Microsoft) signed 16-bit PCM".

- There are no options for the WAV file format, so there is no need to click the Options button.

- Click the Save button to complete the export of our project to a WAV file.

- To zoom in to get a closer look at the waveform, first choose the Selection Tool IBeam.png, then click near the point we are interested in, then click the Zoom In button.

- If we make a mistake, we can always click on Edit →Undo. Audacity has unlimited Undo and Redo. We can undo our editing actions all the way back to when we imported the file. We can also Redo actions that we have undone.

3.7 Removing noise from the audio recording.

1. Select the "silent" section of our audio, where it's just a noise.

2. Go to the Effects menu and click Noise Removal.

3. Click Get Noise Profile.

4. Select all of the audio from which we want that background noise to be removed.

5. Go to the Effects menu and click Noise Removal as shown in the figure 3.7.
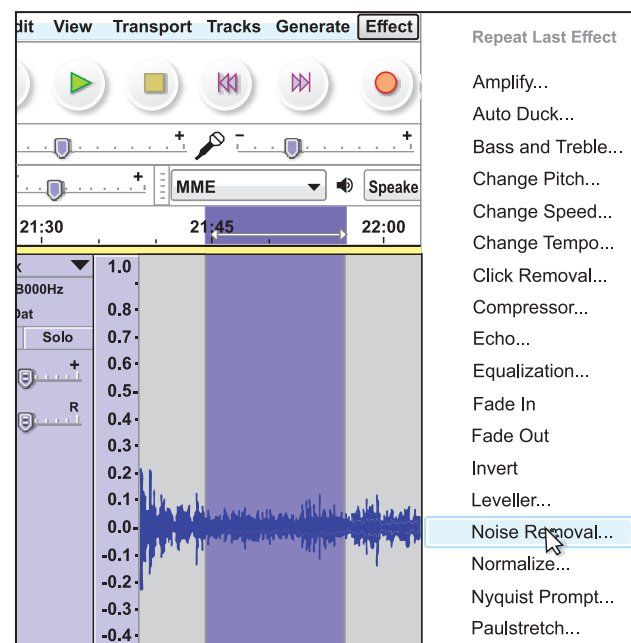
Fig. 3.7 : Sound Effects

6. Adjust the settings if necessary (defaults are fine) and click OK.

7. Listen to ensure our audio doesn't sound like it's underwater.
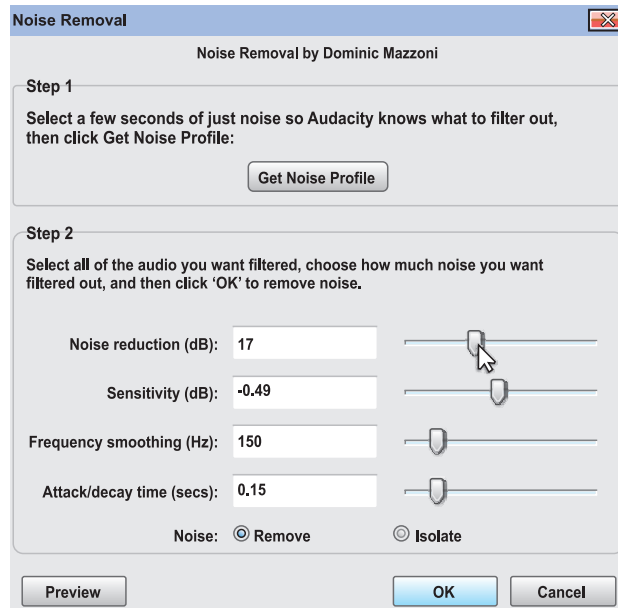
Fig. 3.8 : Noise Removal Options

3.8 Effects, Generators and Analyzers :

- An Effect changes the audio in some way like artificially created or enhanced sound

- A Generator creates new audio, either in an existing track or in a new track.

- An Analyze tool performs analysis on a selection of audio - it does not change the audio and does not create new audio.

You can use the following operations on the audio using various effects-

- Make the sound louder or quieter, which is also called as increasing or decreasing gain of sound.

- Fade a section in or out.

- Change the quality of the sound.

- Repair damaged audio.

- To make the sound play faster, slower, lower pitched or higher pitched.

- Add reverberation or echo.

- Remove vocals.

- Manipulate Audio.

In order to apply effect to the portion of sound, select it and apply the filter with its settings.

Some of the useful effects which we can use are as follows-

1. **Amplify :** Increases or decreases the volume of the audio we have selected.

2. **Normalize :** Use the Normalize effect to set the maximum amplitude of a track, equalize the amplitudes of the left and right channels of a stereo track and optionally remove any DC offset from the track.

3. **Fade In :** Applies a linear fade-in to the selected audio.

4. **Fade Out :** Applies a linear fade-out to the selected audio.

5. **Bass and Treble :** Increases or decreases the lower frequencies and higher frequencies of your audio independently; behaves just like the bass and treble controls on a stereo system.

6. **Equalization :** Adjusts the volume levels of particular frequencies like treble/bass.

7. **Noise Reduction :** This effect is ideal

for reducing constant background noise such as fans, tape noise, or hums. It will not work very well for removing talking or music in the background.

8. **Change Pitch :** Change the pitch of a selection without changing its tempo.

9. **Change Speed :** Change the speed of a selection, also changing its pitch.

10. **Echo :** You can make sound like echo. Echo is a reflection of sound that arrives at the listener with a delay after the direct sound.

Do it yourself

Demonstrate various effects using an audio clip, export all audio files with all these various effects applied.

3.9 Video Editing

Video editing is the process of manipulating raw videos, clips, images, sounds to create a new movie or new video.

Videos editing includes the following activities-

- Rearranging, adding and removing sections of video clips or audio clips.

- Applying colour correction, filters and other enhancements.

- Creating transitions between clips.

- Removing unwanted footage or part of the video, or selecting the best shot.

- Creating flow in the story with a sequence of the video shots and music and narration.

- Add effects, graphics, music, etc.

- Change the style, pace or add effects to the video.

- Adding titles in the video.

A video editing software allows us to do all the tasks mentioned above easily. It is used in the post production for video production. For the demonstration of all video editing activities, we will be using Kdenlive video editor.

Different Types of Video Editing

There are three types of editing video techniques as follows.

1. **Linear Editing :** This is an old technique and now it is not being used. This technique uses several video tapes in sequence and a single new video will be created.

2. **Non-Linear :** Non-linear editing enables direct access to any video frame in a digital video clip, without having to play or go through adjacent footage to reach it. In this technique, all the videos are arranged in a timeline using computer software like Kdenlive and you can edit any part of the video. **Non- Linear editing** is also called as Non-destructive editing. It is a form of audio, video and image editing in which the original content is not modified in the course of editing.

3. **Live Editing :** Multiple camera input is given to the mixer and then the live coverage of an event like sports

broadcasts are provided here editing happens in real time.

In this chapter we will be learning Non-linear / Non-destructive editing.

Video Editing Basics

In this section, we will study some of the basic terms which beginners must know while doing performing video editing.

- **Video Import :** Refers to the loading of a video captured from digital camera to the computer.

- **Video footage :** Its a raw material of video imported from camera on which video editor will work.

- **Stock Footage :** It is also referred to as archieve footage, library pictures and file footage, used as template files.

- **Cut :** It is an instant change from one shot to the another. Example like we are watching one scene and immediately switched to another scene.

- **Jump Cut / Cut in :** It is a cut between the shots where the angle, position is same. Example, when a person is walking, instead of showing entire duration, **jump cut** is used to save time and also give impression that person has walked the entire distance.

- **Cutaway :** Within a sequence of scenes we put another shot, **cutaway** is used to show parallel actions.

- **Video Frame :** Frame is made up of the complete image, let's say for a

film we have 24 frames per second

- **Frame rate** is the frequency at which consecutive images called frames appear on a display.

- **Transition :** It is a change from one shot to the another we can use transitions like, dissolve where first shot gradually disappear and next become more visible.

Video Recording Principles :

You may need to know some of the basics of the video recording; these are very useful to keep your videos consistent and straight forward.

Principle no 1 : Do not cross 180 degree line. The 180-degree line describes the position of the camera and the object which you are shooting. You, as a videographer, must position the camera on one side only. Changing the line will change the position of the object in the video, and the audience may get confused. In order to avoid this we can have multiple camera input.
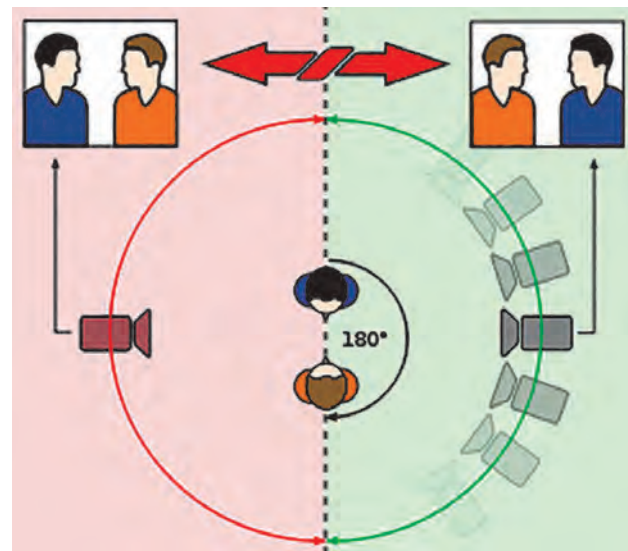
Fig. 3.9: Effect of crossing camera 180⁰

Principle no 2 : Join your videos in sequence and edit in the sequence. You must have a logical or ideal sequence of all the videos which you are editing, having a complete sequence will only give meaning to the entire video. Another sequence which matters is direction, movement, position, and even audio.

Pudovkin's five principles of editing

Pudovkin's techniques can be used in video editing to enhance the viewer's understanding of a story and to create a specific reaction from the audience.

1. **Contrast :** It is the cutting between two different scenarios to highlight the difference between them.

2. **Parallelism :** In this we can connect two seemingly unrelated scenes by cutting between them and focusing on parallel features.

3. **Symbolism :** In symbolism we move from our main scene to something which creates a symbolic connection for the audience.

4. **Simultaneity :** It is the cutting between two simultaneous events as a way of driving up the suspense.

5. **Leit motif :** The **'reiteration of the theme'** involves repeating a shot or a sequence at crucial moments as a sort of code.

Do it yourself

Search for videos demonstrating Pudovkins principles.

3.10 Video Editing with Kdenlive

Kdenlive (KDe Non Linear Video Editor) is a free and open-source video editing software. Jason Wood started the Kdenlive project in 2002.

Using Kdenlive, you can make professional-quality videos it also gives you complete control over all aspects of video editing.

Kdenlive is readily available in the repositories of all popular Linux distributions and also for other desktop operating systems.

Features of Kdenlive :

- Free and Open-source video editor, Uses Qt and the KDE Frameworks libraries.

- Multi-track video editing to use and arrange several audio and video tracks.

- Multiple audio/video format, almost all formats are supported.

- Highly configurable interface to fit your workflow.

- Title for the videos can be created with inbuilt title editor.

- Quickly create slide shows from Pictures or Images using various transitions.

- Lots of effects and transitions.

To install kdenlive in Ubuntu 18.04, you can use the following command in the terminal or use Ubuntu software center

$ sudo apt install kdenlive

Start and Save Project

Launch the Kdenlive application, Click on the 'File' and 'New' to start a new project (Ctrl + N).

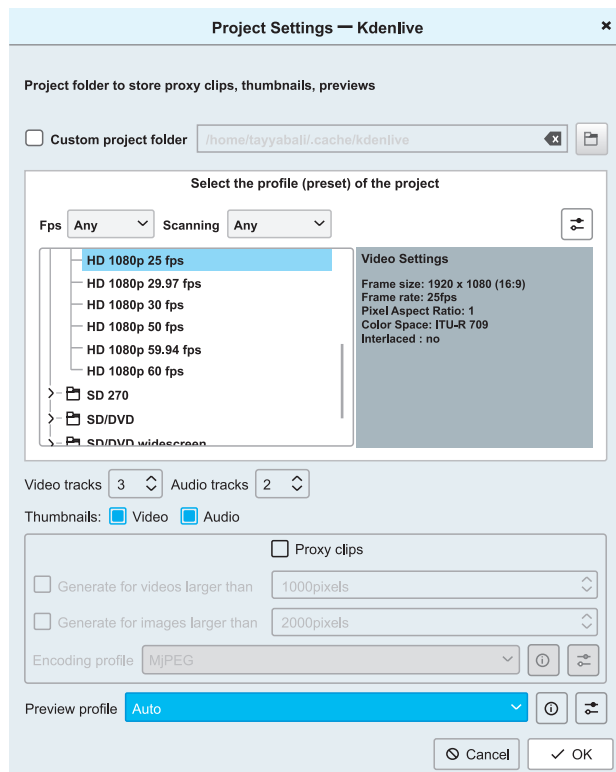When we start the project following window will appear.

Fig. 3.10: Project Setting window

From these windows, we have to select:

- Where the project will be saved.

- Video quality setting, by default HD 1080p 25 fps can be selected.

- You can choose how many video and audio tracks you need, this can be changed later also.

- Proxy clips setting which is used to

improve the rendering and preview performance.

- Better the quality and fps (frames per second) more the slower rendering, Click OK with all the default settings; we will get the following environment.

3.11 Kdenlive User Interface

1. **Project Bin :** This is called project bin, here we can import all your audios, videos, images and titles which we want to include in the Project. We can even drag and drop files in this area.

2. **Properties Windows :** This window displays the properties effects and transitions which you can change and properties of the selected file from the timeline or project bin

3. **Transition and Effects :** Using it we can choose the transitions and various effects for the videos.

4. **Video preview window :** Here the preview of the video will be shown.

5. **Time Line :** This is the most significant part of the user interface, here you will keep all your videos, audios and pictures. It is also chronological display of an edited sequence in a non-linear editing system.

Now we know the basics of Kdenlive interface. In the next section let`s create the slide show video using the images.
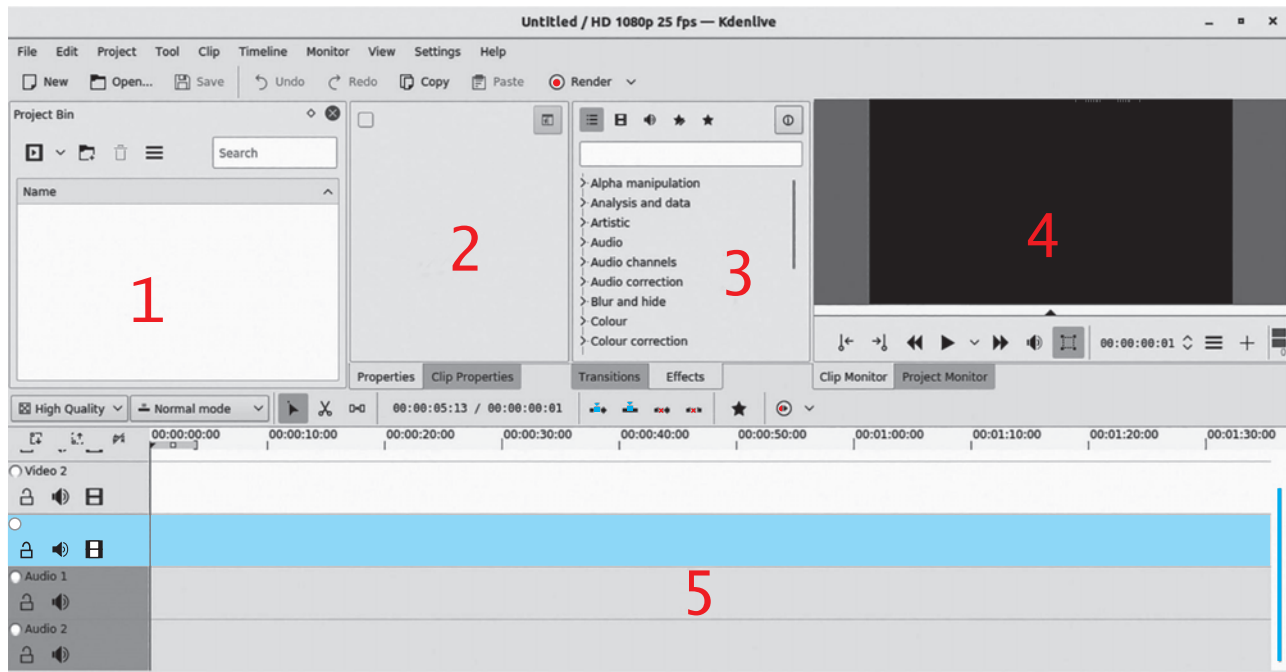
Fig. 3.11 : Kdenlive User Interface

3.12 Slideshow Clip Activity

In this activity, we will learn to make a slide show and render the video, we often need to create a video using pictures with the background music and pictures transitions. In Kdenlive it is called as a **slideshow**.

