

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 :-

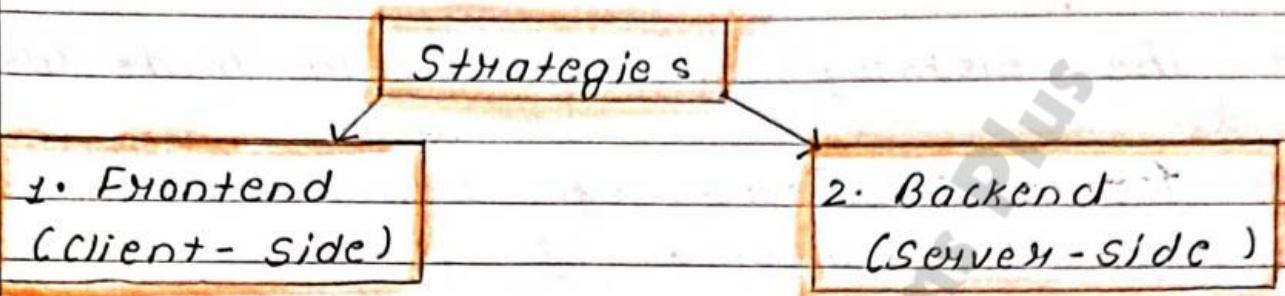
- Web Technology refers to the tools and techniques used to create websites that run on the internet.

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
↳ C → W → Ch-1
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)

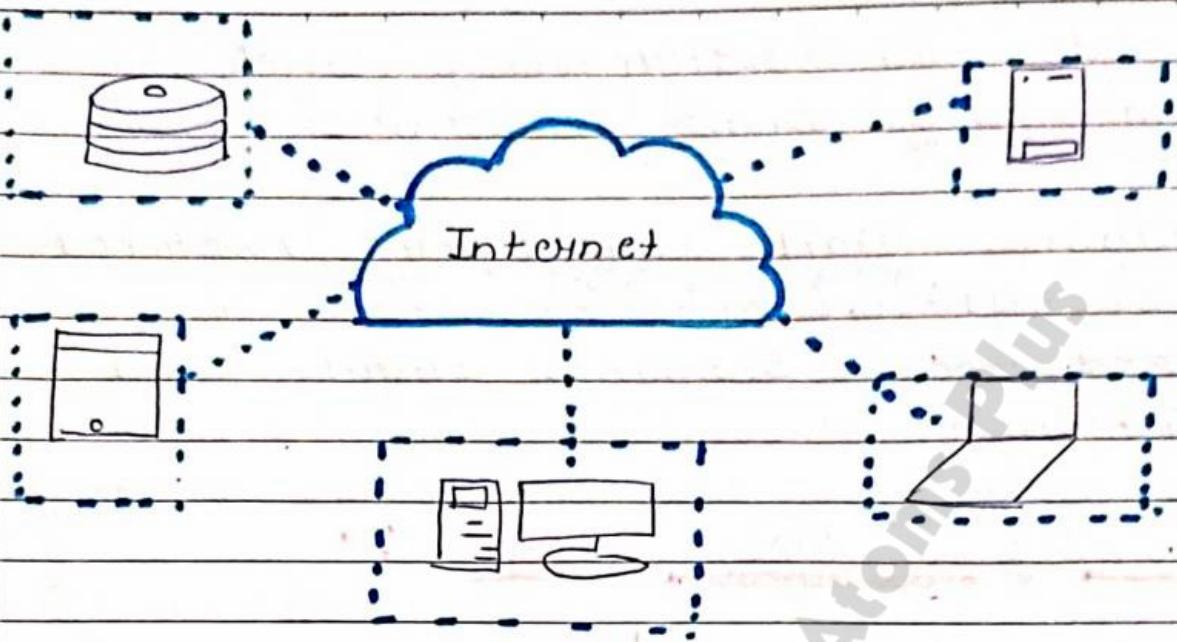
- The backend is the behind the scenes part of the website. It's where the website's data is stored, processed, and managed.
- Includes:- Servers, databases
- Languages:- Python, PHP, MongoDB, MySQL

History of Web :-

- Sir Tim Berners-Lee invented the World Wide Web in 1989
- 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

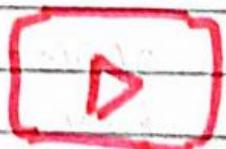


Deploy Your Website



Get Feedback & Improve

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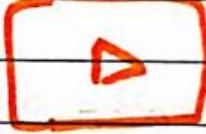
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UNIT-01 (LEC- 02)

Web Technology (BCS-502)

