

# Web Technology (BCS-502)

- Web Technology [AKTU-2020-21]
- Web Development Strategies
- History of Web
- Internet
- Protocol Governing Web [AKTU-2020-21]
- Writing a Web Projects

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## • Web - Technology :- [AKTU - 2020-21]

- Web technology is a mechanism by which computers communicate with each other. It provides higher and faster mutual device communication.

### Introduction :-

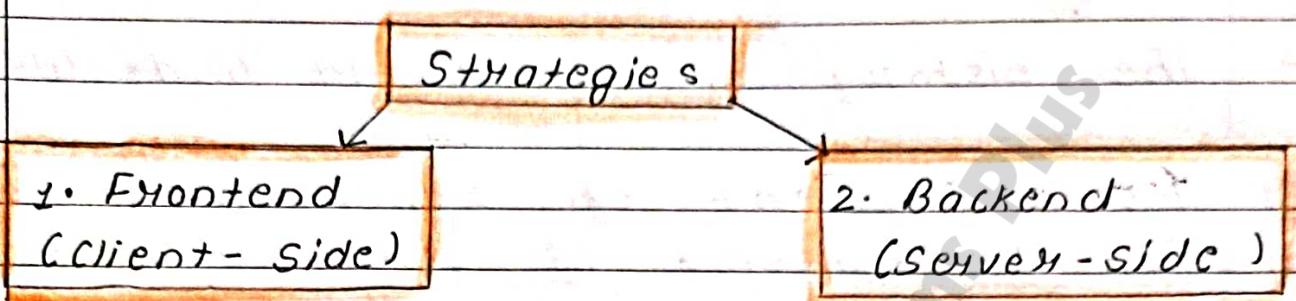
- Web Technology refers to the tools and techniques used to create websites that run on the internet.

### It includes :-

1. web Browsers :- Program like chrome or Firefox that let you view websites
2. HTML (Hyper text markup Language).
3. CSS (Cascading Style Sheets)
4. Javascript
5. Web Servers :- Computers that store websites and send them to your browser when you visit a site

### # Web Development Strategies

Web development Strategies are the approaches or plans used to create effective and user-friendly websites.



### 1. Frontend (Client-side)

- The Frontend is everything you see and interact with on a website.
- Includes:- Text, Images, button, menus etc
- Languages:- HTML, CSS, Javascript.

### 2. Backend (Server-side)

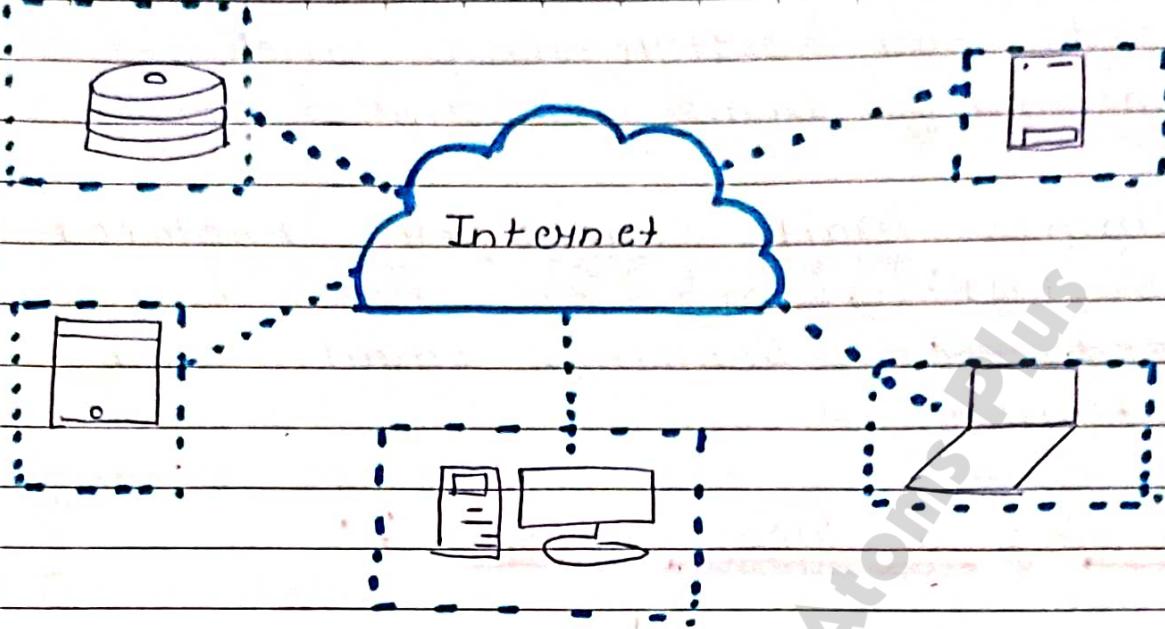
- The backend is the behind the scenes part of the website. It's where the website's data is stored, processed, and managed.
- Includes:- Servers, databases
- Languages:- Python, PHP, MongoDB, MySQL