Steps to create a slide show :

Step 1 : Be ready with pictures for your slide show.

Step 2 : We will also need suitable background audio for our slide show.

Step 3 : Create a new project and from the project bin window, click the little arrow to add Slide Show clip as shown in the figure below, then from the same arrow of the bin, select the Add clip option.

- Select the directory from where we want to select the images.
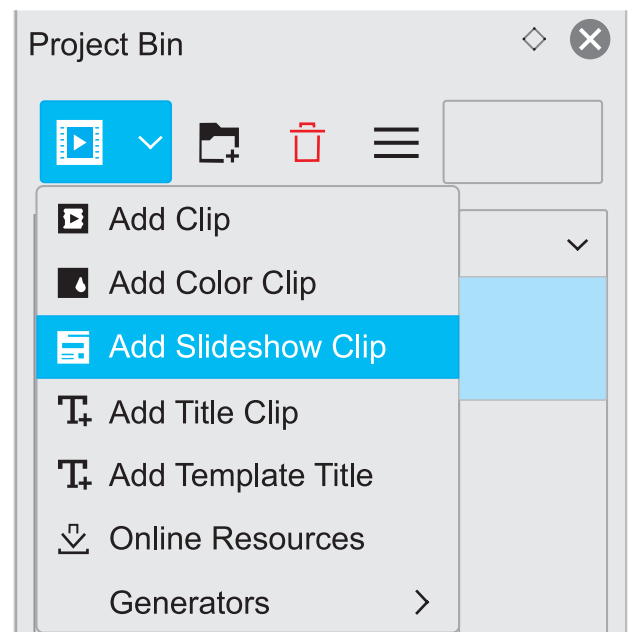
- Select the duration for which you want to keep one picture; for example 3 sec.

- Select Dissolve and Wipe transitions. From wipe transitions, we can select different options like luma1.pgm etc.

- Select animation zoom and pan and then click ok.

  This will add the Slide show clip in

the Project Bin. You can rename it by double-clicking on it.
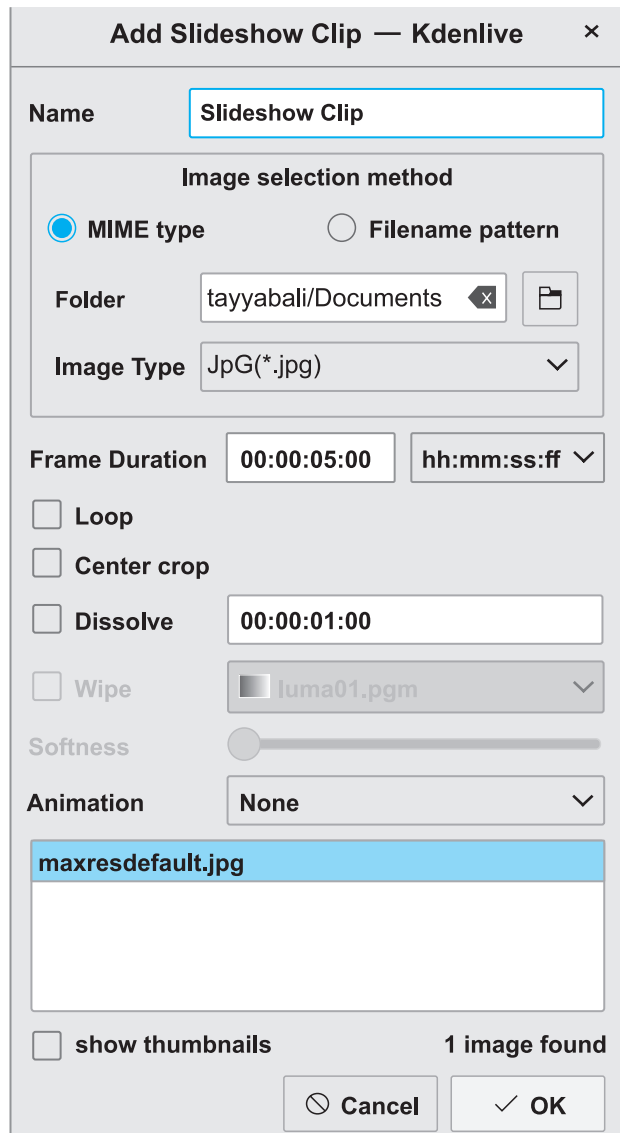
Step 4 : Add the audio clip to the timeline from the same arrow of the bin but this time selects the Add clip option. We can arrange all the files in a project bin in separate directories by clicking the Create folder option.
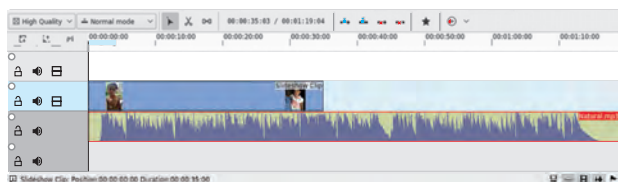
Step 5 : Now lets drag Slide show clip in the Video 1 timeline and Audios into audio one timeline. As shown below.

Do you notice the Slide show duration and Audio clip duration in the bottom left corner, we need to crop the audio to match the video.

Step 6 : Move the mouse to adjust the audio to match the video portion. Here basically we are cutting the last portion of the audio.
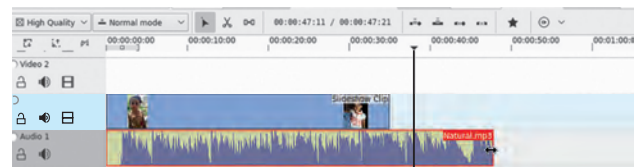
Step 7 : Add two effects to the audio clip, from effects menu, fade in and fade out. To add fade in and fade-out effects, we can use the effects window and search for fade. It will show both the effects.

Search for Fade in :

To add, we can either drag and drop on the audio clip or if the clip is selected, we can double click. Add both the effects fade in and fade out.
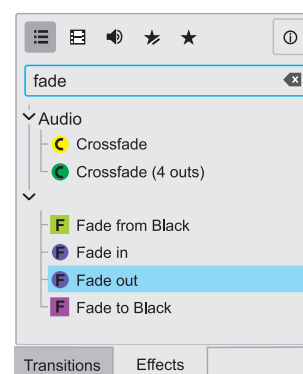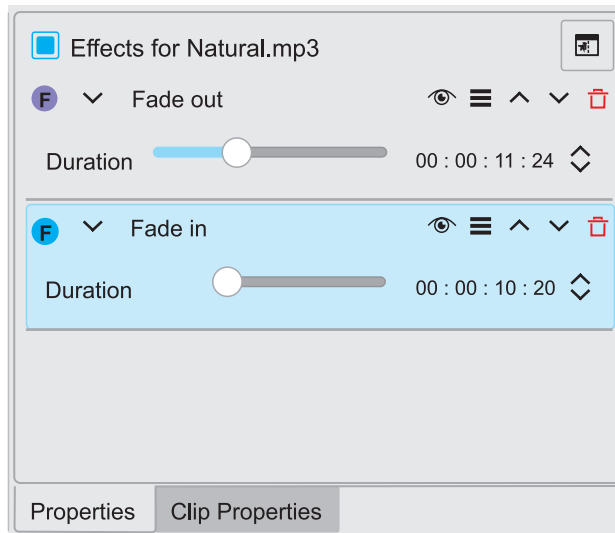
Changing properties of the effects

Once the effects are added, we can change the duration of the fade in and fade out from the properties window as shown below alternatively; we can even use the mouse to adjust the duration.

Use the **space button** to play music and use the mouse cursor to select from where you want to play.
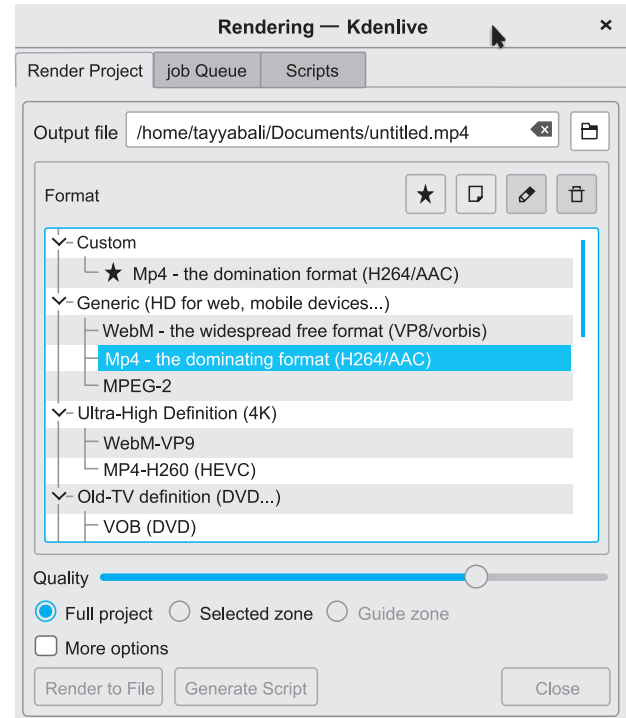

Step 8 : Export the video in video editing, exporting video is called **rendering**. To render the video, you can go to the Project menu and render option (CTRL + Enter).

Project Render Options

We have the following options to choose

1. Output file name and location to save

2. Select File Format

3. Choose Quality of the output files

Here we will select, Mp4 widely used format and click Render to file button.

Do it yourself

Export video in different formats and explain the difference between the exporting types and quality. Also discuss the latest video file formats.

3.13 Adding effects and Transitions

Transitions decide how Kdenlive blends from one clip into the next. You can add many different transition effects using Kdenlive's transitions.

Now we know how to add clips to the project and arrange in the timeline. Now let`s create a single video using multiple video clips. For making this video, we should have multiple small videos clips and multiple audio files for background.

To add transitions follow the given steps.

Step 1 : Create a new project with multiple video tracks and add video and audio files to the project bin.

Step 2 : Arrange all videos in different video tracks in sequence, video track will disappear and the next video will be shown, so arrange all videos as shown below.
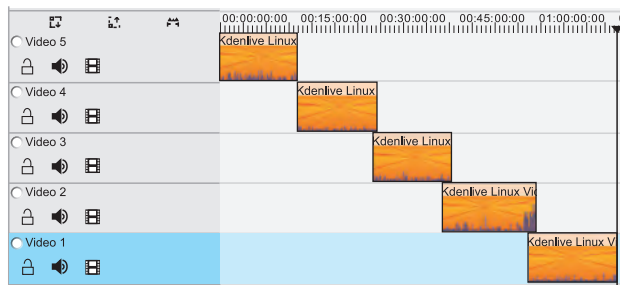
Step 3 : To add a transition, adjust clips in the timeline so that the end of one overlaps the beginning of another. We can use the mouse to zoom in and zoom out to see the video clips clearly in the timeline.

Step 4 : Then right-click in the timeline at the overlap point, select Add Transition, then choose one of the transitions from the flyout.

Step 5 : Select the transition added to the clips and adjust the duration as per the requirements

The Properties window displays the settings for the effects on the currently selected clip or the settings for the currently selected transition depending on whether it is a clip or a transition that is currently selected.

Step 6 : Finalize all the transitions, add the background audio and then export the video clips.

3.14 Adding Title to the Video :

Titles are text elements that can be added to the timeline which appears over the top of video clips. Titles are created in the **Project Tree** and then drag it to the timeline like other video clips.

If we want titles to overlay other footage, you put title clips on video track 1 and have the other footage on video track 2. We also need to retain the **affine** transition that is automatically added to the title clips to keep the footage visible underneath.

Steps to create title :

1. To create a title, choose Add Title Clip from the Project Menu or Right-Click in the Project Tree

2. Now we will get the title editor. Click the 'Save As' button on the toolbar to save the title clip. The Titles are saved as .**kdenlivetitle** type documents. We can load the title with existing title file also.

   Kdenlive has some built-in title templates that can be accessed from the Template drop-down list found on the bottom of the Title Clip window.

3. We can add image button. Selecting this brings up a file chooser where you can choose an image to be inserted into our title.

To make the title scroll vertically :

- Put a long title onto the title window. Zoom out so you can see it all. The text should run off the top (or bottom) of the viewable area.

- Select the Animation tab and click Edit start. Now drag the start rectangle to above the viewable area.

- Select Edit end and drag the end rectangle to below the viewable area as shown in the figure below

Click OK and preview the scrolling title.
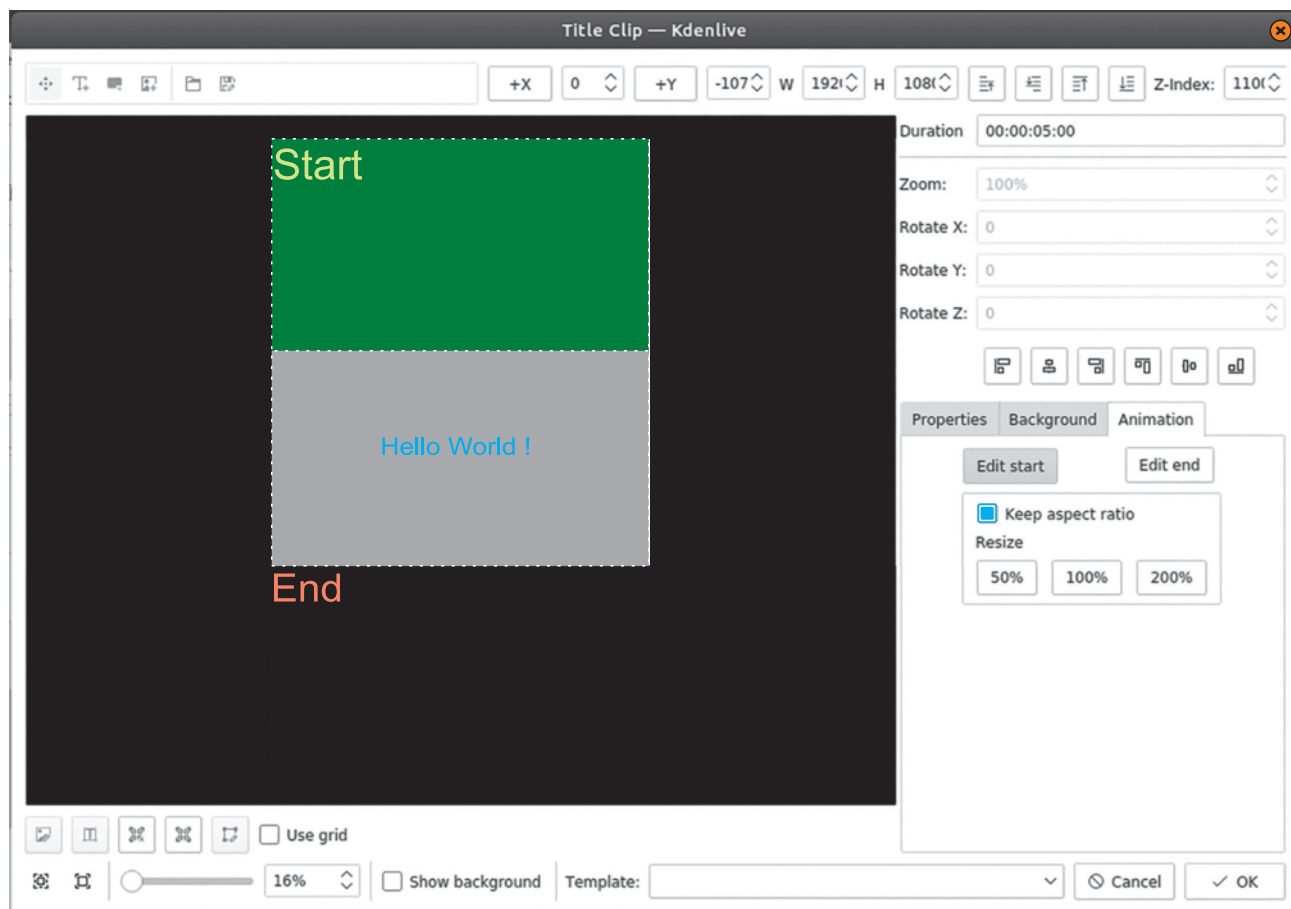
Fig. 3.12 : Kdenlive Title Editor

Do it yourSelf

Take a suitable English video and provide title and subtitles in your native language.

