IT1100 - Internet and Web Technologies

Introduction

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Internet and Web technologies

- Module Code IT1100
- Credit Points 04

Method of Delivery

- 2 hours - lectures
- 1 hour - tutorials
- 2 hours - labs

- Enrollment Key IT1100

Assessment Criteria

Component	%
Mid Semester Exam	20%
Assignment – part 01	10%
Assignment – part 02	20%
Final Exam	50%

Important

To pass this module Student need to obtain a pass mark in both “Continues assessment“ and “End of the Semester Examination “ components which would result in an overall mark that would qualify for a C grade or above.

Assignments

You need to get into **5-member** group for the assignment within the **same subgroup**.

- You must “Develop a web Application”
- Project Titles are given by us

Assignment Submissions

- 5th Week – Documentation of your project plan
- 12th Week – Final project submission
- 13th Week - Viva

Reference Materials

- W3 school - https://www.w3schools.com/
- J. Reynolds and R. Mofazali, *The complete e-commerce book: design, build, and maintain a successful web-based business*, 1st. ed., C M P Books, 2000.
- R. Nixon, *Learning PHP, MySQL, JavaScript and CSS: A step-by-step guide to creating dynamic websites*, O'Reilly Media, Inc., 2012.
- H. Sharp, Y. Rogers, and J. Preece, *Interaction Design: Beyond Human-Computer Interaction*, 2nd ed. Wiley, 2007.
- Tutorial point - tutorialspoint.com

PLEAE CHECK THE COURSE WEB REGULARY .....

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Concepts and technologies Associated with the Web applications

Lecture 01

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Content

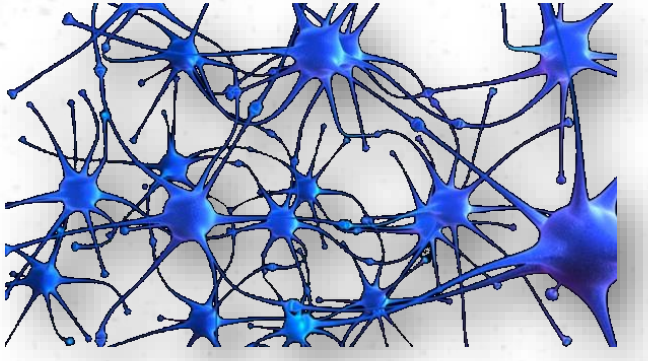
- Data networks and the Internet
- Network Services and Protocols
- Web server and the Browser
- Markup languages

Data Networks and Internet

What is a network?

- A **network** is (according to the Cambridge Dictionary)

  a **large system** consisting of **many similar parts** that are **connected together** to allow **movement** or **communication** along the parts, or between the parts and a control centre.