## History of Web :-

- Sir Tim Berners-Lee invented the World Wide Web in 1991
- The history of the World Wide Web
  - ① The development of hypertext
  - ② The development of Internet Protocol
- In 1975, Alan Kay produces the First Personal Computer
- Berners-Lee developed the first web browser and web server software in 1990, and by 1991 the first web page was created.

### Internet :-

- The Internet is a global network of computers that are connected to each other, allowing people to share information, communicate, and access websites.
- Web that connects phones, computers and other devices so they can "talk" to each other like message, videos and pictures.



## Protocol Governing web [AKTU - 2020-21]

1. Hypertext Transfer Protocol (HTTP)
  - Foundation of data communication on the web.
  - Less Secure
2. Hypertext Transfer Protocol Secure (HTTPS)
  - It is more Secure Version of HTTP
3. File Transfer Protocol (FTP):
  - Used for transferring files between computers over the internet
4. Post Office Protocol (POP):-
  - Used for retrieving email from a mail server.
5. Internet Message Access Protocol (IMAP):

→ Used for retrieving and managing email messages

6. Simple Mail Transfer Protocol (SMTP):

→ Used for sending email over Internet

## Writing a Web Project



Define Your Project Idea



Plan Your Project



Choose Your Tools



Start Coding



Test Your Website

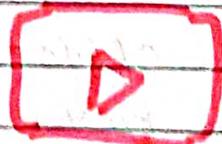


Deploy Your Website



Get Feedback & Improve

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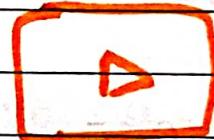


## UNIT-01 (LEC- 02)

# Web Technology (BCS-502)

- Connecting to Internet.
- Introduction to Internet Services and tools.
- Introduction to client - server Computing.

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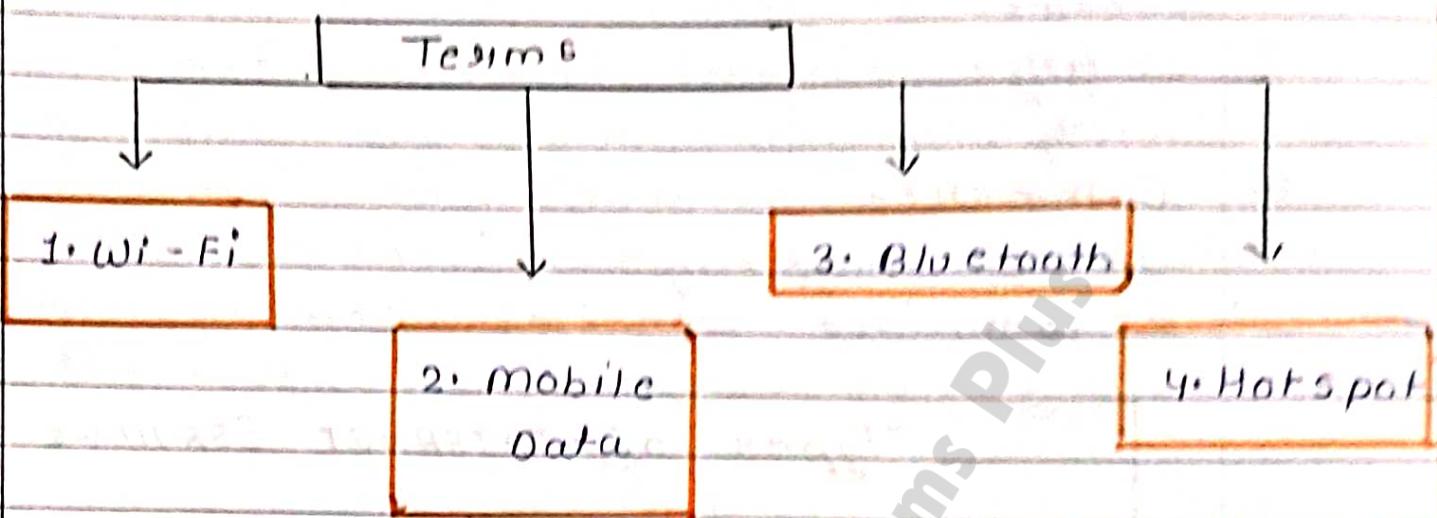


## Connecting to Internet

"Connecting to Internet" means establishing a communication link between a device and a network of interconnected computers and servers to access and exchange information using Web protocols.