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

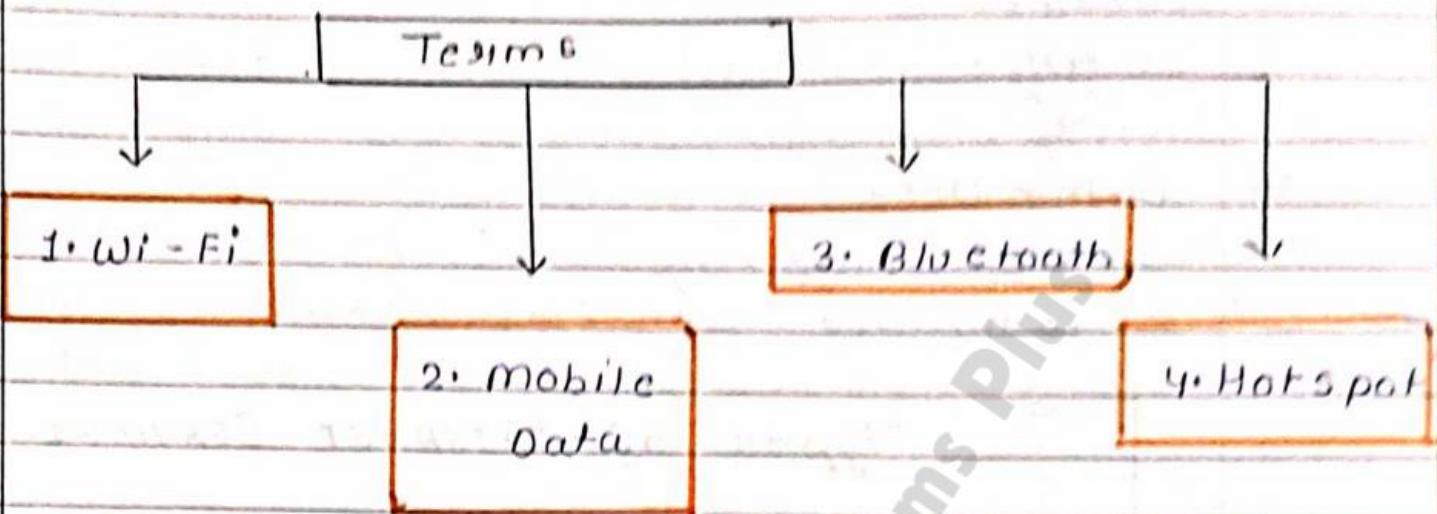
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Connecting to Internet:

"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 :

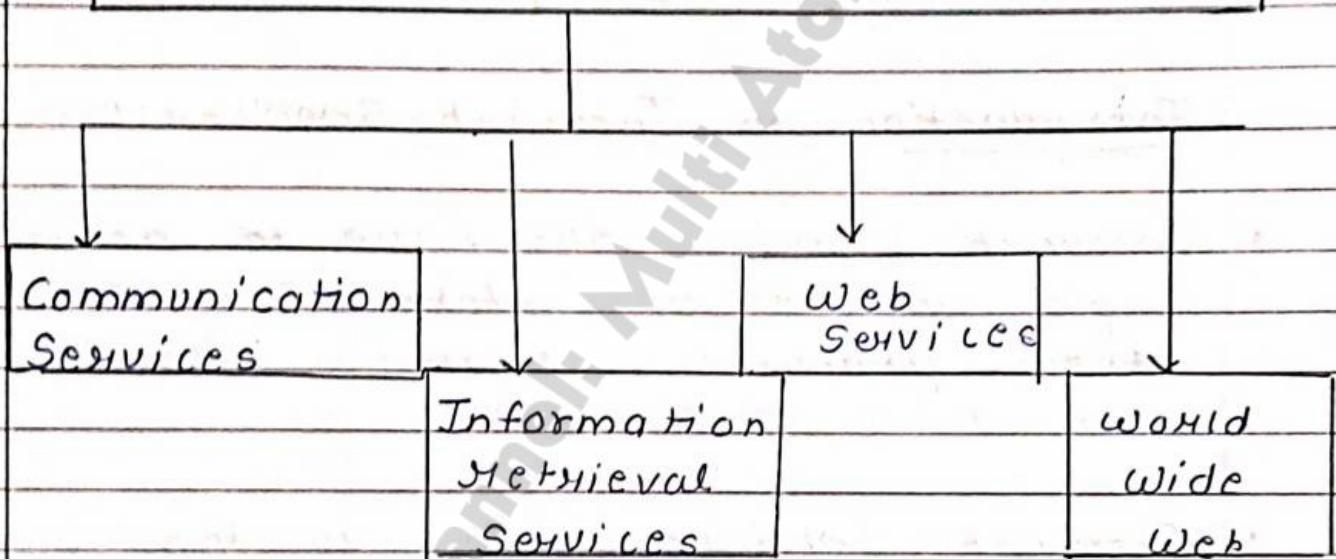
- Internet Services allows us to access huge amount of information such as text, graphics, sound over the Internet
 - Internet Services refers to the various types of services that can be accessed and utilized through the internet
- 1 Access Information
- Website
 - Online libraries
- 2 Communicate
-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