Summary

○ Audio editing is a process to edit, shorten or shift a piece of music or spoken audio, increase or decrease speed and volume or to create loop of certain portion of audio.

○ Audacity is an open source software allows to record, export and import various sound file formats.

○ Audacity allows to import and export common audio file formats like WAV, AIFF and MP3.

○ Audacity allows to apply various effects on audio like making sound louder/quiter, Fade in/out, sound play faster/slower, pitch lower/higher, adding echo and many more.

○ Video editing is the process of manipulating raw video clips, images, sounds to create a new movie or new video.

○ Linear editing, non-linear and live editing are the types of video editing.

○ Basic video editing principles are a) Do not cross 180 degree line, b) join videos in sequence & edit in sequence.

○ Kdenlive is an open source video editing software.

○ Activity to create a video using pictures with background music & transition is called as slideshow.

○ Transition effect decides how kdenlive blends from one clip into next.

○ Titles are text elements that can be added to the timeline and appear over the top of video clip.

Exercise

Q.1 Fill in the blanks.

1. Video tapes edited and accessed in sequence this older video editing technique is called as.............
video editing.

2. When video editing allows you to access any video frame while editing it is called as _____

3. Video Editing in which original content is not modified in the course of editing is called as _____

4. Sports events broadcast use_____ editing.

5. Connecting two seemingly unrelated scenes in video editing is called as ---------------- effect

Q.2 Select Single Correct Answer from the following.

1. Audio editing is the process of ......
   a) Recording the audio.
   b) Increase volume and decrease volumne of certain portion of volume.
   c) Sharing the audio file.
   d) Removing the noise, arranging the various audio clips together, adding various effects to sound.

2. Which of the following is not the area of audio editing?
   a) Radio Technician

b) Field Sound Engineer
c) Film Sound Recording
d) Choreography

3. Which of the following is not a audio editing software?
   a) Traverso
   b) Mixxx
   c) Adobe Audio Editor
   d) Ardour

4. Select the most approriate option from the following.
   a) Audio editing is a process where we record the audio first and then make it suitable for listening.
   b) Audio editing deals with recording audio so that it will be easy for editing.
   c) Audio editing deals with only the compiling songs together.
   d) Audio editing deals with everything related adding sound effects to sounds.

Q.3 Select Single Correct Answer from the following.

1. Which one of the following is not the correct option in the noise removal process of audacity?
   a) Noise reduction
   b) Sensitivity

c) Frequency Reduction

d) Attack/Decay time

e) Frequency Smoothing

2. While exporting the audio formats which of the following is not an option?

   a) Album Title

   b) Artist Name

   c) Month of Recording

   d) Studio

3. Which one of the following is not related in video editing?

   1) Noise reduction

   2) Cutaway

   3) Frequency Reduction

   4) Stock Footage

   5) Jump Cut

4. Select correct options from the following.

   1. **Contrast :** Cutting between two different scenarios to highlight the difference.

   2. **Parallelism :** Here you can connect two seemingly unrelated scenes.

   3. **Leit motif :** This is reiteration of the theme involves repeating of a shot.

   4. **Simultaneity :** Cutting between two simultaneous events as a way of driving up the suspense.

Q.4 Match the following.

'A'	'B'
1. Amplify	a) Increases or decreases the lower frequencies.
2. Equalization	b) This effect is ideal for reducing constant background noise.
3. Bass and Treble	c) Increases or decreases the volume.
4. Noise Reduction	d) Adjusts the volume levels of particular frequencies.

□□□

4.1. 3D Printing

There is a great revolution in printing techniques ranging from hybrid printing, nano scale printing, micro dispensing to 3D printing for use in various industries. Over the past couple of years, there have been significant advancements in technology. Currently, the use of artificial intelligence robots cloud-based technology drones and voice assistance are the recent technological trends.

The most popular form of printing technology which you will come across today is 3D printing i.e. Three Dimension printing. The very first commercial 3D printer was based on 'stereo lithography' technique. This was invented by Charles Hull in 1984. 3D printing was launched a couple of years ago, but it is estimated that by the year 2020 it will be generating a large revenue in the market. 3D printing enables you to produce complex shapes using less material than traditional manufacturing methods.

The creation of a 3D printed object is achieved using additive processes. In an additive process an object is created by laying down successive layers of material until the object is created. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object.

3D printing encompasses many forms of technologies and materials as 3D printing is being used in almost all industries. A few examples are dental products, eyewear, architectural scale models, prosthetics, reconstructing bones and body parts in forensic pathology etc

Do it yourself

Find out the 3D objects developed using 3D printer.

Working of 3D printing

3D printing is a fundamentally different way of producing parts compared to traditional printing. In 3D printing, no special tools are required (for example, a cutting tool with certain geometry or a mold). Instead the part is manufactured directly onto the built platform layer-by-layer, which leads to a unique set of benefits and limitations.

Fig. 4.1 : 3D Printing

Types of 3D Printers

1. Desktop FDM (Fused Deposition Modeling) printers melt plastic filaments and lay it down onto the print platform through a nozzle (like a high-precision, computer-controlled glue gun).
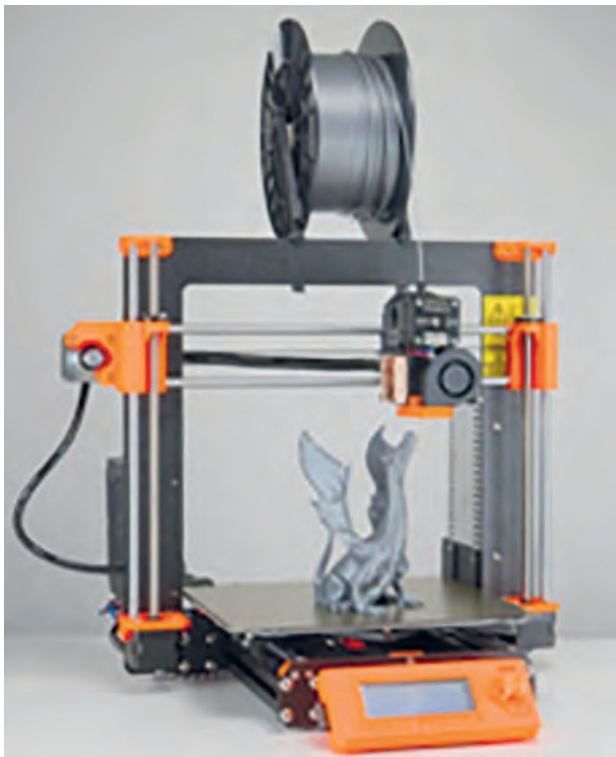

Fig. 4.2 : Working of 3D Printing

2. Large industrial SLS (Selective Laser Sintering) machines use a laser to melt thin layers of metal or plastic powders

Steps Involved in 3D Printing :

1. **CAD File Development :** In order to produce a 3D object you first have to have its virtual design. This is to be done using the Computer Aided Design (CAD) software with the exact dimensions of the objects.

2. **CAD File Conversions :** Once the CAD file is developed, the next thing one has to consider is converting it into specific file formats. The file formats are specified based on the technology of printing being employed by that particular 3D printer.

3. **Preparing The Printer :** Now that everything about the digital file is ready, you need to make sure the 3D printer is ready as well.

4. **The Building Up :** Once the process has started, it is now all about patience. These printers aren't as faster as the 2D printers. Based on the complexity of the object to be printed, the span of printing varies. Depending on the size of the part and the type of printer, a print usually takes about 4 to 18 hours to complete.

5. **Post Processing Stuff :** Once the entire process is done and the object is ready, make sure you handle it carefully. Any actions in haste could prove to be costly. So right from putting on some gloves to bring the object out of the printer to brushing off any residual powder, everything is to be handled carefully.

Fig. 4.3 : 3D models

4.2. Augmented Reality (AR)

Augmented reality (AR) is an interactive experience of a real-world environment. The objects that reside in the real world are enhanced by computer-generated perceptual information, including visuals, auditories and haptics. AR can be defined as a system that fulfills three basic features: a combination of real and virtual worlds, real-time interaction, and accurate 3D registration of virtual and real objects.

The hardware components for augmented reality are: a processor, display, sensors and input devices. Modern mobile computing devices like smartphones and tablet computers contain these elements, which often include a camera and Micro Electro Mechanical Systems (MEMS) sensors such as an accelerometer, GPS, (Geographical Positioning System) and solid state compass, making them suitable AR platforms. There are two technologies used in augmented reality: diffractive waveguides and reflective waveguides.

AR enabled Eyeglasses :

AR displays can be rendered on devices resembling eyeglasses. Versions include eyewear that employs cameras to intercept the real world view and re-display its augmented view through the eyepieces and devices in which the AR imagery is projected through or reflected off the surfaces of the eyewear lens pieces.

Fig. 4.4 : Person using virtual reality headset

Applications :

- **STEM (Science, Tenhnology, Engineering, Mathematics) education :** In educational settings, AR has been used to complement a standard curriculum. Text, graphics, video and audio may be superimposed into a student's real-time environment. Textbooks, flashcards and other

educational reading material may contain embedded "markers" or triggers that, when scanned by an AR device, produced supplementary information to the student rendered in a multimedia format.

- **Visual art :** AR applied in the visual arts allows objects or places to trigger artistic multidimensional experiences and interpretations of reality.

- **Video games :** The gaming industry embraced AR technology. A number of games were developed for prepared indoor environments, such as AR air hockey, Titans of Space, collaborative combat against virtual enemies, and AR-enhanced pool table games.

- **Industrial design :** AR allows industrial designers to experience a product's design and operation before completion.

- **Tourism and sightseeing :** Travelers may use AR to access real-time informational displays regarding a location, its features, and comments or content provided by previous visitors. Advanced AR applications include simulations of historical events, places and objects rendered into the landscape.

- **Translation :** AR systems such as Word Lens can interpret the foreign text on signs and menus and, in a user's augmented view, re-display the text in the user's language. Spoken words of a foreign language can be translated and displayed in a user's view as printed subtitles.

4.3. Virtual reality(VR)

Virtual Reality (VR) is the use of computer technology to create a simulated environment.

The term "virtual" has been used in the computer sense of "not physically existing but made to appear by software" since 1959. One method by which virtual reality can be realized is simulation-based virtual reality. Driving simulators, for example, give the driver on board the impression of actually driving an actual vehicle by predicting vehicular motion caused by driver input and feeding back corresponding visual, motion and audio feedback to the driver.

Fig. 4.5 : Image Of Virtual reality headset

Modern virtual reality headset displays are based on technology developed for smartphones including: gyroscopes and motion sensors for tracking head, hand and body positions; small HD screens for stereoscopic displays; and small, lightweight and fast computer processors.

Special input devices are required for

interaction with the virtual world. These include the 3D mouse, the wired glove, motion controllers, and optical tracking sensors. Controllers typically use optical tracking systems (primarily infrared cameras) for location and navigation, so that the user can move freely without wiring. Some input devices provide the user with force feedback to the hands or other parts of the body, so that the human being can orient himself in the three-dimensional world through haptics and sensor technology as a further sensory sensation and carry out realistic simulations.

Virtual reality cameras can be used to create VR photography using 360-degree panorama videos. 360-degree camera shots can be mixed with virtual elements to merge reality and fiction through special effects. Example google 3D Maps.

Applications :

1. Virtual reality is most commonly used in entertainment applications such as video gaming and 3D cinema.

2. Digital marketing and E-commerce.

3. Gaming industries.

Difference between AR And VR :

Augmented reality (AR) adds digital elements to a live view often by using the camera on a smartphone. Examples of augmented reality experiences include Snapchat lenses and the game Pokemon Go.

Virtual reality (VR) implies a complete immersion experience that shuts out the physical world. Using VR devices such as HTC Vive, Oculus Rift or Google Cardboard, users can be transported into a number of real-world and imagined environments such as the middle of a squawking penguin colony or even the back of a dragon.

Do it yourSelf

Find applications of AR and VR.

4.4. Fifth Generation (5G) :

5G is the fifth generation of cellular network technology.

5G is the next generation of wireless communications. It is expected to provide Internet connections that are least 40 times faster than 4G LTE. 5G technology may use a variety of spectrum bands, including millimeter wave (mmWave) radio spectrum, which can carry very large amounts of data a short distance. The drawback of the higher frequencies is that they are more easily obstructed by the walls of buildings, trees and other foliage and even inclement weather.

Millimeter wave: Millimeter waves are broadcasted at frequencies between 30 GHz and 300 GHz, compared with the bands below 6 GHz used for 4G LTE. The new 5G networks will be able to transmit very large amounts of data—but only a few blocks at a time. 5G networks are digital cellular networks, in which the service area covered by providers is divided into small geographical areas called cells. Analog signals representing

sounds and images are digitized in the telephone, converted by an analog to digital converter and transmitted as a stream of bits. All the 5G wireless devices in a cell communicate by radio waves with a local antenna array and low power automated transceiver (transmitter and receiver) in the cell, over frequency channels assigned by the transceiver from a pool of frequencies that are reused in other cells. The local antennas are connected with the telephone network and the Internet by a high bandwidth optical fiber or wireless backhaul connection. As in other cell networks, a mobile device crossing from one cell to another is automatically "handed off" seamlessly to the new cell.

5G can support up to a million devices per square kilometer, while 4G supports only up to 100,000 devices per square kilometer.

Applications :

1) Online 5G Games.

2) Automated Vehicles.

3) Virtual Classrooms.

Features of 5G are shown in fig. 4.6

Features of 5G
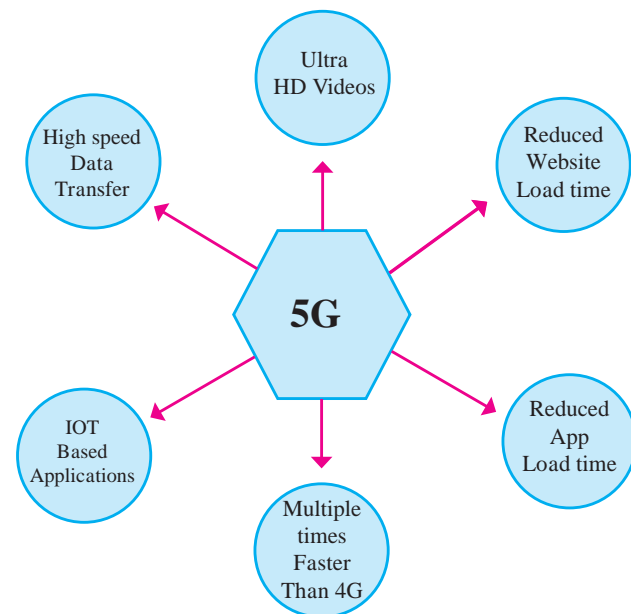
Fig. 4.6 : Features of 5G

Do it yourself

Find out various technologies used in smart cities.

Summary

○ 3D printing is the fastest method of making prototype models.

○ 3D printing plays very important role in the fields of medical, art and science.

○ AR Stands for Augmented Reality.

○ VR stands for virtual Reality.

○ 5G is the 5th generation of mobile communication technology.

○ 5G is the fastest method of data transfer.

Q.1 Fill in the blank.

1. FDM technique is used for...............

2. With the help of 3D printing, we can create .... models.

3. AR stands for............................

4. VR stands for ....

5. The 5ᵗʰ Generation of mobile communication technology is also known as..............................

Q.2 Match the pair.

'A'	'B'
1) F.D.M. Technique	a) 5G
2) Fastest method of data transfer	b) VR
3) Augmented Reality	c) 3D Printing
4) Virtual Reality	d) AR

Q.3 State whether the given statement are true or false.

1. FDM is the type of 3D printing Technology.

2. 3D gaming is an application of VR

3. 5G is 100 times Faster than 4G.

4. Ultra HD videos can be played at Faster rate by using 5G.

Q.4 Write short Answers.

1. Explain 3D Printing Technology.

2. Give some Applications of 3D Printing technology.

3. Explain Augmented Reality.

4. Explain Virtual Reality.

5. Explain Concept of 5G.

6. List some Features of 5G.

5 Open Street Map (OSM)

5.1. Introduction

Map is a symbolic representation of a region. Maps contain information which is valuable to us. We can plan our activities accurately using Maps.