### What happens?

- When a device connects to the internet, it communicates with a large network through a ISP (Internet Service Provider).
- Internet is hierarchy structure of network that allows connection of two internet connected devices both being at different geographical locations.
- Every computer that is connected to internet has a unique address (IP address → IP → Internet Protocol)



## Introduction to Internet Services :

- Internet Services allows us to access huge amount of information such as text, graphics, sound over the Internet
  - Internet Services refers to the various types of services that can be accessed and utilized through the internet
1. Access Information  
 → Website  
 → Online libraries
2. Communicate  
 → Email, WhatsApp  
 → Zoom
3. Entertainment

→ Netflix

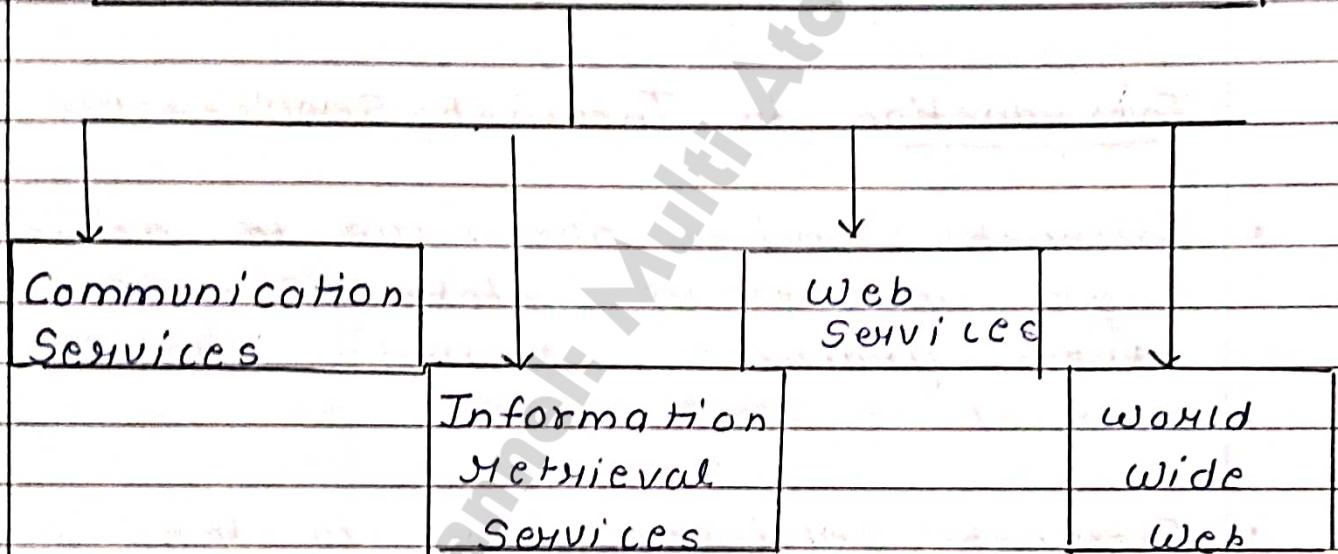
→ YouTube

4. Commerce

→ Online shopping

→ E-commerce websites

### Types of INTERNET SERVICES



#### 1. Communication Services :-

These Services Offer exchange of information with individuals or Groups

like → E-mail

#### 2. Information Retrieval Services :-

Offering easy access of information present on the internet  
like → FTP (File Transfer Protocol)

3. Web Services :- Web Services are Software Systems that allow different application systems or organizations to communicate & exchange data over the internet.