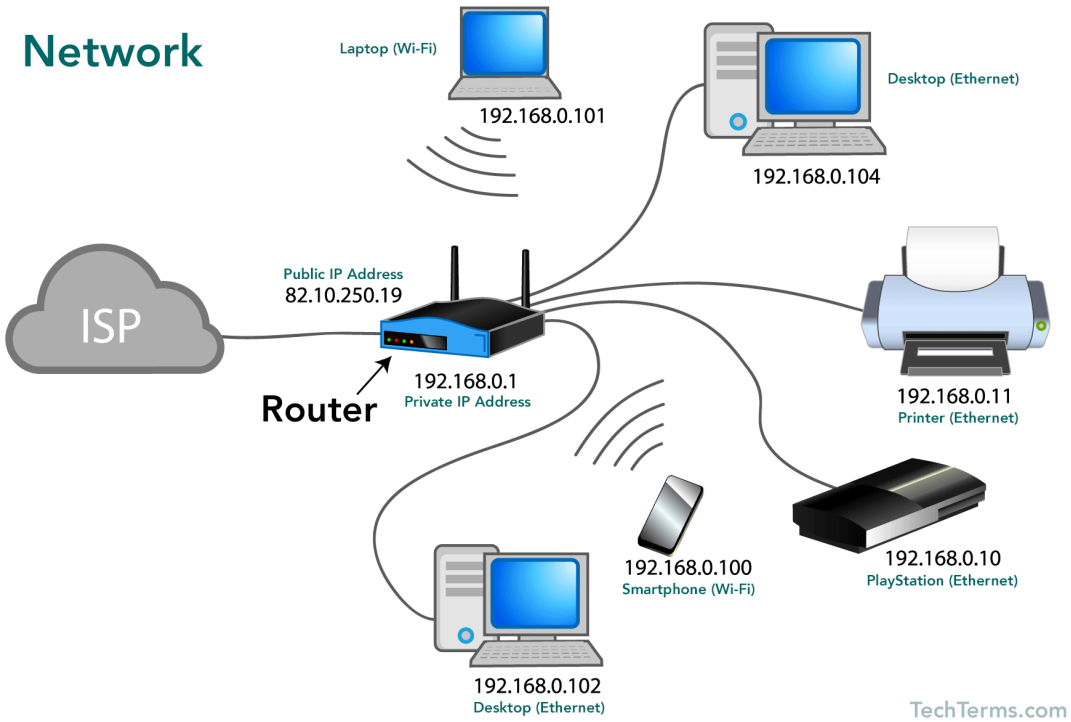


Different types of networks

- There are different types of networks available (according to the nature of the usage)
  - Telecommunication networks
  - Television or radio network
  - Transport networks
  - Social networks
  - **Computer or data networks**

Sri Lanka Telecom

Computer and Data Network



- A computer network, or data network is
  - a **digital** telecommunications network, which allows **nodes** to share **resources**.
  - In computer networks, **computing devices** exchange data with each other using connections between nodes (**data links**).
  - These **data links** are established over **cable media** such as wires or optic cables, or **wireless media** such as WiFi.

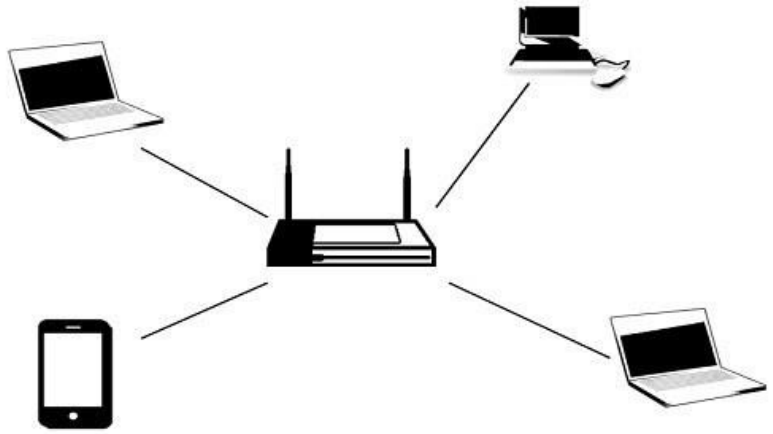
Application of Data Networks

- **Resource Sharing**
  - Hardware (computing resources, disks, printers)
  - Software (application software)
- **Information Sharing**
  - Easy accessibility from anywhere (files, databases)
  - Search Capability (WWW)
- **Communication**
  - Email Message
  - broadcast
- **Remote computing**

Types of data networks - LAN

Local Area Network – LAN

- Network in small geographical Area (Roo Building or a Campus) is called LAN (Loca Area Network)
- Local Area Networks are **privately-owne** networks within a small area, usually a si building or campus of up to **a few kilome**
- Since it is restricted in size, that means their data transmission time can be known in advance, and the network management would be easier.

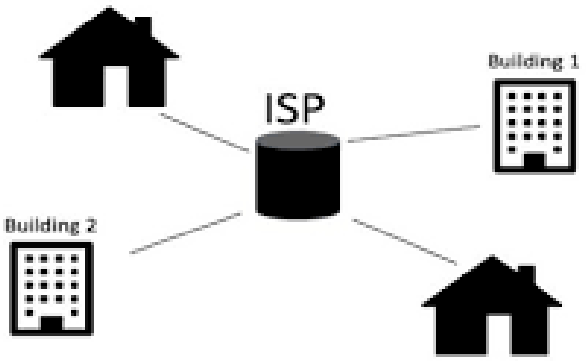


Source: http://cityinfrastructure.com/Data/Daa.html

Types of data networks - MAN

Metropolitan Area Network – MAN

- A Metropolitan Area Network (MAN) is a network that is utilized across multiple buildings
- Commonly used in schools, campuses ,hospitals , banks or large companies with multiple buildings
- Is larger than a LAN, but smaller than a WAN
- Is also used to mean the interconnection of several LANs by bridging them together. This sort of network is also referred to as a campus network