We can find the shortest route for a journey or search for locations such as schools, colleges, hospitals, hotels, restaurants, cafes, gardens, buildings, towns, cities, rivers, lakes, mountains etc. Most importantly, maps are extremely useful for rescue operations in calamities such as flood, earthquake and volcanos.

Most of the maps belong to various government departments, organizations or companies. It may take a long time to procure these maps for some useful purpose. Also there are certain restrictions on the usage of these maps. Hence there was a severe need to make the open map of the world available publicly which can be used by anyone for study, research or any other purpose. To fulfil this need, Steev Coast founded Open Street Map (OSM) in 2004.

Today millions of people not only use Open Street Map but also contribute to improve it. It is our duty to map our neighbourhood or the places we visit. Every small contribution is valuable. It will make the OSM project rich and beneficial to all.

It is easy to do simple mapping and contribute to Open Street Map. In map editor we have to draw or trace buildings, roads etc. with the help of Arial View taken from satellite or drone. Such set of images is called as **imagery**.

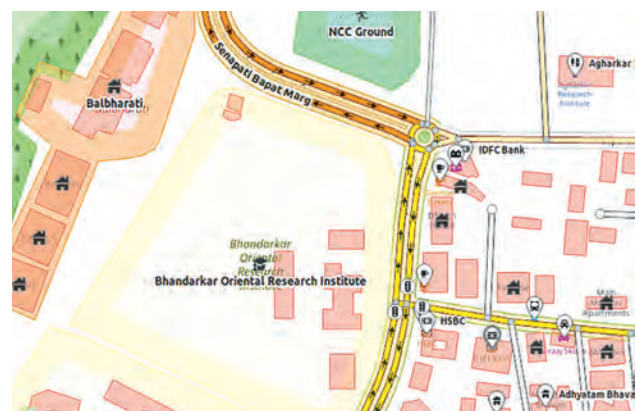**Fig. 5.1 : Satellite Imagery (Arial View)**

Fig. 5.2 : Standard Map, after tracing

Start Contributing : Let us learn and do few basic contributions

1. Go to openstreetmap.org and open an account.

2. Login to your account.

3. There is an interactive walk-through tutorial. Students are advised to go through tutorial.

   You can open the tutorial any time from the help option as shown in the following illustration.
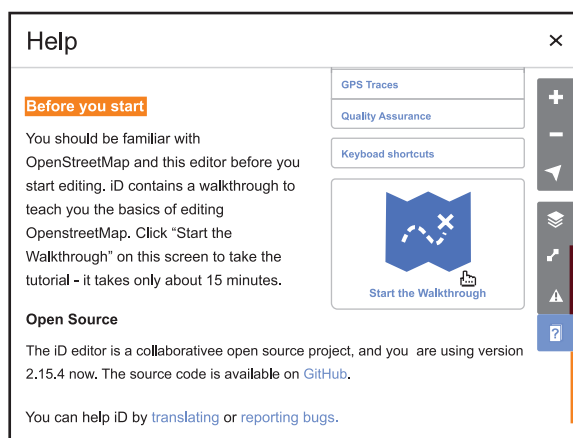

Fig. 5.3 : OSM tutorial

4. The site has three in-browser editors. First one is **iD editor,** which is simple and sufficient. We will use iD but you can use other editors as well. Select iD and proceed.

Fig. 5.4 : OSM Editor Selection

Note : Without editor selection, Arial View will not be available.

5. There are two main views that you should use - First is Arial view from satellite and the second is Open Street Map - standard view. You can switch back and forth through these two views or layers.

6. There are three important edits that you are supposed to do as your basic contribution.

   • First is Point or Point of Interest (POI).This can be restaurant, cafe, chemist, Mobile repair shop, monument etc. There can be several such points in a building.
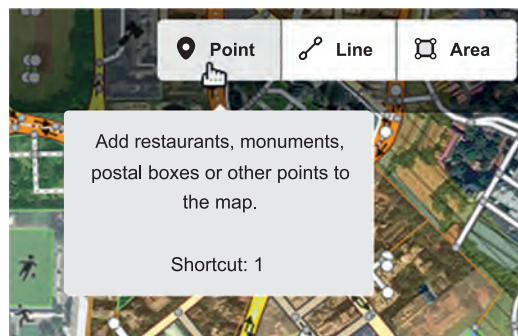

Fig. 5.5 : Point

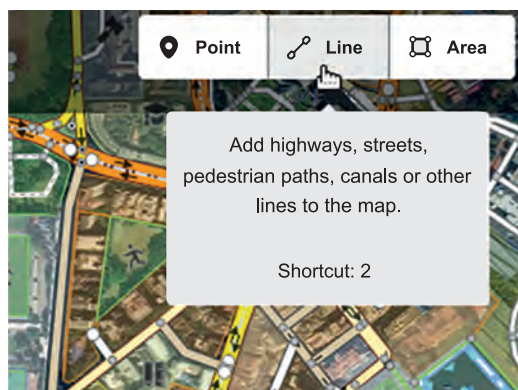   • Second is Line (Road, Foot Over Bridge, Pipelines etc).

Fig. 5.6 : Line

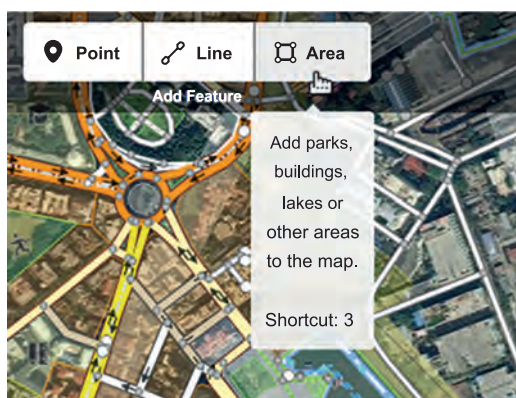   • Third is Area (park, building, lake, pond, play ground etc),

Fig. 5.7 : Area

Note : Ensure that you are logged in and iD Editor is selected.

7. Search any familiar place where you would like to contribute. Locate any building which is already having marked border. Identify it correctly from your local knowledge. This identification is most of the time easy if you already know its shape, size and surroundings.

8. Identify its name by nearby elements. Then click on it and in the resulting popup give its name say "xyz Mansion". Thats it ! This is your first contribution.
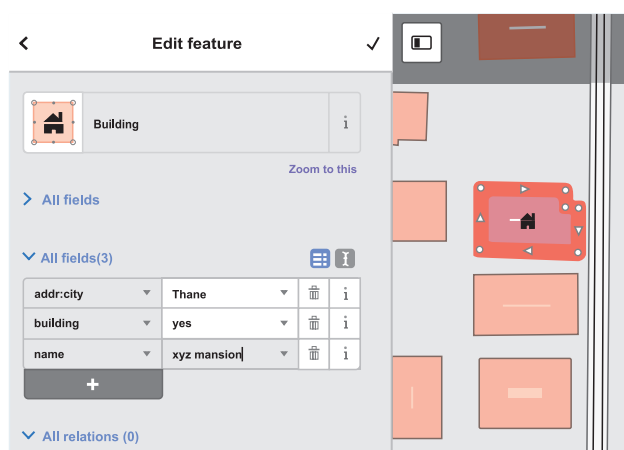
Fig. 5.8 : Edit Feature

9. If a building has no border, then switch to satellite image. Hit Area tool and make a closed rectangular or square region around it. Add more details if you wish, for example, level, height etc. You should right click the area object and click square option to refine the corner edges if required.
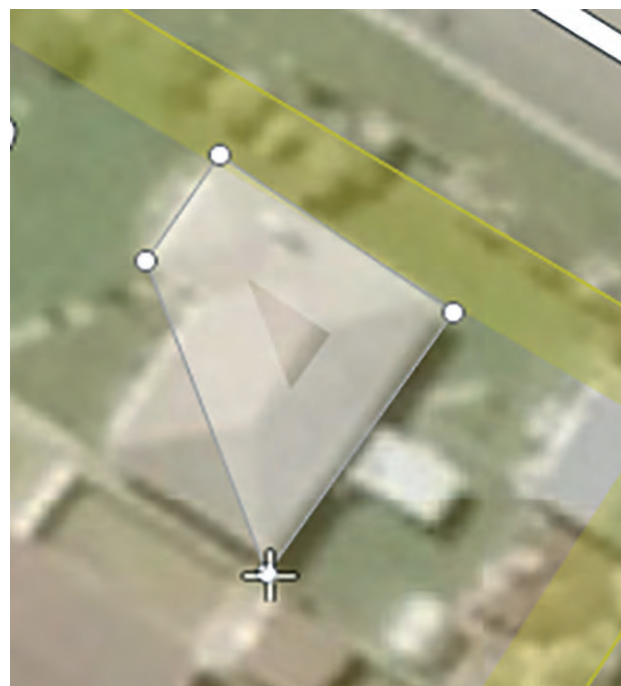

Fig. 5.9 : Building Mapping

10. Do the same for other areas like gardens, playgrounds, lakes etc. Points are also to be added at appropriate places so that the map will be even more useful to all.

11. If there are a few points of interests (POI's), add those too. For example if there is a Chemist shop in the building add point at appropriate place and tag with preset chemist. After a few edits you can save the changes using the save tab at top left

corner of the iD editor. All the edits up to now will be saved as a group called as Changeset. You have to put a comment or note about your edits, for example "Buildings near xyz school, Mumbai"

5.2. Mapping Basics

Most of the information on map is in the form of Basic Elements such as points (nodes), lines (paths or ways) and Areas (Shapes).

1. **Point or Node :** Point or Node represents the smallest object on map. It is usually a part of area or path or region. But sometimes, a point can represent a special object such as a tree, a shop or cafe, dispensary or junction or lamp-post etc. In such case it is called as Point Of Interest (POI). We assign tags (keywords) to such Points of Interests in order to give information about them. Any Point on a map has unique co-ordinates called as Latitude and Longitude.

2. **Lines or Ways :** Only points or nodes are not sufficient to describe information on maps. More complex objects like roads, rivers, boundaries are shown using Ways (lines or paths). Ways are the lines connected by nodes. The order of the points is important as this order determines the shape of the object and also direction or flow. Hence Way is an orderd list of nodes.

3. **Areas :** Apart from Points and Ways, there are Areas like Buildings, Parks, Playgrounds, Lakes on the map. They are represented by closed ways. Thus when first and the last node of a way coincide s we get an Area.

4. **Relation :** Although Point, Line and Area represent most of the objects on map, a few objects on map need a special type of element such as Relation to describe them. Relation is a combination of one or more of the basic elements viz point, line, area. For example, a building with open parking ground at the centre. Here there are two separate area elements used to descibe single object. Hence we combine them by a relation. In this case the relation used to combine two areas is called as Multipolygon. Another example of Multipolygon relation is lake with small islands.
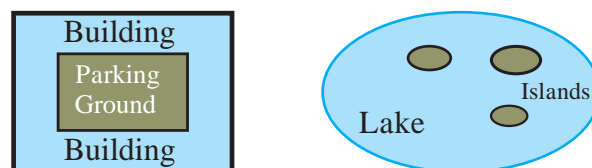
Tagging

Tag in OSM is a kind of label which describes the geographical object on map in a uniform way. Tag is always given as key-value pair. More precisely key=value (K=V). Key represents specific feature and Value is the proper description of the feature. Only ASCII and lower case characters are used in keys. Underscore (_) is used for space.

Example 1 : 'building' Tag (building=yes) is the most frequently used tag and you

would use it most of the time as a beginner. There is a preset in iD so if you click on building, from the left popup box, the iD editor assigns building =yes. If you know more details about the building then you can also add addtional tags. Let us say this building is your school, then apply the tag amenity=school. You can even add the name of your school with tag name=xyz school. If you know that there are 4 floors (levels) in the school building, add the tag level=4

Example 2 : Park or Garden Tag. To tag the park use leisure=park. In addition it is better to give name and operator. For example

leisure = park,name = Mahatma Gandhi Udyan, operator = MCGM, Mumbai

Example 3 : Roads In open street map. All roads are termed as highways. So even footpath is also tagged as highway. Thus for a foot path you should tag highway=footway. Other tagging options are highway=residential, highway=service (access roads to buildings, industrial use, business parks), highway=territory (road connecting small villages) etc. For highly important roads of the country which we generally call highway, the special value **trunk** is used in open street map. See following Example.

Example 4 : Tagging Important Roads.

(Eastern Express Highway)

highway	trunk
lanes	5

name	Eastern Express Highway
oneway	yes
ref	NH48
Ref:old	NH3

Tasking Managers :

Tasking Manager is a free and open source software tool which divides the mapping work of certain area into small pieces (tiles) and distributes these tiles among mappers. As a result the mapping task can be completed in short amount of time without overlapping or conflicts. This is usually done in vulnerable areas that require urgent mapping but it can be used for regular mapping too. The idea was first used by Humanitarian OpenStreetMap Team (HOT).

MapRoulette :

Fixing small issues in OSM is an ongoing process. You should always fix small issues arising from your own mapping sessions or from others if you come across them. Sometimes a bridge is not put on upper layer, roads are not properly connected. Area is left without tag.

A Game-like Tasking Manager called as MapRoulette is developed to increase participation. You can compete with other mappers by completing as many tasks as possible. The MapRoulette site provides set of challenges to work on. You can enjoy the MapRoulette's game like experience and at the same time give your valuable contribution to the world.

5.3. Java Open Street Map (JOSM) Editor

We have seen how to edit and contribute to open street map using iD editor. Let us take a look at other editors and tools by which you can contribute to OSM.

Java Open Street Map Editor (JOSM) is much more powerful than iD, Potlatch and other online editors. JOSM is a portable desktop application. Just download the jar file and execute. Java Runtime Environment (JRE) is required to run JOSM.

The main advantage of JOSM editor is that it allows offline editing. You first select an area that you want to edit. Download the selected area and then start editing. Since internet connection is not required, editing is faster. After you finish with editing, you can connect to the internet and upload your changes to OSM server.

Apart from offline editing, there are many more advanced features and plugins available in JOSM. Therefore many advanced mappers prefer JOSM to other editors.

5.4. Android Apps for OSM editing

With increasing popularity of Android Based smart phones many aplications have been created to assist you in contributing OSM. We take a quick overview of most useful apps for mappers.

1. **OsmAnd :** It is an offline navigation app with voice guidance. It is not a complete OSM editor but one can add and upload POI's. Also you can record and upload GPX files easily.

2. **Vespucci :** It is a fullfledge OSM editor. It works like JOSM. One needs to download an area and add points, ways and areas. Due to lack of mouse and small screen of the smartphone, it is not as efficient as desktop editors. But for field workers or at places where desktop computers are not available, Vespucci is an important and valuable tool.

5.5. Opening hours

Opening hours is often an important information for the map user. Small shops, supermarksets, parks, chemists etc are open at certain time of the day. There is a standrard format in which this information is filled in open street map.

Abbreviation	Day of week
Mo	Monday
Tu	Tuesday
We	Wednesday
Th	Thursday
Fr	Friday
Sa	Saturday
Su	Sunday

Examples :

1. General 5 day week : Monday to Friday from 11 am to 5 pm
opening_hours=Mo-Fr 11:00-17:00

2. Multiple time intervals : Monday to Friday from 11 am to 2 pm and 3 pm to 5 pm
opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00

3. Multiple days :
opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00

4. Off on public holidays
opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00; PH off

5. Different hours on public holidays
opening_hours=Mo-Fr 11:00-14:00, 15:00-17:00; Sa 11:00-14:00; PH 11:00-12:00

Summary

- Maps are useful in everyday life and also in calamities.
- Open maps, like OSM, are always accessible to all. So we should prefer them to closed commercial maps.
- We learned elementary map objects - point, line, area and multipolygon.
- We used in-browser editor iD to edit and contribute to OSM.
- Only basic mapping skills are needed to contribute to OSM.
- Tasking managers are very useful to divide mapping work and complete certain tasks in time,
- There are Android apps for using and contributing to OSM.
- Expert mappers often use advanced mapping editors like JOSM.
- Every small contribution to OSM is valuable.

Exercise

Q.1 Fill in the blanks.

1. In open street map several edits in one session are saved in a --------------

2. In open street map, POI stands for -------------

Q.2 Choose the most correct answer.