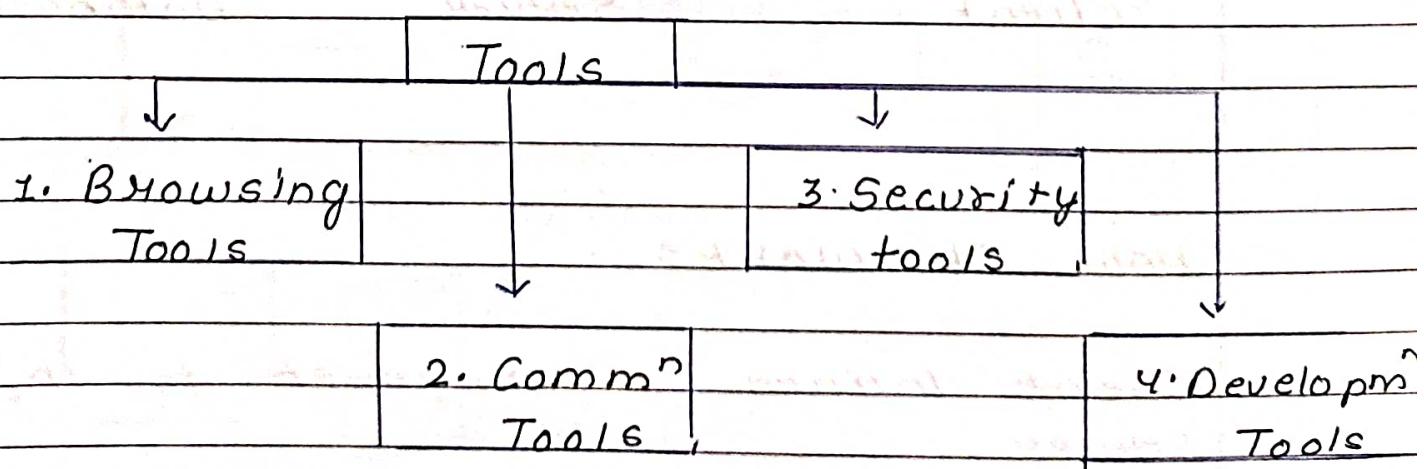
Like → AWS, Google maps API, weather API

4. World wide web (www) :- www refers to services provided through the web enabling users to access, share and interact with information online.

- Access Information
- Communicate
- Conduct business
- Learn.

### Internet tools :-

Internet tools are software app's that enable users to utilize the internet efficiently.



## Browsing Tools

1. Web browsers (Chrome, Safari)
2. Search engines (Google, Yahoo)

## Communication Tools

1. Email Clients (Gmail)
2. Video Conferencing Soft (Zoom)

## Security Tools

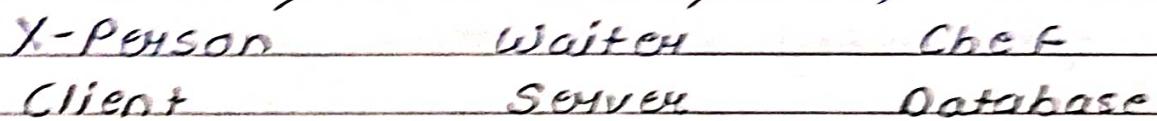
1. VPNs (Virtual Private Network)
2. Antivirus Soft (Norton)