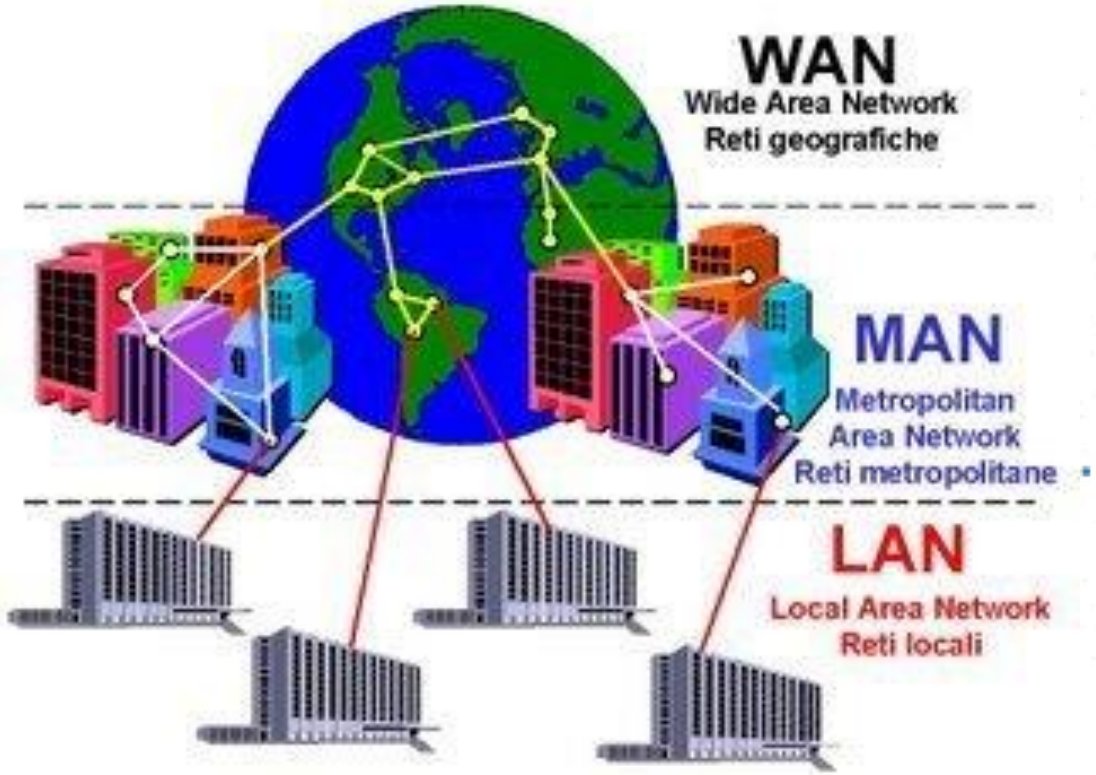


Source: http://cityinfrastructure.com/Data/Daa.html

Types of data networks - WAN

Wide Area Network – WAN

- A Wide Area Network is a network spanning a large geographical area of around several hundred miles to across the globe
- May be privately owned or leased
- Also called “enterprise networks” if they are privately owned by a large company
- Can be connected through cable, fiber or satellite
- Is typically slower and less reliable than a LAN



Internet

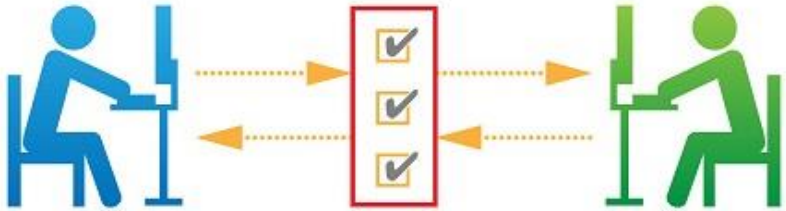
- The Internet is the **global system** of **interconnected computer networks** that use the Internet **protocol** suite to link devices worldwide.
- It is a **network of networks**
- Consists of private, public, academic, business, and government networks of local to **global scope**.
- Linked by a broad array of electronic, wireless, and optical networking technologies.