1. Following is an example of in-browser open street map editor.

   a) iD
   b) Libre Writer
   c) Emac
   d) Gedit

2. Follwing is an example of in-browser open street map editor.

   a) Ubuntu
   b) Nano
   c) Emac
   d) Potlatch

Q.3 Multiple Choice.
(Two Correct Answers)

1. Following two are in-browser editors.

   a) iD
   b) Nano
   c) Emac
   d) Potlatch
   e) inkscape

2. Following two are open street map tags

   a) iD
   b) buiding
   c) Emac
   d) Potlatch
   e) park

Q.4 Multiple Choice.
(Three Correct Answers)

1. Following three are basic elements in open street map.

   a) Point
   b) Histogram
   c) Colour
   d) Line
   e) Area
   f) Charge

2. Following three are tasking managers in open street map.

   a) HOT
   b) Maproullete
   c) Dolphin
   d) Line
   e) Synaptic
   f) TeachOSM

Q.5 Match the following.

A	B
1. Multipolygon	a) Imagery
2. Tag	b) iD
3. In-browser editor	c) Lake with island
4. Satellite	d) key=value

Q 6. Answer in brief.

1. What are the various applications of map ?

2. Distinguish between Open Street Map and closed commercial maps.

3. Explain any two basic elements of Open Street Map.

4. What is the purpose of tasking managers in OSM ?

5. Write a note on JOSM.

Let us learn

- Meaning of Marketing.
- Meaning of Digital Marketing.
- Marketing channels in Digital marketing.
- Concept of Search Engine.
- Organic and paid search.
- Categories of SEO : Black Hat SEO and White Hat SEO.
- Different SEO strategies.
- Long tail and short tail keywords.
- Actual working with SEO.
- Concept of Google Analytics.

Dr Ajay Kumar is senior vice president marketing at "Click and Boost India Private Ltd". He is a digital marketing expert and social media specialist. He has over 10 years experience in the digital marketing niche.

Mr. Suhas has floated a small company which manufactures springs and bearings required for machines . He is facing a problem to market his product through website. He appointed Dr. Ajay as consultant for Digital marketing.

Given below is the conversation between Dr. Ajay and Suhas. The idea behind this dialogue lesson is to make students understand the different aspects of digital marketing

Mr. Suhas : "Good morning sir !" I want to understand new method of marketing for website, will you please explain me how I can do digital marketing? What is this all about?

Dr Ajay : Marketing has always been about connecting with your audience in the right place and at the right time. In today's era of technology it simply means you need to meet them where they are spending more time and that is on the internet.

While traditional marketing might exist in print ads, phone communication, or physical marketing, digital marketing can occur electronically and online. Digital marketing is the use of the internet, mobile devices, social media, search engines, and other channels to reach consumers.

Mr. Suhas : Sir, You mean to say that online advertising means digital marketing?

Dr Ajay : Well, you are partially correct but not fully, let me explain. Digital marketing is not new. It's been around since the Internet started. Now digital marketing is becoming popular due to the increase in internet users, mobile phone users and digital content consumption.

Digital Marketing simply defined as an umbrella including all internet or online marketing activities that helps in the brand

promotion or lead generation in today's competitive business environment.

Think about the last important purchase you made. Before buying, you probably would have searched the internet to learn about the product you wanted and what your best options were. And your ultimate buying decision would have been based on the customer reviews, features, and pricing you researched.

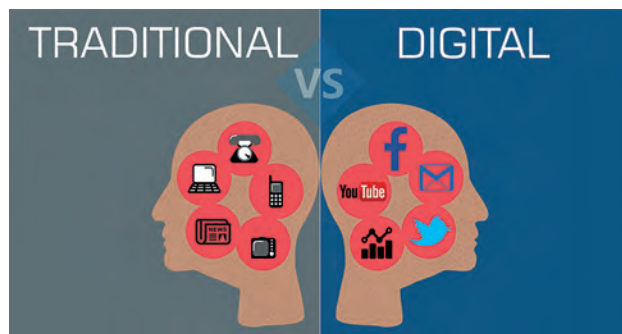Purchasing decisions are online now-a-days. Hence, an online presence is absolutely necessary regardless of what you sell.

Fig. 6.1 : Traditional vs Digital

Traditional Marketing examples might include tangible items such as business cards, print ads in newspapers or magazines. It can also include posters, commercials on TV and radio, billboards and brochures.

The world of **digital marketing** continues to evolve as long as technology continues to advance. Examples of digital marketing include things like websites, social media mentions, YouTube videos, and banner ads. Specifically, digital marketing is similar to traditional advertising, but using digital devices.

Mr. Suhas : Ok Sir, How digital marketing will help me to promote my business online? Is there any tactic or method or channel to rank my product on search engine?

Dr. Ajay : Yes Sir! Let us understand some **Marketing Channels in Digital Marketing**

Fig. 6.2 : Marketing channels Digital

1. **Search Engine Optimization :** SEO is the process of boosting content and technical set-up of the website so that it appear at the top of a search engine result for specific keywords. SEO is to attract visitors to your website when they search for products or services related to your business.

2. **Content Marketing :** Have you heard the saying, "Content is king?" Quality content is the fuel that drives your Digital Marketing strategies. Content Marketing denotes the creation and promotion of content assets in order to generate brand awareness, lead generation, traffic growth, and

customers. The channels that play a part in your content marketing include video, blogs, e-books etc

3. **Paid Search :** Paid search or pay-per-click (PPC) advertising refers to the "sponsored result" on the search engine results pages (SERP). PPC ads are visible, flexible, and effective for many different types of organizations. With paid search, you only pay when your ad is clicked. You can tailor your ads to appear when specific search phrases are entered, targeting them to a particular audience.

4. **Social Media Marketing :** Social Media Marketing promotes your brand and content on social media channels in order to increase your brand awareness, drive relevant traffic, and generate leads.

5. **Email Marketing :** Companies communicate with their audience through email marketing. Emails are used to promote content, events, and discounts, and also to direct people toward the business's website.

6. **Mobile Marketing :** From SMS and MMS to in-app marketing, there are many ways to go through with mobile marketing.

Mr. Suhas : Ok sir. So I need to use any one of the above channel to make my product rank top on search engine right?

In today's competitive market, Online marketing is more important than any other marketing. With the help of smart phones browsing for a required or sometimes not required things has become a tendency of a human beings. But what is Search Engine Optimization? Why we must do SEO?

Dr. Ajay : Ok wait lets understand terms one by one

Search Engine : A web search engine or Internet search engine is a software system that is designed to carry out web search (Internet search), which means to search the World Wide Web in a systematic way for particular information specified in a textual web search query. The search results are generally presented in a line of results often referred to as Search Engine Results Pages (SERPs).

The information may be a mix of links to web pages, images, videos, info graphics, articles, research papers, and other types of files.

Do it yourself

Make a list of Search Engines, Browsers you Know.

Dr. Ajay : To understand this let us compare Search Result of Yahoo and Google for same product and we compare them. Have a look to search results
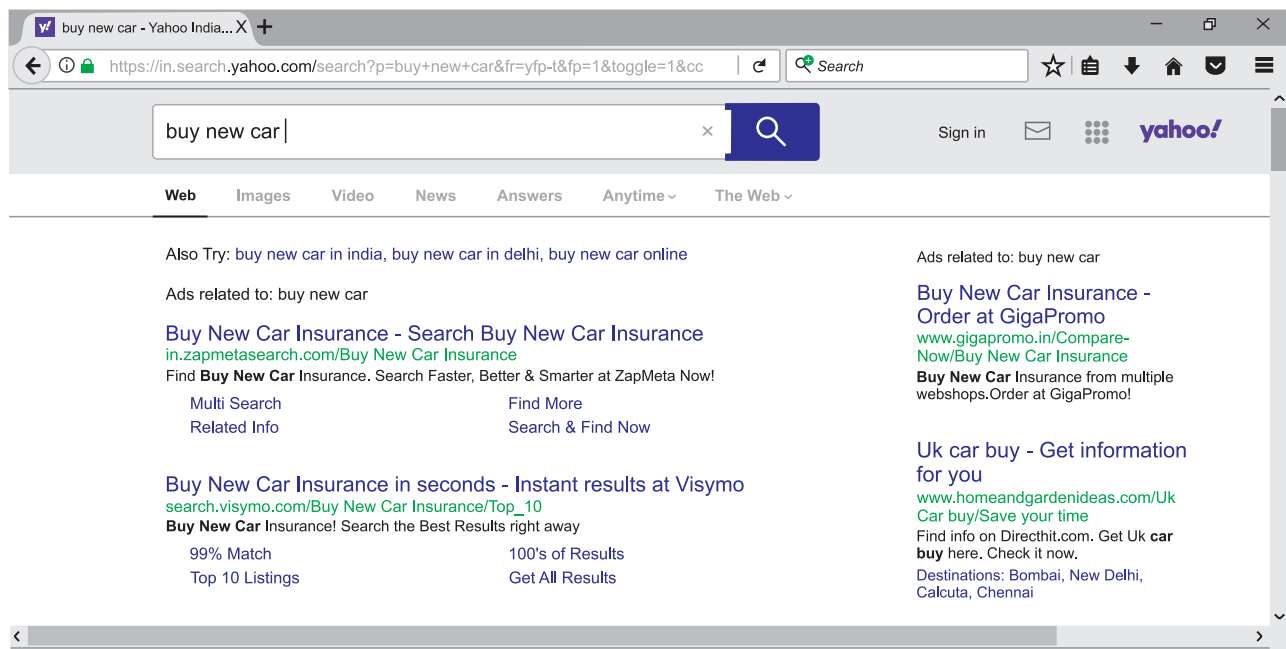
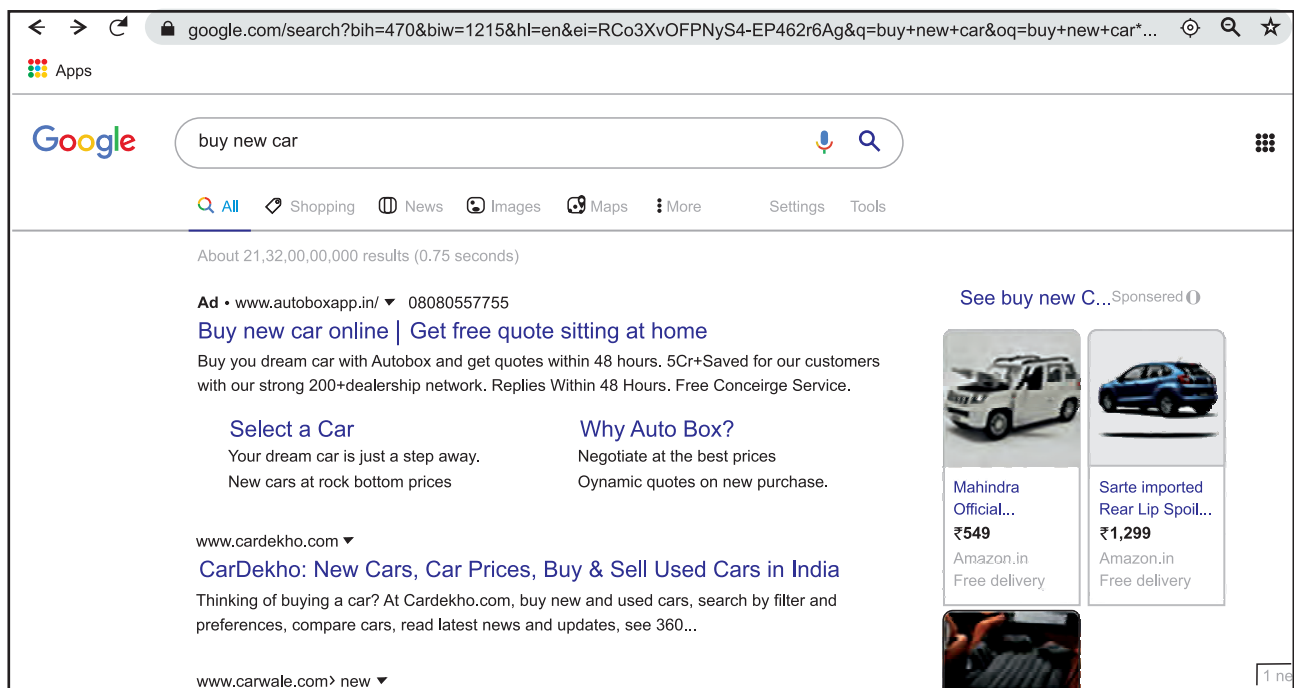**Fig. 6.2 : Result of Yahoo Search Engine to buy a new car**

Fig. 6.3 : Result of Google Search Engine to buy a new car

Now you can easily differentiate the result shown by two search engines i.e. Yahoo and Google. It is showing different websites having information for buying new car. The entire SEO works on keywords. If those keywords are being used in the content of the website then that website may rank in top ten or twenty search results. Google has a few tools that make it easy to conduct keyword research. One can insert any keyword, multiple keywords, or even the website

address, and Google will then return a list of related keywords.

Mr. Suhas : oh yes! It is crystal clear now how search engine plays important role in ranking the website. Please tell me shall I pay and rank my website or is there any other way which is economical which I can use to rank without paying.

Dr. Ajay : Yes sir There are two ways to rank website one can **pay and rank** and other is without payment one can rank website doing **SEO process. ie Organic Search.**

Let us understand difference between **Organic Search and Paid search**. Look at these two figures fig. 6.4 and fig. 6.5

and you will understand that you can pay Google or any Search Engine and rank your website on top of search. The keyword **Ad** marked here fig 6.4(a) shows that this site has paid Google search engine to rank him at top. Fig.6.5 shows the keyword **Sponsored** which is also paid site to rank the images and information at top. In fig 6.6 the searched web site is so popular that many users must have visited it. Therefore it has become popular and it is ranked by search engine on its first page . Why we must opt for first five pages because as we go on higher page number, customer does not search those pages or there are very less visitors as page number grows.
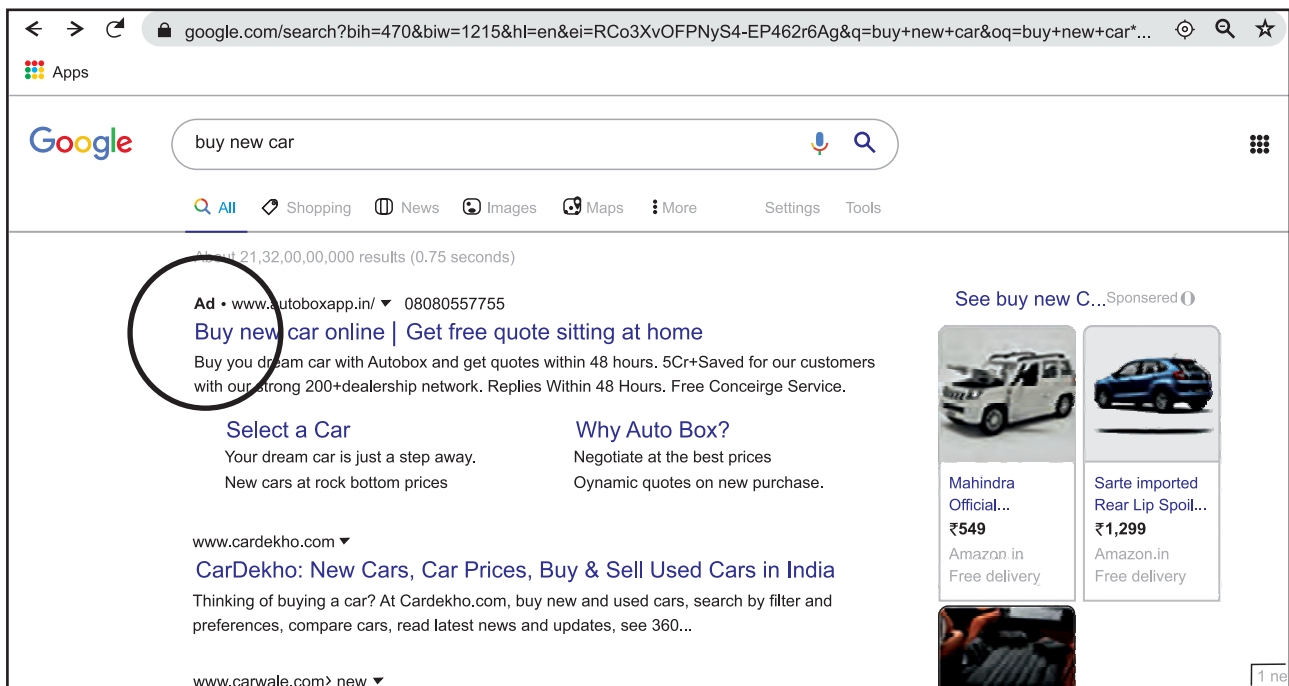