## Development Tools

1. Code editors (VS code)
2. Version Control System (git, SVN)

## Client-Server Computing

### Restaurant



### How It Works :-

1. Client Initiate a request to the SERVER

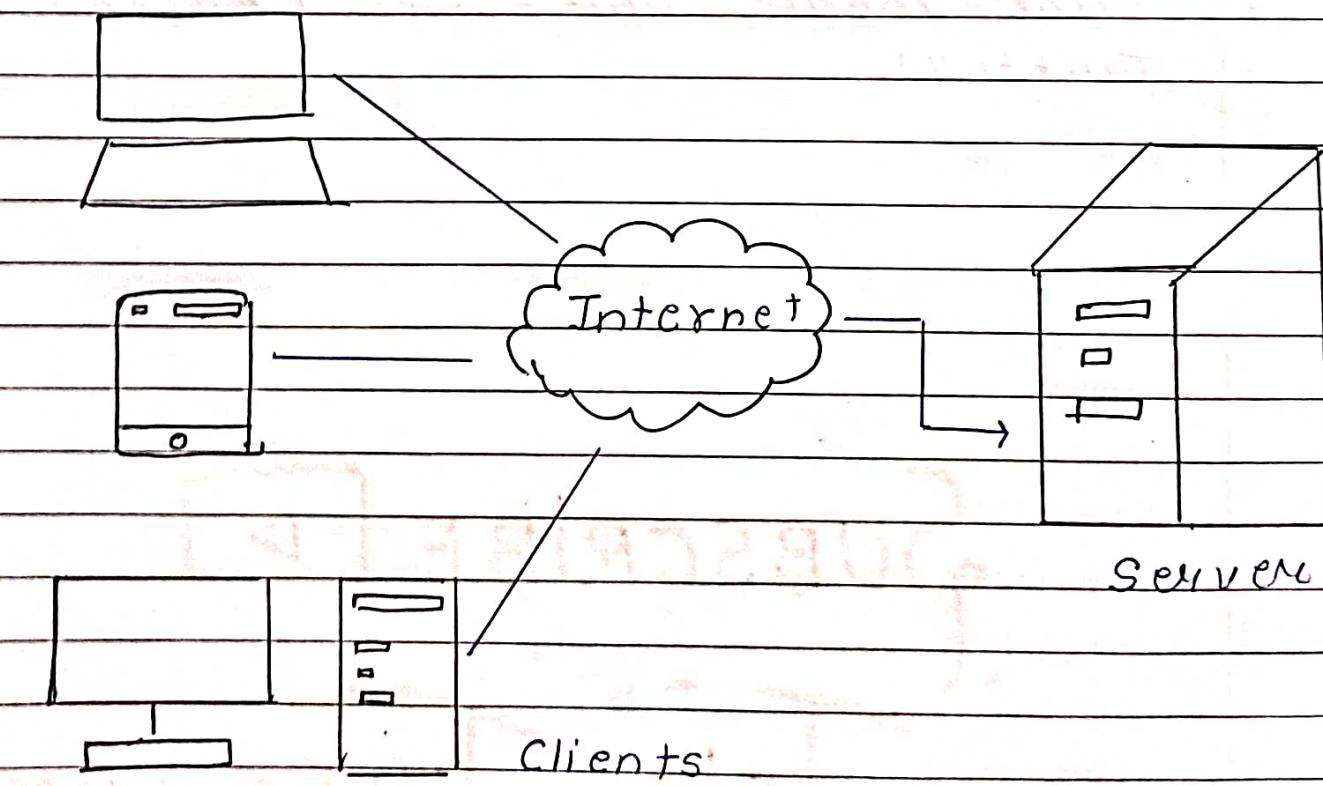
Date : \_ / \_ / \_

- 2 Server processes the request and sends a response.
- 3 Client receive the processes the response.

### Types of Client-Server models.

- 1 One-tier architecture
- 2 Two-tier architecture
- 3 Three-tier architecture
- 4 N-tier architecture

Client Server Computing is a way of communication b/w the client and the server, which works as a request & response.



### Advantages :

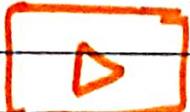
- Shared resources
- Improve Security
- Better Performance

### Disadvantages :

- Security risks
- Complexity
- Cost

### Examples of Client-Server Application

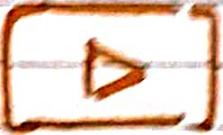
- Web - browser (Chrome, Firefox)
- Email Client (Gmail)
- Social media platforms (Facebook, Twitter)

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# UNIT-01 (LEC-03)

- HTML
- HTML Tags
- Tables
- Forms [OK TO 2021-22, 22-23]
- Lists in HTML

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## HTML :-

- HTML Stands for HyperText Markup Language. It is the basic building block of the web, and it's used to create and structure web pages and their content.

### Why HTML is important :

- Structure :- HTML is what gives structure to a webpage, organizing headings, Paragraph, images.
- Easy to Learn :- HTML is simple and user-friendly
- Universal Language :- Every website you visit is built using HTML.

| Year | Event                        |
|------|------------------------------|
| 1989 | Tim-Berners-Lee Proposed www |
| 1991 | First Version of HTML        |
| 1993 | Mosaic browser make web      |
| 1995 | HTML 2.0 is released         |
| 1997 | HTML 3.2                     |
| 1999 | HTML 4.01                    |
| 2008 | HTML 5                       |
| 2014 | HTML5 is finalized           |

## HTML Tags :-

HTML Tags are like keywords which define that how web browser will format and display the content.

- Heading Tag :-

`<h1> . . . </h1>`

`:`

`<h1>`

`</h1>`

`<h2> . . . </h2>`

- <br> Tag :-

`br` Stands for break line

- <img>:- It is used to insert image.

- <li>:- It is used to represent items in list.

- <p>:- It represents a paragraph

- <table>:- Used to create table

- <i>:- Italic text.

- <b>:- Used for bold text.