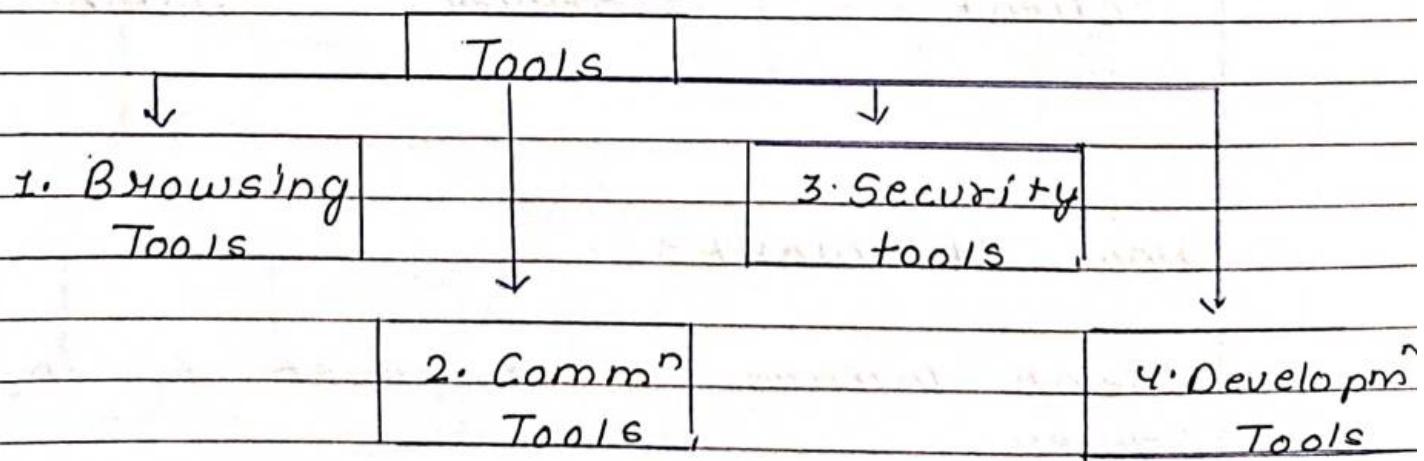
Like → AWS, Google maps API, weather API

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^m 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

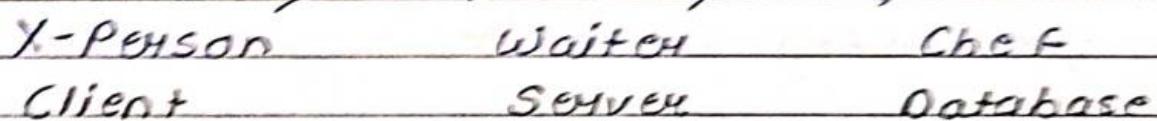
1. VPNs (Virtual Private Network)
2. Antivirus Soft (Norton)