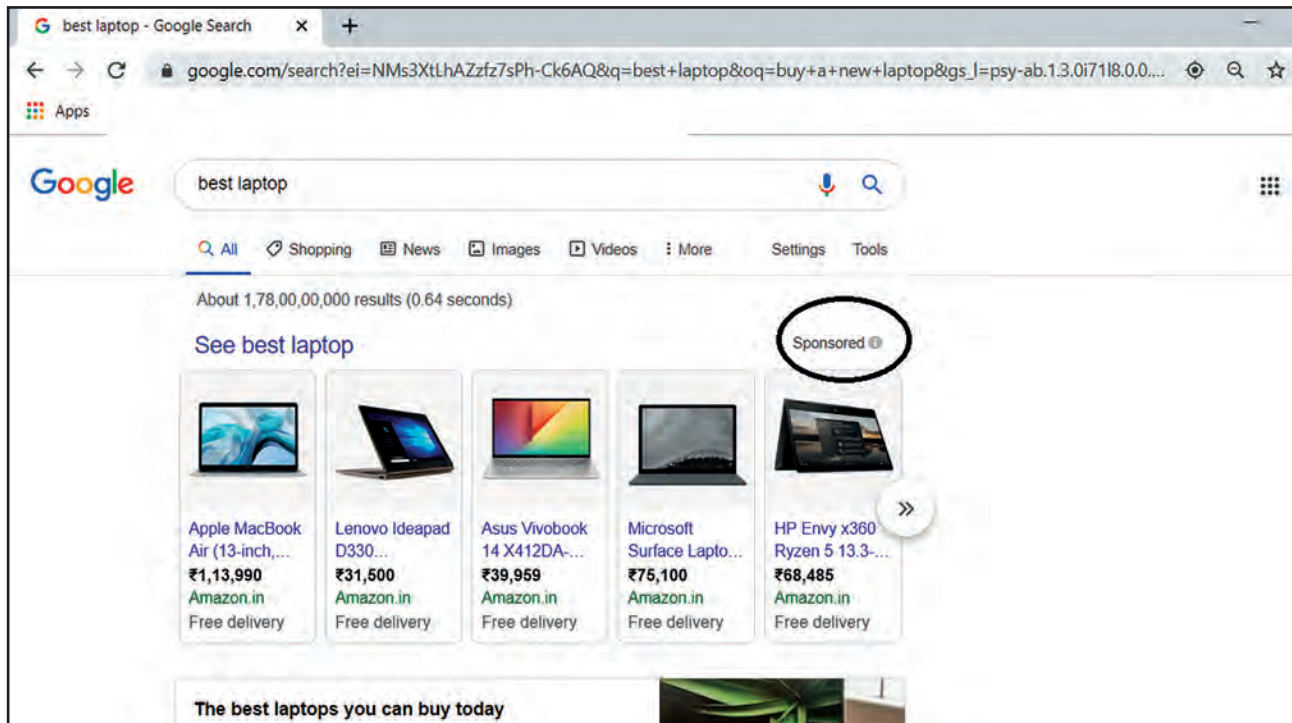**Fig. 6.4 : Links with advertisements are called as "Paid Search"**

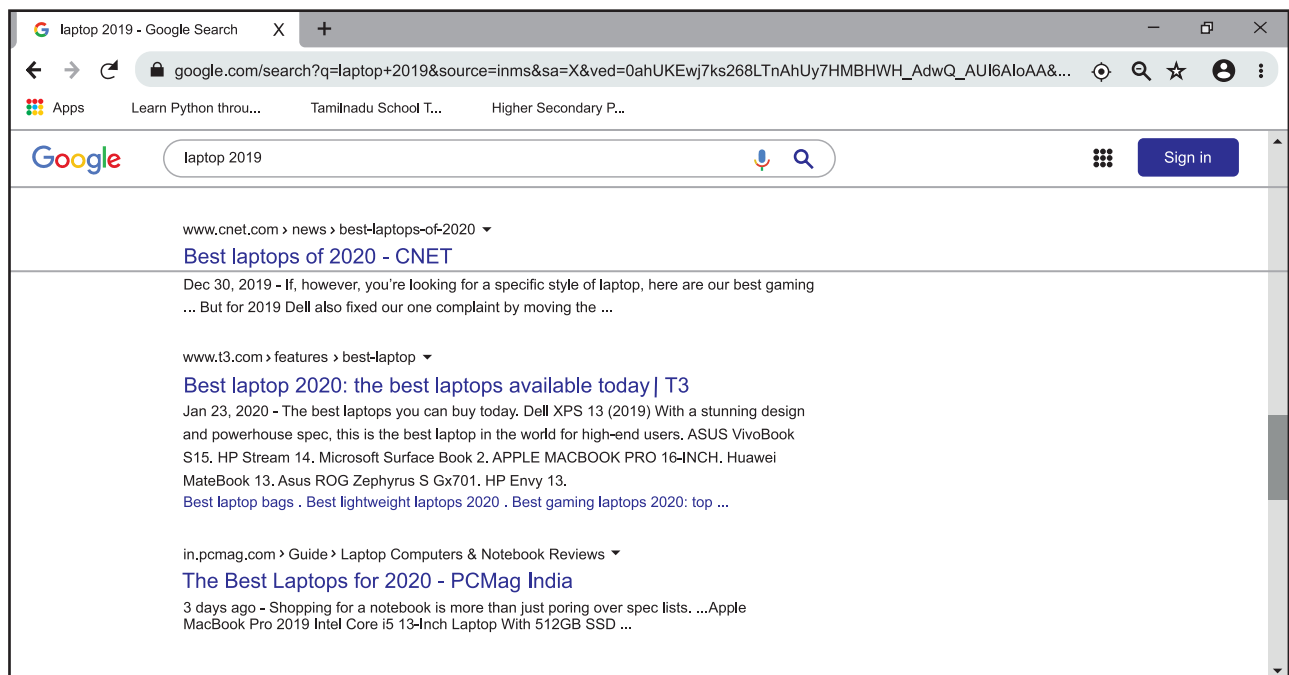**Fig. 6.5 : Links with advertisements are called as "Paid Search"**

Fig. 6.6 : Links with Organic Search

Dr. Ajay : Now let us see how we can rank our website with help of SEO. Techniques and strategies used to get higher search rankings, and breaking search engine rules are-

1. Black Hat SEO

2. White Hat SEO

Mr. Suhas : What do You Mean by Black Hat and White Hat SEO?

Dr Ajay : Let us understand White Hat SEO and Black Hat SEO.

i. White Hat SEO involves looking for ways to improve user experience ethically and genuinely. It ensures that Web Page content should have been created for the users and not just for the search engines. This means some market specialist create an artificial content which contains key words and those keywords you use as your search strings

ii. Black Hat SEO relies on manipulating Google's algorithm to improve rankings. By creating a rogue copy of a popular web site which shows contents similar to the original web site. The Google crawler reads the content and thinks the website is original one and it ranks the page. Crawler is a program used by search engines to collect data from the website. For example if you are in a grocery shop mall you have to walk down each section and look at the products before you can pick out what you need. In the same way, search engines use web crawler programs as

their helpers to browse the Internet for pages before storing that page data to use in future searches.

Note : REMEMBER - Always follow a White Hat SEO tactic and don't try to fool your site visitors. Be honest and definitely you will get proper rank. Now Google's search algorithm has become intelligent as it finds you are fooling to rank your website. It ranks you down and black list you and your business.

Do it yourself

Search on internet and distinguish between Black Hat SEO and White Hat SEO

Mr. Suhas : I heard something about On Page SEO and Off Page SEO can you please tell me something about it

Dr. Ajay : Search engines don't look at a page the way a person looks at it. They can only read the source code of the page. If you right-click on any webpage, you'll likely see an option for viewing that page's source code(HTML code). If you're not familiar with HTML code it will look like a jumbled mess. But it is this mess that search engines comb through looking for clues. There are a number of ways to approach SEO to generate traffic to your website. Those are **on-page SEO, off-page SEO and Technical SEO.** Have a look on differences between On Page SEO, Off Page SEO and Technical SEO.

On-Page Ranking Factors	Off-Page Ranking Factors	Technical Ranking Factors
● Page and website content ● Website performance ● Website accesibility ● Trust signals	● Trusted links ● Brand Mentions ● Website Partners	● Security of a website ● Loading speed ● Image Tags ● Website Structure

Fig. 6.7 :Different SEO approach

1. **On-Page SEO :** Anything within < > is HTML code. Anything between two sets of tags is something that could get put on the page for a person to read. The text inside the <> tells browsers and search engines how to render the information between the tags. Thus, if you had this bit of code: <title>Welcome to my site</title> you would see "Welcome to my site" in the title bar of the browser window. And if you were to pull this page up on a search engine, "Welcome to my site" would be the name of the link you would click.

    Search engines use tags like <title> to get clues about what a web page is about. On-page SEO techniques tweak these tags and the information they hold to make search engines display those pages to the right kinds of searches (like through adding keywords) or get them to rank higher (by using keywords and tags that show more relevance to a search query).

    The reason it is called on-page SEO is that these changes are visible to readers. If you add in a header tag, they can see the header. If you change your sentences around to add more keywords, those changes are visible. Thus, On-page SEO is a balance between giving the right information to search engines without compromising the information that your customers are reading on the page.

2. **Off-Page SEO :** Off-page SEO is about everything that doesn't happen directly on your website. Optimizing your website is called On-page SEO and includes things like site structure, content and speed optimizations. Off-page SEO is about, among other things, link building, social media, and local SEO. It allows generating traffic to your site and making your business appear like the real deal.

3. **Technical SEO :** Technical SEO is a very important step in the whole SEO process. If there are problems with your technical SEO then it is likely that your SEO efforts will not generate the expected results. A simple example of technical SEO is site speed. People

do not like to wait for slow websites. If your pages load slowly, you will be ranked lower than a comparable site that has faster pages. Another example is mobile friendliness. If your site looks bad on a mobile device, search engines can detect that and lower its rankings on mobile-specific search engines.

Mr. Suhas : Oh yes sir now I understood I must put relevant content on my website. But then how I can think my content is relevant or not?

Dr. Ajay : Your company is manufacturer of springs and bearings. While developing the website, a website designer must take care to add keywords such as Compression Springs, Extension Springs, Drawbar Springs etc. If such keywords are used in the <meta> tag while creating a website that means topic or aim of website is same and its contents are relevant so relevance of content is more important factor to rank . The content must be designed using HTML5 or HTML tags ie use <b> <i> <u> <h1> <h2> etc Tags. Even the alt attribute of images must be used with keywords so crawlers cannot read image but they read description and classify the content.

Mr. Suhas : Sir please elaborate the concept of keywords.

Dr Ajay : To rank your website you must follow the tactic of Long Tail and Short Tail keyword concept

Dr Ajay : A long tail is long keyword and short tail is short keyword. People have memory to remember short words but they are lazy to use long word. You can use your intelligence to rank your website sometimes using small key words or long keywords. Lets understand with a small example. If I want to search shoes and I gave keyword to Google or Yahoo search engine as 'shoes'; it is a small keyword used by millions of people. Here your search result shows only popular websites on the first few pages and if your website is just born (new) then you can't expect your Website can be shown first page. But now you used a keyword in your content <meta> tag "Brown Soft Comfortable Running shoes" such a long keyword may be your website alone uses it and its ranked up on first page.

Mr. Suhas : Now suggest me a tool which can work and tell me what is short fall in my website so I can successfully evaluate my website optimization.

Dr Ajay : Actual working with SEO

Now with the above prerequisite knowledge about SEO we will now move ahead for actual optimization with the help of the website https://www.seoptimer.com/ . With the help of this tool it is possible to optimize the website. It will make easy to find the credentials where improvements can be done.
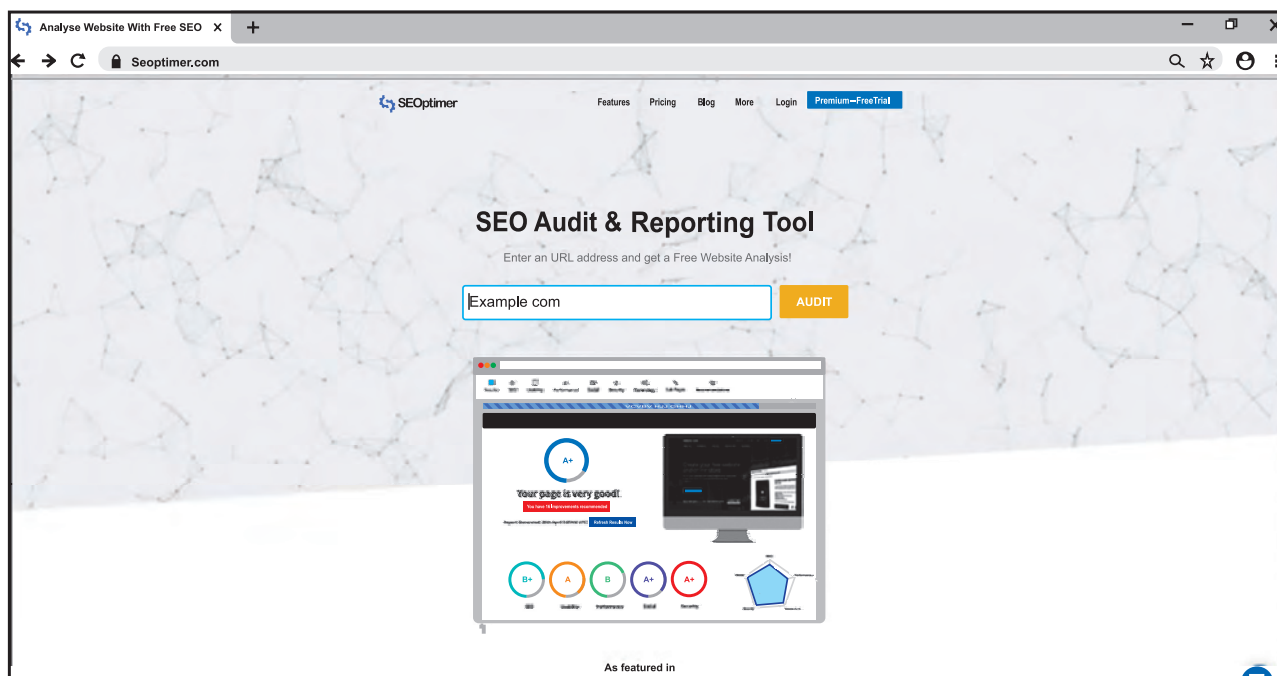
Fig. 6.8 : SEO Audit & Reporting Tool

Mr. Suhas : Sir I heard that Google Analytics helps in ranking your website at top. How?

Dr. Ajay : Now let's learn in detail about Google Analytics. Google Analytics is a web analytics service offered by Google that tracks and reports website traffic, number of visitor, time spend on the site by visitors etc. The Google Analytics was not the product developed by Google it was acquired by Google from a company Urchin in 2005.

Now a days market is ruled by Consumer and not manufacturers. Price, quality and quantity are all criteria's to purchase a product as consumers are more aware. More cut throat competition is 'price' and comparison of price is easily available. Customers likes and dislikes need to studied. True SEO is similar to gardening. It's a little bit of constant work all the time until you get the big harvest.

Suhas : Thank you Sir! You have given me a positive thought now I will work on the strategy explained by you in this above explanation and improve my digital marketing even I will work on content and social media marketing too.

Dr Ajay : Thank you I wish you success in your task. Bye! Have a nice day.

Summary

- Marketing has always been about connecting with your audience in the right place and at the right time.

- Digital marketing is the use of the internet, mobile devices, social media, search engines, and other channels to reach consumers

- Important Key factors of digital marketing include: Search engine optimization (SEO), Marketing Analytics, Pay-per-click advertising (PPC), Web design, Content marketing, Social media marketing, Email marketing.

- SEO stands for Search Engine Optimization, which is the practice of increasing the quantity and quality of traffic to your website through organic search engine results.

- Organic search, also known as natural search, refers to unpaid search results.

- Keyword, short tail keyword, long tail keyword, Crawl /Crawler, Backlink, Indexing are the important terms in SEO.

- Techniques and strategies used to get higher search rankings, and breaking search engine rules are White Hat SEO and Black Hat SEO.

- SEO strategy can be divided into three different categories: on-page SEO, off-page SEO and Technical SEO.