## HTML Table :-

Date : \_ / \_ / \_

A table in HTML consists of table cells inside rows and columns

Ex:-

<table>

<tr> <th> Company </th>

<th> Contact </th>

<th> Country </th>

</tr>

<tr>

<td> XYZ </td>

<td> XYZ </td>

<td> Germany </td>

|   |   |   |
|---|---|---|
| - | - | - |
| - | - | - |
| - | - | - |

| Com | Cont | Country |
|-----|------|---------|
| XYZ | XYZ  | GER     |
| XYZ | XYZ  | DEU     |

</tr>

<tr>

<td> XYZ </td>

<td> XYZ </td>

<td> USA </td>

</tr>

</table>

td :- Stand For Table Data

tr :- Stand For Table Row

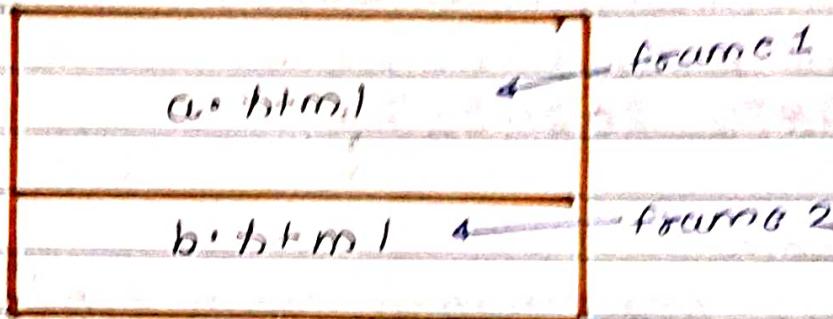
th :- Define a header cell in a table

Frames :-

- It can display one or more than one HTML document in the same browser window.

Each HTML document is called FRAME and each frame is independent of others.

Frame > tag is used divide browser.



Attribute of Frame Tag :-

- Row    ' border color'
- Column    ' Frame border'
- Name

### Forms In HTML:

An HTML Form is used to collect user input. The user input is most often sent to a SERVER for processing.

Tag :- `<form>`

`</form>`

`<label for="frame"> First name: </label> <br>`  
`<input type="text" id="frame">`

O/P :- First name:

Date : \_\_\_ / \_\_\_ / \_\_\_

Qn-01 Create a HTML code to create a Webpage that contains the User registration form with following details Username , user date of birth , user address , user gender , user email , user mobile number .

[AKTU - 2021-22]

```
<body>
<h1> Registration Form </h1>
<form>
<label for="username"> Enter your Name </label>
<input type="text" id="username">
<br> <br>
<label for="date"> Enter Your DOB </label>
<input type="date" id="date">
<br> <br>
<label for="address"> Enter Your Address </label>
<input type="text" id="address">
<br> <br>
<label for="selector"> Choose Gender </label>
<select name="gender" id="selector">
<option value="male"> male </option>
<option value="female"> female </option>
<option value="other"> Other </option>
</select>
<label for="email"> Enter Your Email </label>
<input type="text" id="email">
<label for="mob_no"> Enter Your No </label>
<input type="text" id="mob_no">
</form>
</body>
```

List :-

An HTML List is a record of related information used to display the data or any information on web pages in Ordered or Unordered form.

Types of List :-

1. Unordered List :- An unordered list starts with `<ul>` tag. Each list items `<li>` tag

For - ex :- `<ul>`

```
<li> Coffee </li>
<li> Tea </li>
</ul>
```

- Coffee
- Tea

2. Ordered List :- An ordered list starts with `<ol>` tag. Each list items start with the `<li>` tag

For - ex :- `<ol>`

```
<li> coffee </li>
<li> Tea </li>
</ol>
```

1. Coffee
2. Tea

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# UNIT-01 (LEC-04)

- DTD [AKTU - 2021-22, 2022-23]
- XML Schemas [AKTU - 2021-22]
- XML Parsers
- Object models
- DOM
- SAX

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BY MAYUR SHIVAM

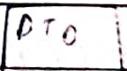
## XML DTD :- [AKTU-2021-22, 2022-23]

- XML Stand For Extensible Markup Language
- XML Document Type Definition
- Used to describe XML language precisely
- Used to define structure of a XML document
- Contains list of legal elements
- Used to perform Validation.
- A Document Type Definition describes the tree structure of a document and something about the data

### Purpose of DTD :-

- Its main purpose is to define the structure of an XML document
- It contains a list of legal elements and defines the structure with their help of them.