Development Tools

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

Client-Server Computing

Restaurant



How It Works :-

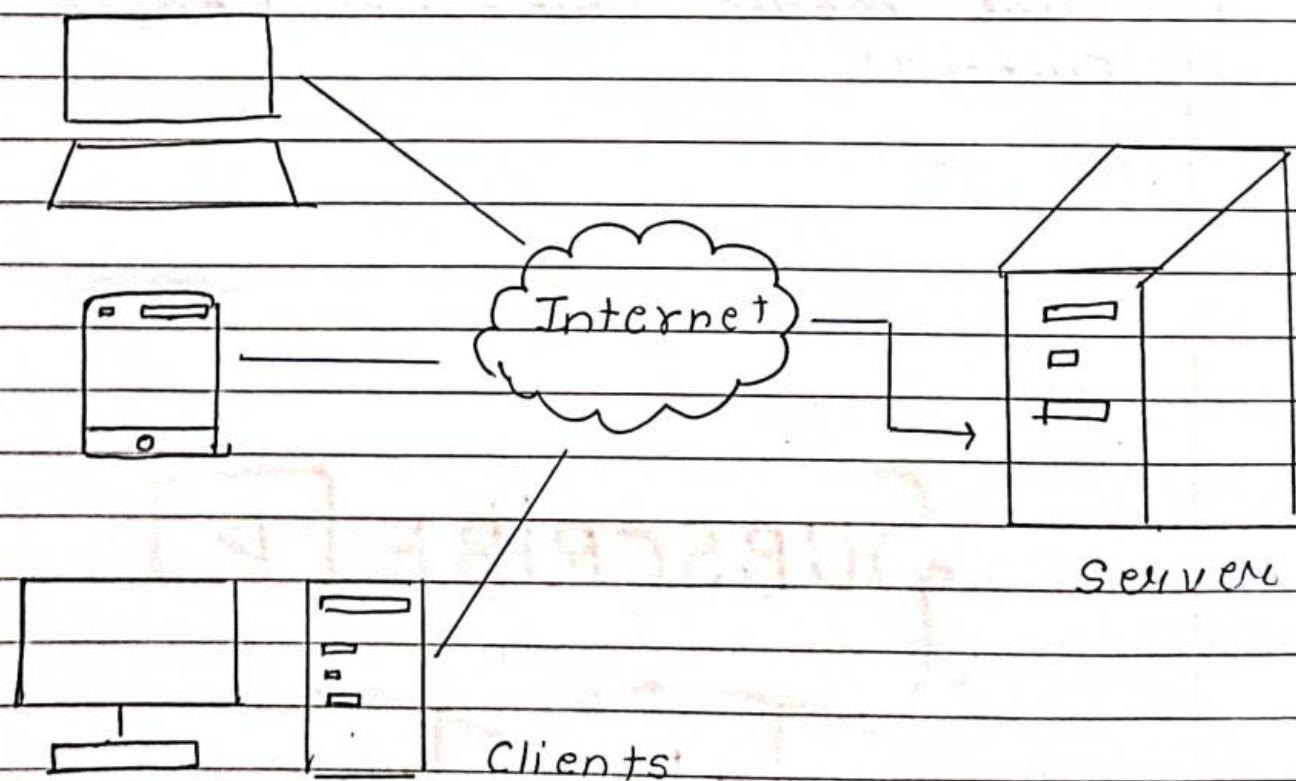
1. Client Initiate a request to the SERVER.

- 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

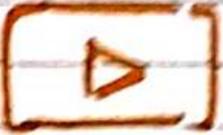
- Web - browser (Chrome, Firefox)
- Email Client (Gmail)
- Social media platforms (Facebook, Twitter)

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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	HTML5
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>`

- `
` Tag :-

`br` Stands for break line

- `` :- It is used to insert image.

- `` :- It is used to represent items in list.

- `<p>` :- It represents a Paragraph

- `<table>` :- Used to create table

- `<i>` :- Italic text.

- `` :- 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

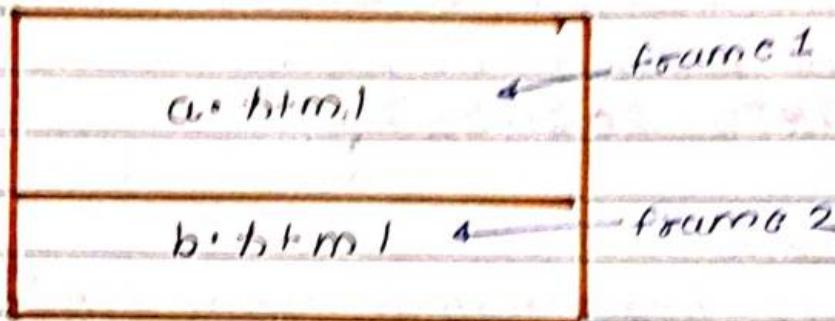
th :- Define a header cell in a table

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 set tag is used divide browser.



Attribute of Frame set 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="fname"> First name: </label>
`
`<input type="text" id="fname">`

O/P :- First name: -

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 `` tag. Each list items `` tag

For - ex :- ``

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

- Coffee
- Tea

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

For - ex :- ``

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

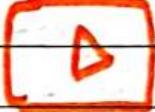
- 1. Coffee
- 2. Tea

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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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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
- Contain 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

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 :

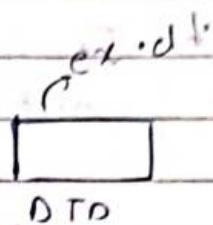
- An External DTD is defined in a separate file and its referenced by the XML document using the `SYSTEM` keyword in the `<!DOCTYPE>` declaration.