- A long tail is long keyword and short tail is short keyword used by the user while searching any information.

- SEO can be perform with the free website https://www.seoptimer.com/.

- Google Analytics was acquired by Google from a company Urchin in 2005.

- Google analytics is used to track website activity such as session duration, pages per session, bounce rate etc. of individuals using the site, along with the information on the source of the traffic.

Exercise

Q.1 fill in the blank.

1. _____ is the use of the internet, mobile devices, social media, search engines, and other channels to reach consumers

2. _____search is natural search.

3. ____SEO involves looking for ways to improve user experience ethically and genuinely.

4. ____ is a web analytics service offered by Google that tracks and reports website traffic.

Q.2 State true or false.

1. Digital Marketing requires physical market.

2. E commerce deals are carried out in physical market.

3. Digital marketing is carried out with the help of Portal.

4. In Digital marketing SEO means Special Executive Operations.

5. The paid Advertisement on google can be identified with Ad keyword.

6. To make the Traffic analysis SEO Technique is used.

Q.3 Multiple Choice Questions one Correct Answers.

1. _____SEO relies on manipulating Google's algorithm to improve rankings.

   a) Red Hat   b) White Hat
   c) Green Hat   d) Black Hat

2. To analyze the traffic coming to the Website _____ tool is used

   a) SEO optimer

   b) Google analytics

   c) Go daddy

   d) Amazon

3. If the speed of displaying the website is slow then _____ ranking method is used.

   a) technical   b) on page

   c) off page   d) load page

Q.4 Multiple Choice Question 2 correct answer.

1. _____ and ____techniques and strategies used to get higher search rankings on search engine.

   a) White Hat   b) Red Hat
   c) Black Hat   d) Green Hat
   e) Blue Hat

2. The product of Google analytics was originally developed by ___ company in year ___

   a) Urchin   b) 2005

   c) Google   d) 2008
   e) Microsoft   f) 1945

3. Valid two types of keywords are _____ and _____

   a) long tail   b) short tail

   c) small tail   d) big tail

   e) lengthy tail   f) tall tail

Q.5 Multipl Choice Question 3 correct answer.

1. Marketing Channels in Digital Marketing are

   a) Email marketing

   b) Content marketing

   c) Valid marketing

   d) Mobile marketing

   e) on page marketing

   f) off page marketing

2. Valid approaches SEO to generate traffic to your website are ___, ___ and ____.

   a) on-page SEO

   b) all-page SEO

   c) off-page SEO

   d) Technical SEO

   e) with-page SEO

   f) online-page SEO

SKILL ORIENTED PRACTICALS (SOP)

Note :

Students should file minimum 12 skill sets from the SOP's as follows-

- Advanced HTML5   - Any 05
- Basics of Audio Editing   - Any 04
- Basics of Video Editing   - Any 02
- Open street Map   - Any 01

1. Advanced HTML5

SOP 1 : **Creation of website using HTML5**

Create a website using HTML5 and CSS using any 4 CSS properties. Write a code for 2 separate pages having different file name such first page as Index. html, second page as page2.html as form.html. Use any theme such as college profile or company profile etc. Every page must contain proper Meta information and design web page as follows-

1) The index page must contain a heading which is highest among other text on pages and must be at centre of the page. There must be a paragraph which introduces general information about the theme chosen, must have at least 3 physical style tags and one image with alternate text. This page must be connected to other two pages with proper navigational links.

2) The 2nd page must contain the feedback or enrolment form related with theme chosen with feature of HTML5. The form must contain text element and email address of the company or person. Include the submit button.

SOP 2 : **Create a webpage using HTML and CSS code to design a webpage as the layout displayed below.**

The top section will display the heading , 'Tourist places' in header. The section on the left has list of cities. The right hand side display tourist places in any one of the city .

Use Inline style sheet in the top section to display background color for the text 'Tourist places'. Use internal stylesheet for the left and right section with background color and font styles.

<table>
<tr><td colspan="2" style="text-align:center">Tourist cities</td></tr>
<tr>
<td>City
1. Pune
2. Banglore
3. Hyderabad
4. Delhi</td>
<td>Tourist places in Pune
• Shaniwarwada
• Kelkar Museum
• Sinhgad fort</td>
</tr>
</table>

SOP 3 : **Create a website using HTML and CSS code to design a webpages as follows -**

The first webpage will accept the name of the traveller, date of travel, telephone number. It also has a submit button as an image .

The second webpage has information about the name of transporter, time, seat no and destination displayed one below the other in the form of unordered list as
Name of transporter – Air Asia
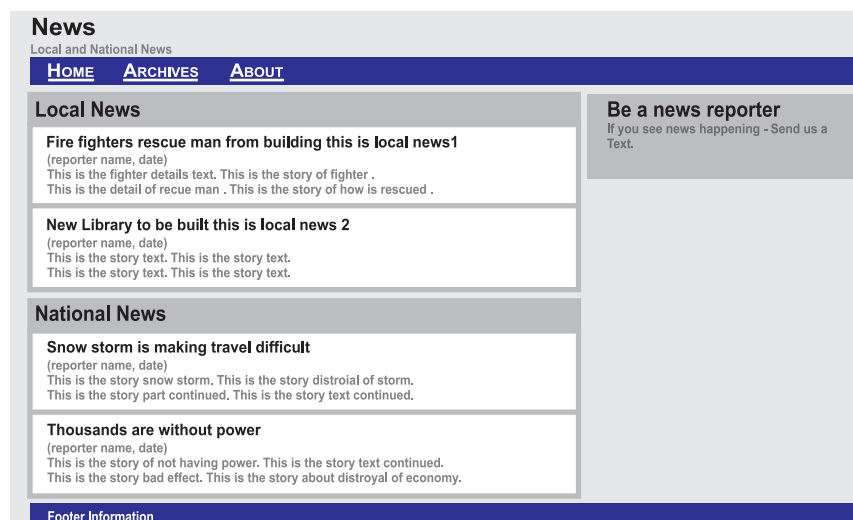Time - 09:30 am
Seat no – B39
Destination - Delhi
Both pages should be interlinked. Create external stylesheet with relevant tags.

SOP 4 : **Creation of website using HTML5 and CSS.**

Create a webpage as given layout use <nav>,<header>,<footer>,<aside>,< article> with CSS.

SOP 5 : **Use of Audio on web pages using HTML5.**

Create a webpage named audio.html to set an audio file in webpage with controls such that it uses HTML5 elements. The audio file must play as soon as the webpage loads in browser and it will start over again, every time when it is completed.

Create another webpage named audio1.html which provides multiple source file formats for the same audio file that plays a sound automatically with controls. The browser should display the message with appropriate attribute when audio file is not supported by browser. The code must incorporate the list of sound files formats (like wav, MP3 or ogg etc).

SOP 6 : **Use of video on webpages using HTML5.**

Create a webpage named video.HTML to display a video file on webpage and plays automatically with controls. The dimension of video area should be 150 * 150 pixels.

Create another webpage which provide multiple source file formats for the same audio file that plays a sound automatically with controls. The dimension of video area should be 100* 100 pixels. The browser should display the message with appropriate attribute when audio file is not supported by browser. The code must incorporate the list of video files formats (like webM, MP4 or ogg etc).

SOP 7 : **Navigation on an image using Client side image Mapping in web page using HTML5.**

➢ Create a webpage named imagemap. html with an inserted image having jpeg, png or gif extension. Create 3 different shapes (like rectangle, circle and polygon) which do not overlap. Note the co-ordinates making use of Ms-Paint/GIMP/IrfanView/Pinta. Each shape should be mapped or navigatea with different URL that should navigate to a local webpage.

❑❑❑

2. Basics of Audio editing (Audacity)

SOP 1 : **Recording environmental sounds.**

You are supposed to record the environmental sounds using an audio recorder. You can record at least 10 such sounds example. Scenarios are given below, you can choose to record anything from given list below.

➢ Children's playing in the playground.

➢ A busy market.

➢ Bus stop.

➢ Railway station.

➢ After performance applause.

➢ Typing sound from a keyboard

➢ Animals sound eg. dog barking, cat meowing etc.

Can you explain where all such sounds will be used ?

SOP 2 : **Removing the noise from the sound clip.**

Record the audio of a group discussion, meeting or class lecture. Using filters, with additional equalization, try to remove as much of the background noise from the recording as possible. Do it without making the voice look like it is processed or unnatural.

Some noises may be widespread and very difficult to remove. Use High-pass, Low-pass, notch filters and noise filters to remove the noise.

Test the quality of the edited sound with the original music. Submit a new file to your teacher. Explain the use of the filters you have used?

SOP 3 : **Recording narration.**

All of us have role models in our life. You get inspired by their life story. Suppose you are given a task to make a documentary film on your role model and you need to make a narration in the video clip. Gather information and make your story ready, and record your audio so that it can be used with the video.

Things to take care while making audio recordings:

➢ Rehearse the vocal delivery of your story.

➢ Be sure the sound is clean no extraneous noise, time intervals, unwanted sounds, hiss, or distortion.

➢ Take pauses at appropriate Places Edit the clip if such things are present in the audio.

➢ Select the proper background music to the audio clip, your sound must be clear to listen.

You can email the output file with your details to your teacher.

Example clip, search on youtube for Dr. APJ Abdul Kalams Biography in Hindi By Gulzar Saab; Motivational Story. Similar kind of audio clip you can make.

Link : https://www.youtube.com/watch?v=LrdrcP2oiyU

SOP 4 : **Creating sound stories.**

Pick up any story which you like. It may be in your languages like Marathi, Hindi or any other. Rehearse with vocal delivery, multiple times and record the story and then

SOP 5 : **Record sound for slides presentation.**

You are required to prepare a presentation on any advance upcoming topic in IT field and then record its delivery using audio recorder.

This recording can be then used to understand points which are required to improve your delivery style. Add all the required sound effects like, scary sound, happy music as based on the situationn in the story. You can collect all such stories and publish on your own school's website or youtube.

❑❑❑

3. Basics of Video editing (Kdenlive)

SOP 1 : **Collect the pictures of your issues or problems from your area and then make a video slide show with following requirements.**

➢ Select Suitable background music for the entire duration of the slide shows.

➢ Provide appropriate suitable title in the beginning, provide subtitles to the pictures which describes the image.

➢ Choose transitions between the photos.

➢ Provide proper credits at the end of video.

➢ Submit this video to your teacher.

SOP 2 : Make an exclusive video with all the memories and best pictures of your friend and present him as a gift. Video can include the images, Videos, birthday wishes etc.

SOP 3 : Create a video demonstrating the college achievements in the last year. Following are some of the points you can consider while creating a video.

When editing video cutaways, it's typically easier to edit all of the audio first, then work on video replacements. By contrast, when adding narration to a video, it's best to edit the video first, then synchronize the audio. Since you know the precise lengths of the video clips, you can match the audio by using a combination of rehearsed narration and audio editing.

This exercise should acquaint you with basic techniques for recording and synchronizing audio with a finished video:

❏ Rehearsing a narrative script to achieve a close-to-sync audio recording that will minimize later editing.

❏ Setting up a typical audio editing program for recording.

❏ Coordinating three or more software programs simultaneously during audio recording.

❏ Basic time-based editing of audio files.

❏ Merging audio and video tracks.

❏❏❏

4. Open Street Map (OSM)

SOP 1 : Log in to Open Street Map. Browse the map and find any un-mapped area. Identify and mark the area and give it appropriate tag. Practice with few more objects. Upload your changes from your account.

SOP 2 : Find out a garden, library, cafe, hospital, departmental store, chemist etc. in your neighborhood. These places generally have opening hours or entry is restricted during certain hours. Find out the correct opening hours.

Tag the place if it is not already done and enter the opening hours in the proper format in Open Street Map.

SOP 3 : Locate your friend or relative's residence or your native place which is far away from your home. Ensure that it has not been tagged on OSM. After you add the location, email or telephone or message and ask to verify that it can be searched and located on OSM. Hence it would help the travelers in future who use OSM.

SOP 4 : On OSM, choose any small town or village in Maharashtra or from other state or anywhere in the world, preferably not covered by volunteer mappers. Complete all buildings, roads etc. By dividing the work among all the students of the class. Write your experience of collaboration in your own words.

□□□

Sample SEO Report

Your Agency Limited
555 9999
enquiries@youragency.com
youragency.com

Your Agency

Website Report for test.com

This report grades your website on the strength of a range of important factors such as on-page SEO optimization, off-page backlinks, social, performance, security and more. The overall grade is on a A+ to F- scale, with most major industry leading websites in the A range. Improving a website's grade is recommended to ensure a better website experience for your users and improved ranking and visibility by search engines.

test.com's Result

C+
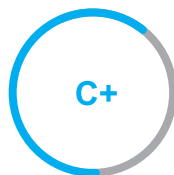
Your page could be better

You have 15 Improvements Recommended
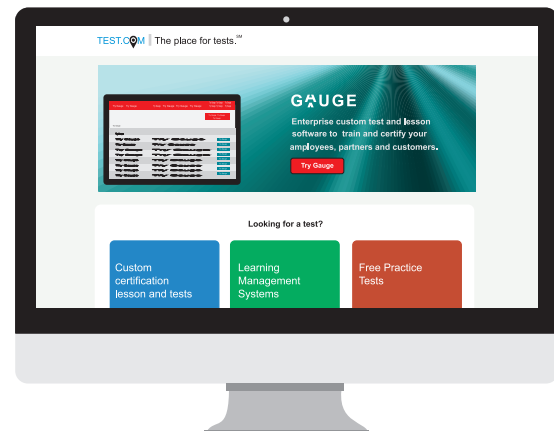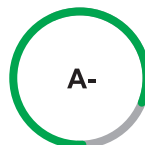
D+	A+	A-	D-	A+
SEO	Usability	Performance	Social	Security

SEO
Social — Performance
Security — Mobile & UI

SEO Results

D+
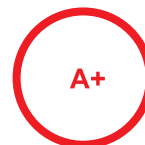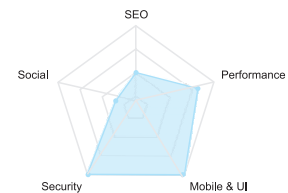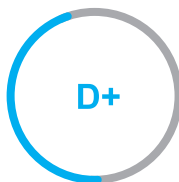
Your SEO could be better

Your page has some level of optimization but could be improved further. SEO optimization is important to ensure you can maximize ranking potential and drive traffic to your website from search engines. You should ensure you page fulfils common recommended improvements outlined here before moving onto more advanced SEO strategies.

HTML HEADER

Title Tag ✖

Your page does not appear to have a title tag. Title tags are very important for search engines to correctly understand and categorize your content.

Meta Description Tag ✖

Your page appears to be missing a meta description tag. A meta description is important for search engines to understand the content of your page, and is often shown as the description text blurb in search results.

BODY CONTENT

Header Tags ✖

Your page is not making effective use of header tags.

HTML header tags are an important way of signaling to search engines the important content topics of your page, and subsequently the keywords it should rank for.

Header Tag   **Frequency**

H1   0
H2   0
H3   0
H4   0
H5   0
H6   0

Keyword Consistency ✖

Your page's main keywords are not distributed well across the important HTML tags.

Your page content should be focused around particular keywords you would like to rank for. Ideally these keywords should also be distributed across tags such as the title, meta and header tags.

Keyword	Title	Meta Description Tag	Headings Tags	Page Frequency	
browser	☐	☐	☐	2	
site	☐	☐	☐	1	
requires	☐	☐	☐	1	
javascript	☐	☐	☐	1	

Keyword	Title	Meta Description Tag	Headings Tags	Page Frequency	
cookies	☐	☐	☐	1	
enabled	☐	☐	☐	1	
please	☐	☐	☐	1	
change	☐	☐	☐	1	
settings	☐	☐	☐	1	
upgrade	☐	☐	☐	1	

Amount of Content ✖

Your page has a low volume of text content which search engines can interpret as 'thin content'. It has been well researched that higher text content volumes are related to better ranking ability in general.

Word Count: 18

Image Alt Attributes ✓

You do not have any images missing ALT attributes on your page.

LINKS

Number of Backlinks ✓
You have a strong level of backlink activity to this page.

160761	318789	77
External Backlinks	All Backlinks	Moz Domain Authority

On-page Link Structure *i*
We found 0 total links. 0% of your links are external links and are sending authority to other sites. 0% of your links are nofollow links, meaning authority is not being passed to those destination pages.