### Types Of DTD



1. Internal DTD
2. External DTD
3. Internal DTD :-

- An internal DTD is defined within the XML document itself, by using the `<!DOCTYPE>` declaration
- The DTD is contained within the angle bracket of the `<!DOCTYPE>` declaration, and is placed before the root element of the document

### Syntax (Internal DTD)

```

<!DOCTYPE root-element [
  <!ELEMENT root-element (child-element)*>
]>

<root-element>
  <child-element> Some Text <!child element>
</root-element>
  
```

### External DTD :

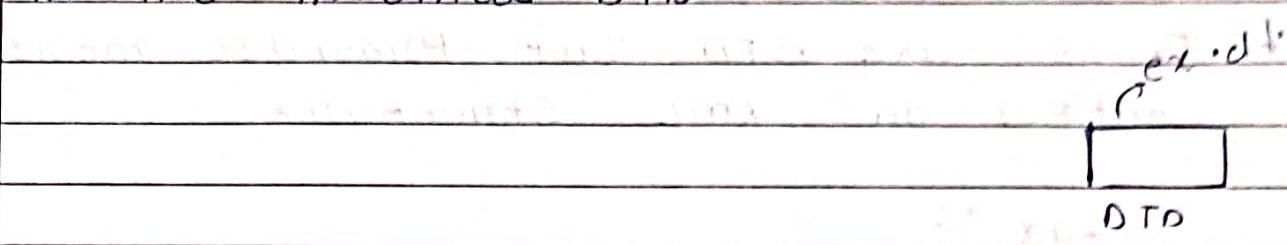
- An External DTD is defined in a separate file and its referenced by the XML document using the `SYSTEM` keyword in the `<!DOCTYPE>` declaration.

### Syntax (External DTD)

Date: \_\_\_ / \_\_\_ / \_\_\_

```
<!DOCTYPE root-element SYSTEM "example.dtd">
<root-element> Some Text <child-element>
<root-element> Some Text <child-element>
```

In this example the external DTD is defined in a file called example.dtd which contains the same DTD rules in the internal DTD.



Ques-01 Design a self describing XML  
dtd for storing email data.

[AKTU-2022-23]

```

<!DOCTYPE emailData [
    <!ELEMENT emailData (email*)>
    <!ELEMENT email (sender, recipient,
                     subject, body)>
        <!--Pass character data-->
    <!ELEMENT sender (#PCDATA)>
    <!ELEMENT recipient (#PCDATA)>
    <!ELEMENT subject (#PCDATA)>
    <!ELEMENT body (#PCDATA)>
]>

</emailData>
<email>
    <sender> Sender@gmail.com </sender>
    <recipient> Recipient@gmail.com </recipient>
    <subject> Example Subject </subject>
    <body> This is body email </body>
</email>
</emailData>

```

[AKTU-2021-22]

<!DOCTYPE weather Report [

<!ELEMENT weather Report (date, location,  
temperatureRange)>

<!ELEMENT date (#PCDATA)>

<!ELEMENT location (city, state, country)>

<!ELEMENT city (#PCDATA)>

<!ELEMENT state (#PCDATA)>

\* <!ATTLIST country code #REQUIRED>

<!ELEMENT temperatureRange (high, low, unit)>

<!ELEMENT high (#PCDATA)>

<!ELEMENT low (#PCDATA)>

<!ELEMENT unit (#PCDATA)>

]>

Q-3 Design a XML DTD for self describing weather report having details : date, location, temp range [location, city, state and country). [Country code is unique & not left blank.] Temp range des? Fahrenheit & Celsius

## XML Schemas [AKTU-2021-22]

- Commonly known as XML Schema Definition (XSD). It is used to describe and validate the structure and content of XML Data.
- It is like DTD but provides more control on XML structure.

Syntax :-

`<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">`

### Definition Type

#### 1. Simple Type

→ Used only in the context of the text

Ex:- `xsd:int`, `xsd:string`.

#### 2. Complex Type

→ It is the container for other elements, definition allows you to specify which child element an element can contain to provide some structure within your XML document.



Example :- (Add.xsd)

```

<?xml version="1.0" encoding="UTF-8"?>
<xsi:Schema xmlns:xsi="http://www.w3.org/2001/XMLSchema#"
  elementFormDefault="qualified">

  <xsi:element name="Address">
    <xsi:complexType>
      <xsi:sequence>
        <xsi:element name="Name" type="xs:string"/>
        <xsi:element name="Phone no" type="xs:int"/>
      </xsi:sequence>
    </xsi:complexType>
  </xsi:element>
</xsi:Schema>

```

(Add.xml)

```

<?xml version="1.0" encoding="UTF-8"?>
<Address>
  <xsi:schemaLocation="http://www.w3.org/2001/XMLSchema# Add.xsd">
    <xsi:element name="Name"> XYZ </xsi:element>
    <xsi:element name="Phone no"> 123456 </xsi:element>
  </Address>

```

- Sequence's child element should appear in sequence

## Application of XML [AKTU-2022-23]

- XML is a markup language based on Standard Generalized Markup Language used for defining markup language.
- It is used to encode information for documentation.
- It is used to transfer data b/w two System.