Source https://en.wikipedia.org/wiki/Internet

Network Services and Protocols

Protocols

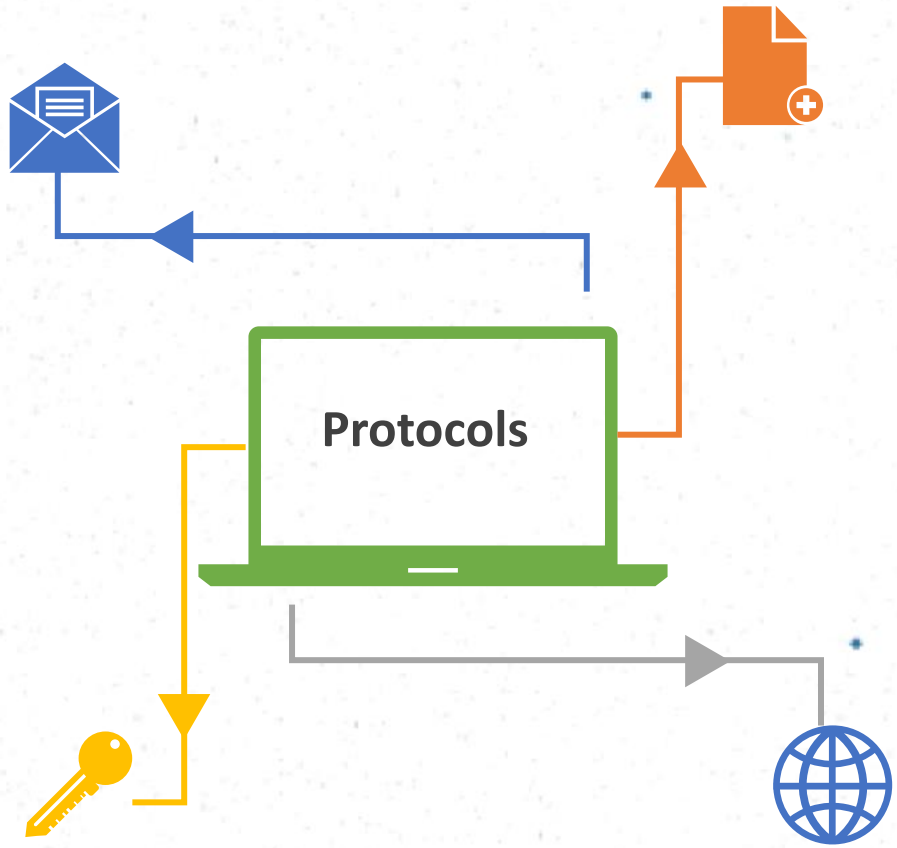
- A protocol is a
  - system of **rules** that allow two or more entities of a **communications** system to **transmit information (wiki)**
  - **the** formal system **of rules for correct behavior on official occasions (Cambridge)**



Different Types of Services and Protocols

Mail service (POP3/SMTP/IMAP)

File Transfer (FTP)



Remote Logging (SSH)

Web (HTTP/HTTPS)