Broken Links ✓
We have not detected any broken links on your page.

Friendly URLs ✓
Your page links appear friendly (easily human or search engine readable).

OTHER

Robots.txt ✓
Your website appears to have a robots.txt file.

http://test.com/robots.txt

XML Sitemaps ✖

We have not detected or been able to retrieve a XML sitemaps file successfully.

A sitemap includes a list of your pages that are available for crawling,
as well as other useful

information for search engines such as last update times and priority of pages. Sitemaps are recommended to ensure that search engines can intelligently crawl all of your pages.
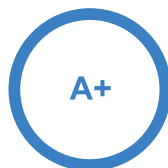
Analytics ✖

We could not detect an analytics tool installed on your page.

Website analytics tools like Google Analytics assist you in measuring, analyzing and ultimately improving traffic to your page.

Usability

A+

Your usability is very good!

Your page is highly usable across devices. Usability is important to maximize your available audience and minimize user bounce rates (which can indirectly affect you search engine rankings).

Device Rendering *i*

This check visually demonstrates how you page renders on different devices. It is important that your page is optimized for mobile and tablet experiences as today the majority of web traffic comes from these sources.
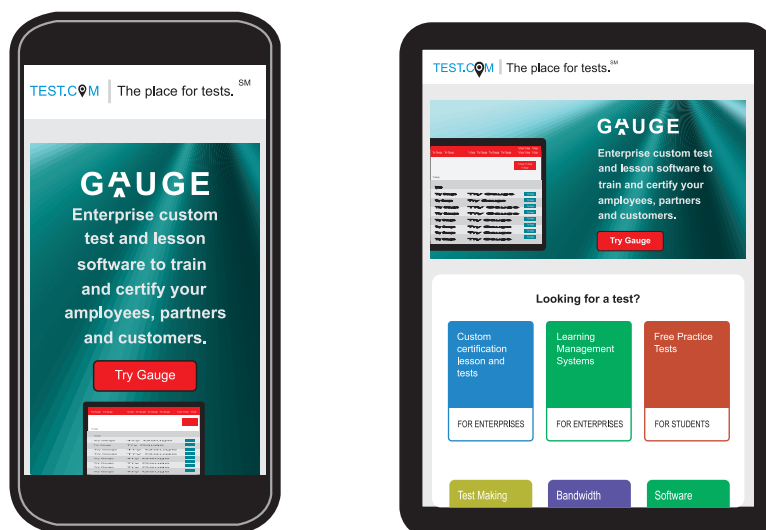
Use of Mobile Viewports ✓

Your page specifies a viewport matching the device's size, allowing it to render appropriately across devices.

Flash Used? ✓

No Flash content has been identified on your page.

iFrames Used? ✓

There are no iFrames detected on your page.
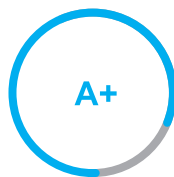
Favicon ✓

Your page has specified a favicon.

Legible Font Sizes ✓

The text on your page appears to be legible across devices.

Tap Target Sizing ✓

The links and buttons on your page appear to be appropriately sized for a user to easily tap on a touchscreen.

Performance Results

A+

Your performance is very good!

Congratulations, your page has performed very well in our testing meaning it should be reasonably fast and responsive for users. Performance is important to ensure a good user experience, and reduced bounce rates (which can also indirectly affect you search engine rankings). Continue to monitor your performance over time to ensure there are no periodic fluctuations.
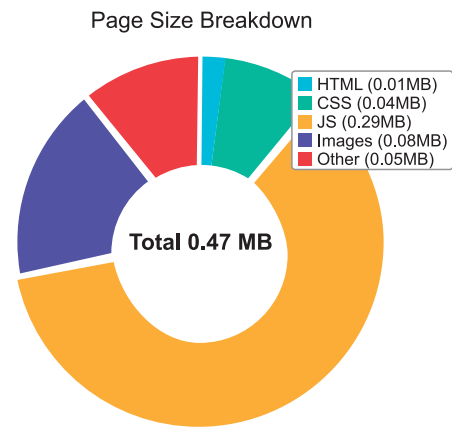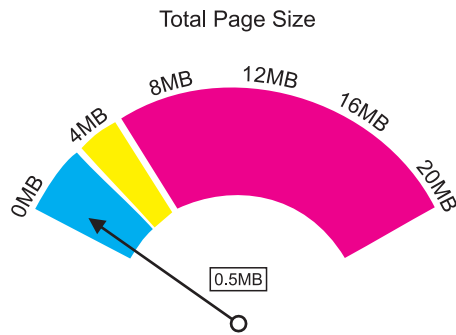
Page Speed Info ✓

Your page's server response time is reasonably low which is good for load speed and user experience.
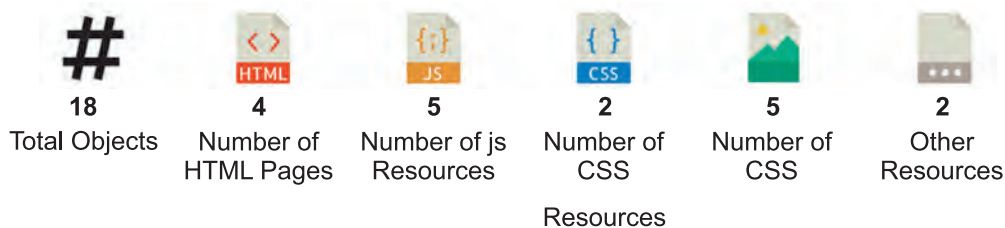
Server Response	All Page Content Loaded	All Page Scripts Complete
0.27s	5.2 s	2.7s
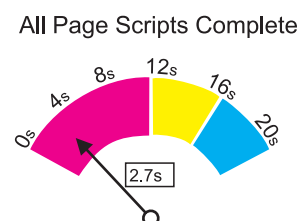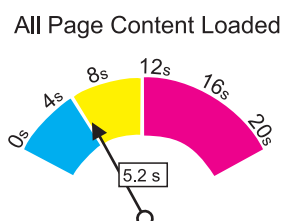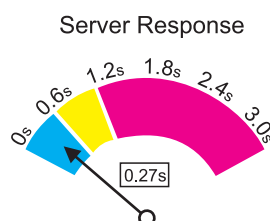
Page Size Info ✓

Your page's file size is reasonably low which is good for Page Load Speed and user experience

Total Page Size

8MB 12MB

4MB

16MB

0MB

20MB

0.5MB

Page Size Breakdown

HTML (0.01MB)
CSS (0.04MB)
JS (0.29MB)
Images (0.08MB)
Other (0.05MB)

Total 0.47 MB

Number of Resources   *i*

This check displays the total number of files that need to be retrieved from web servers to load your page. As a general rule, having more files to retrieve increases the number of server requests and can subsequently increase page load time. It is a good idea to removing unneccessary files or consolidate files like styles and scripts where possible.

18	**4**	**5**	**2**	**5**	**2**
Total Objects	Number of HTML Pages	Number of js Resources	Number of CSS Resources	Number of CSS	Other Resources

JavaScript Errors ✔

Your page is not reporting any JavaScript errors.

GZIP Compression ✔

Your website is using GZIP compression.

Optimize Images ✖

Your page appears to include images which are poorly optimized. Properly formatting and compressing images can have a significant impact on page load performance.

Minification ✔

All your JavaScript and CSS files appear to be minified.

W3C Validity ✖

Your page does not appear to be W3C compliant. W3C compliance ensures the use of modern standards and improves the likelihood of your page rendering appropriately in future browser versions.

Errors: 5
Warnings: 3

Deprecated HTML ✔
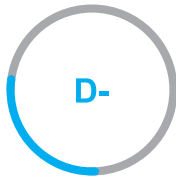
No deprecated HTML tags have been found within your page.

Inline Styles ✔

No inline styles have been found within your page's HTML tags.

Social Results

D-

Your social needs improvement

You appear to have a weak social presence or level of social activity (or we may just not be able to see your profiles!). Social activity is important for customer communication, brand awareness and as a marketing channel to bring visitors to your website. We recommend that you list all of your profiles on your page for visibility, and begin to build a following on those networks.

Facebook Connected ✖
No associated Facebook Page found as a link on your page.

Twitter Connected ✖
No associated Twitter profile found as a link on you r page.

Twitter Connected ✖
No associated Google+profile found linked on your page.

Twitter Connected ✖
No associated Instagram profile found linked on your page.

Twitter Connected ✖
No associated Youtube channel found linked on your page.

Twitter Connected ✖
No associated LinkedIn profile found linked on your page.

Social Shares ✔
Your page appears to be being shared on social networks.

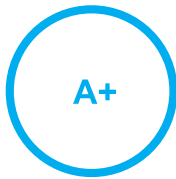| **621543**	**0**	**4911**	**7344**
Facebook	LinkedIn	Pinterest	Stumbleupon

Your security looks very good!

We haven't identified obvious security problems on your website. Security is important to ensure your website protects user data, doesn't become compromised or experience downtime or data loss. We recommend ongoing patching and the continuous use of protective monitoring tools.

A+

SSL Enabled

Your website has SSL enabled.

HTTPS Redirect

Your page successfully redirects to a HTTPS (SSL secure) version.

Malware Check

Your website has been flagged as safe by popular malware scanners

Google Safe Browsing   McAfee   Norton by Symantec   AVG.

Critical Software Up To Date

No outdated software versions were identified on you server.

Email Privacy

No email addresses have been found in plain text on you page.

Technology List   *i*

These software or coding libraries have been identified on
your page.

	Technology	Version
	Google Analytics	UA
	Google Tag Manager	
	ZURB Foundation	
	jQuery	

Server IP Address   *i*

69.172.200.235

DNS Servers   *i*

ns65.worldnic.com
ns66.worldnic.com

Web Server   *i*

nginx/1.13.12

Charset   *i*

text/html

Recommendations

SEO	Add a title tag (ideally between 10 and 70 characters)	High Priority
SEO	Include a meta description tag	High Priority
SEO	Use your main keywords across the important HTML tags	Medium Priority
SEO	Implement a XML sitemaps file	Medium Priority
Social	Create and link your Facebook Page	Medium Priority
SEO	Make greater use of header tags	Medium Priority
Performance	Ensure your page is W3C compliant	Low Priority
SEO	Increase Page text content	Low Priority
Performance	Optimize your images to reduce their file size	Low Priority
SEO	Implement an analytics tracking tool	Low Priority
Social	Create and link your Twitter profile	Low Priority
Social	Create and link an associated Google+ profile	Low Priority
Social	Create and link associated Instagram profile	Low Priority
Social	Create and link an associated Youtube channel	Low Priority
Social	Create and link an associated LinkedIn profile	Low Priority

Career Opportunities

Cloud Computing Engineers

Basic Requirements :

Cloud engineers typically have at least a bachelor's degree in **computer** science or information technology. Those in the field often have years of software development experience, working with a variety of programming languages such as Java, Angular JS, C++, and Python.

Cloud computing engineers define, design, build, and maintain systems and solutions leveraging systems and infrastructure managed by cloud providers such as Amazon Web Services (AWS) and Microsoft Azure. Following are some of job roles in the cloud computing domain.

- Cloud Architect
- Cloud Consultant
- Cloud Product and Project Manager
- Cloud Services Developer
- Cloud Software and Network Engineer
- Cloud System Administrator
- Cloud System Engineer

Computer Network Specialists

Basic Requirements :

Computer network specialists and analysts define, design, build, and maintain a variety of data communication networks and systems. They typically have a bachelor's degree in computer science or a related field. Some also have a master's degree in business administration (MBA), with a focus on information systems. Network related jobs and projects. The job profiles are as-

- Computer and Information Research Scientist
- Computer and Information Systems Manager
- Computer Network Architect
- Computer Systems Analyst
- Computer Systems Manager
- IT Analyst
- IT Coordinator
- Network Administrator
- Network Architect
- Network and Computer Systems Administrator
- Network Engineer
- Network Systems Administrator
- Senior Network Architect
- Senior Network Engineer
- Senior Network System Administrator
- Telecommunications Specialist

Computer Support Specialist

Basic Requirements :

The computer user support specialist must be knowledgeable about the functioning of a computer system. Some of the employers appoint the technicians on the basis of an associate's degree or

postsecondary classes, while others prefer the applicants to have a bachelor degree.

Computer support specialists and network administrators help computer users and organizations. Some of these workers support computer networks by testing and evaluating network systems and ensuring that the day-to-day operations work. Others provide customer service by helping people with their computer problems. Some require a bachelor's degree, while others need an associate degree or post-secondary classes. They work as-

- Customer Support Administrator
- Customer Support Specialist
- Desktop Support Manager
- Desktop Support Specialist
- Help Desk Specialist
- Help Desk Technician
- IT Support Manager
- IT Support Specialist
- IT Systems Administrator
- Senior Support Specialist
- Senior System Administrator
- Support Specialist
- Systems Administrator
- Technical Specialist
- Technical Support Engineer
- Technical Support Specialist

Database Administrator

Basic Requirements :

Many employers prefer database administrators with at least a bachelor's degree in computer science or a related field. In some cases, a master's degree is required for higher-level positions. A bachelor's degree program is a 4-year program and is a prerequisite to a 2-year master's degree program.

Database administrators help store and organize data or companies and/or customers. They protect the data from unauthorized users. Some work for companies that provide computer design services. Others work for organizations with large database systems, such as educational institutions, financial firms and more. They can be employed as-

- Data Center Support Specialist
- Data Quality Manager
- Database Administrator
- Senior Database Administrator

Information Technology Leadership

Basic Requirements :

Obtain a bachelor's degree in computer science or information technology. Develop IT and leadership experience in a variety of IT roles, from entry-level support positions to IT manager. Most IT director positions require 10 years of experience. Earn your master's degree.

Leadership in IT draws from candidates with strong technology backgrounds and superior management skills. They have experience in creating and implementing policies and systems to meet IT objectives, and the ability to budget the time and funds necessary.

- Chief Information Officer (CIO)

- Chief Technology Officer (CTO)
- Director of Technology
- IT Director
- IT Manager
- Management Information Systems Director
- Technical Operations Officer

Information Security Specialist

Basic Requirements :

Hiring managers for IT security specialist positions generally require at least an undergraduate degree (associate or bachelor) in information security, computer information systems, network security, computer science or a related field of study.

The increased incidence of security breaches and the associated danger of identity theft has enhanced the importance of protecting data on commercial and governmental sites. Information securities analysts help defend an organization's computer network and computer systems. The job roles offered to them are-

- Information Security
- Security Specialist
- Senior Security Specialist

Software/Application Developer

Basic Requirements :

Most computer software development jobs require bachelor's degrees in computer science or software engineering. These programs have significant math requirements that include a sequence in calculus, differential equations, and linear algebra. A sequence in physics is also required.

Software developers design, run, and test various computer programs and applications. Application Developers create new applications and code solutions. They usually have a bachelor's degree in computer science or a related field. They also have strong programming skills, so can be employed as-

- Application Developer
- Applications Engineer
- Associate Developer
- Computer Programmer
- Developer
- Java Developer
- Junior Software Engineer
- .NET Developer
- Programmer
- Programmer Analyst
- Senior Applications Engineer
- Senior Programmer
- Senior Programmer Analyst
- Senior Software Engineer
- Senior System Architect
- Senior System Designer
- Senior Systems Software Engineer
- Software Architect
- Software Developer
- Software Engineer
- Software Quality Assurance Analyst
- System Architect

- Systems Software Engineer
- Mobile Application Developer

Web Developer

Basic Requirements :

Many employers prefer prospective Web developers to hold a bachelor's degree in computer science or a related field. Coursework often includes programming, database management, mathematics, Web design and networking.

Web developers design, create, and modify websites. They are responsible for maintaining a user-friendly, stable website that offers the necessary functionality for their client's needs. Some jobs require a bachelor's degree, while others need an associate degree, including classes in HTML, JavaScript, or SQL. This education can help to get employment as-

- Front End Developer
- Senior Web Administrator
- Senior Web Developer
- Web Administrator
- Web Developer
- Webmaster
- UX Designer

Professional certificate courses like RHCE, ORACLE, Software Testing etc. can be done to enhance the career opportunities.
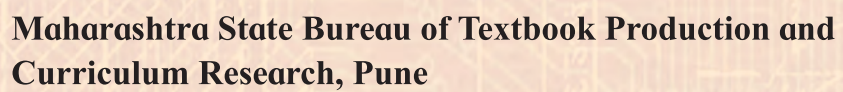
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Notes

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