Syntax (External DTD)

Date : ___ / ___ / ___

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

In this example the external DTD is defined in a file called example.dtd which contains the same DTD source 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)>
        <!--Parses (having) 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,
temperature Range)>

<!ELEMENT date (#PCDATA)>

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

<!ELEMENT city (#PCDATA)>

<!ELEMENT state (#PCDATA)>

*<!ATTLIST country code CDATA #REQUIRED>

<!ELEMENT temperature Range (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"?>
<xs:Schema xmlns:xs = "http://www.w3.org/2001/XMLSchema" name="schema1">
  <xs:element name = "Address">
    <xs:complexType>
      <xs:sequence>
        <xs:element name = "Name" type = "xs:string"/>
        <xs:element name = "Phone no" type = "xs:int"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:Schema>
  
```

(Add.xml)

```

<?xml version="1.0" encoding="UTF-8"?>
<Address>
  <Name> XYZ </Name>
  <Phone no> 123456 </Phone no>
</Address>
  
```

path of XML Schema defn file

xs: schema location = ".....Add.xsd" >

- Sequence's child element should appear in sequence

Application of XML [AKTU-2022-23]

- XML is a markup lang" based on Standard Generalized Markup Lang" 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]

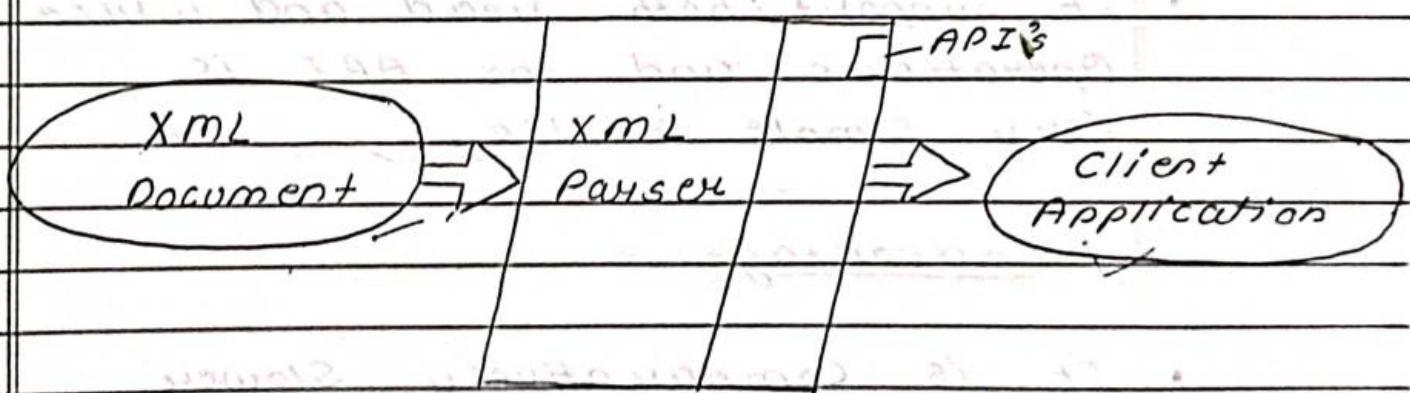
DTD	XSD
• DTD Stands for Document Type Definition	• XSD Stands for XML Schema definition
• DTD are derived From Same Syntax	• XSD are written in XML
• DTD doesn't support datatype	• XSD supports datatype for elements and attribute
• DTD doesn't support	• XSD supports

NamespaceNamespace

- DTO is not extensible
- XSD is extensible
- DTO is not simple to learn
- 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.

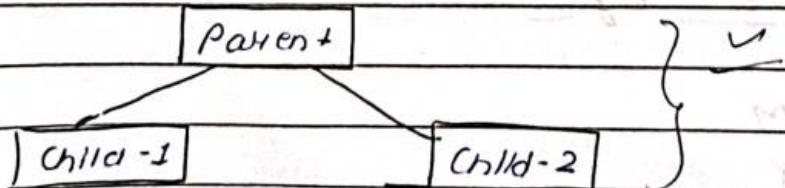
Advantages

- 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 :-

- A SAX Parser implement 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 work for huge documents.

Disadvantage

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

Qn-01

Difference b/w HTML & 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-2Difference b/w `<div>` and `` tag? [AKTU-2018-19]

div

span

- Block level element

- Inline level element

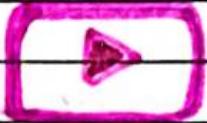
- Used to wrap section of a doc^m

- Used to wrap small portions of text, image

- Used while create CSS base layout of HTML

- Used to stylize text

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