## Difference b/w DTD and XSD

[AKTU - 2022-23]

| DTD  | XSD                                    |
|--|--|
| • DTD Stands for Document Type Definition                  | • XSD Stands for XML Schema definition |
| • DTD are derived From same Syntax                         | • XSD are written in XML               |
| • DTD doesn't support datatype for elements and attributes | • XSD supports                         |
| • DTD doesn't support                                      | • XSD supports                         |

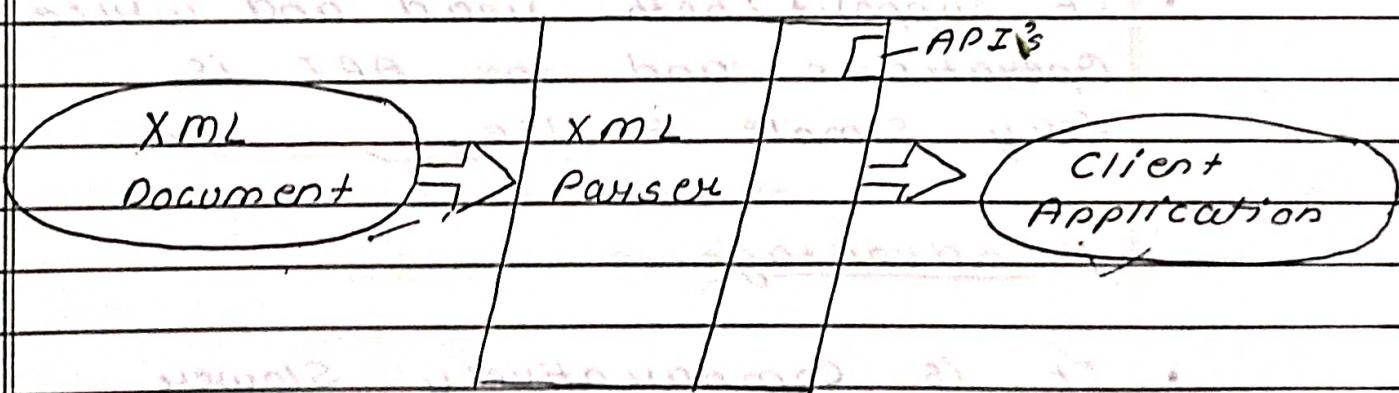
## Namespace

## namespace

- OTO is not extensible
- OTO is not simple to learn
- XSD is extensible
- XSD is simple to learn

## XML Parsers

- It is a software library (or package) that provides methods (or interfaces) for client application to work with XML document
- The XML parser is designed to read the XML and create a way for programs to use XML



## Types of XML Parsers

1.

DOM

2.

SAX

### DOM :-

- DOM Stand For Document Object model.
- A DOM document is an object which contains all the information of an XML document.
- It is composed like tree structure.
- The DOM parser implements a DOM API.
- The API is very simple to use.

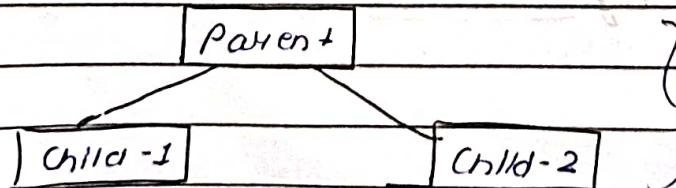
### Advantages

- It supports both read and write operations and the API is very simple to use.

### Disadvantage :-

- It is comparatively slower than other parsers.

ex :-



## SAX API

- A SAX Parser implements SAX API.
- This API is an event-based API.
- It does not create any internal structure.
- Client does not know what method to call, they just overrides the methods of the API.

## Advantages

- It is simple and memory efficient.
- It is very fast and works for huge documents.

## Disadvantages

- Client never knows the full information because the data is broken into pieces.

Qn-01

Difference b/w HTML &amp; XML? [AKTU-21-22]

HTML

XML

- Hyper text mark-up language

- Extensible markup language

- Static in nature

- Dynamic in nature

- Ignore small errors

- Don't ignore small errors

Qn-2

Difference b/w `<div>` and `<span>` tag? [AKTU-2018-19]`<div>``<span>`

- Block level element

- Inline level element

- Used to wrap section of a doc<sup>m</sup>

- Used to wrap small portions of text, image

- Used while creating CSS base layout of HTML

- Used to stylize text

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