Web server and the Browser

Identify the browsers

We Use a browser to send HTTP/ HTTPS request

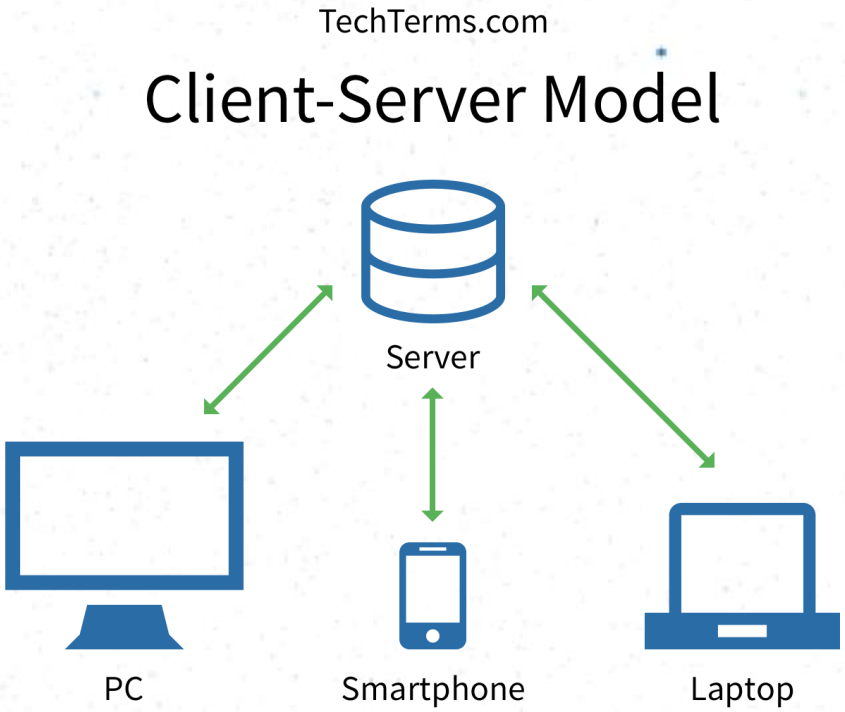
The browser

- Usually, the clients use the web browser to access the web application in the server, based on the request-response pattern.
  1. The user enters the address of the web server (domain name) into the browser.
  2. The browser sends a request to the web server
  3. The server responses with the client components
  4. The client components are loaded into the browser
  5. The browser reads the content and renders

The Server

- A server is a software, which knows how to handle the requests and responses, while providing a specific service
- A web server is used to host a web application.
  - **Apache (for php development)**
  - **Tomcat (for JAVA development)**
  - **IIS (for .NET/ASP development)**
- Web server knows how to communicate with the clients using the **HTTP/HTTPS**

Client and Server



Types of languages

- High level/Compiled languages– Java, C, C++
- Scripting languages – JS,PHP, Python
- Markup languages – XML, HTML,XHTML

Markup Languages

extensible Markup Language

- Designed to store and transport data
- Both human- and machine-readable (self descriptive)
- Often used for distributing data over networks
- Used by may other tools like protocols

```
<?xml version="1.0"?>
<quiz>
 <qanda seq="1">
  <question>
   Who was the forty-second
   president of the U.S.A.?
  </question>
  <answer>
   William Jefferson Clinton
  </answer>
 </qanda>
 <!-- Note: We need to add
  more questions later.-->
</quiz>
```

XML

XML

- The main and the only component of XML is called an **element**
- An element has 3 components
  1. Start tag
  2. Body
  3. End tag
- **No predefined set of elements, attributes, and values for attributes**

<Tag_name>IWT</Tag_name>

XML

- An element has a name
  - **Element names are case-sensitive**
  - Element names must start with a letter or underscore
  - Element names cannot start with the letters, xml (or XML, or Xml, etc)
  - Element names can contain letters, digits, hyphens, underscores, and periods
  - Element names cannot contain spaces
  - Any name can be used, no words are reserved (except xml)

<**Module**>IWT</**Module**>

XML

- Element names – naming styles

Style	Example	Description
Lower case	<firstname>	All letters lower case
Upper case	<FIRSTNAME>	All letters upper case
Underscore	<first_name>	Underscore separates words
Pascal case	<FirstName>	Uppercase first letter in each word
Camel case	<firstName>	Uppercase first letter in each word except the first

XML

- <?xml version="1.0" encoding="UTF-8"?>

  - This is the XML declaration
    - Provides the instructions for the processor to understand the details of the XML file
    - Encoding attribute indicates the character set
      - UTF-8 = Unicode Transformation Format (with 8-bit blocks to represent a character)
  - An element may have attribute(s)
    - Attributes describe the element
  - Attribute value is always quoted (either **single** or **double** quote)
  - <person **id="1"**>Saman</person>

XML

- There can be multiple **attributes** for an element

```
<person id="1" age="35">
    Saman
</person>
```

- Attributes are separated by a space

- There are special type of element with a single self closing tag

```
<age/>
```

XML

- **Elements can be nested**

```
<person id="1">
        <firstname>Saman</firstname>
        <lastname>De Silva</lastname>
         <age/>
</person>
<person id="2">
        <firstname>Saman</firstname>
        <lastname>De Silva</lastname>
         <age>28</age>
</person>
```

- The first element, which wraps and holds the other elements is called, the **root element**

XML

- Learn more about XML

https://www.w3schools.com/xml/default.asp

- HTML Unicode (UTF-8) Reference

https://www.w3schools.com/charsets/ref_html_utf8.asp

Question

- Write XML code to store following personal data
  - Name
  - Gender
  - Age
  - School

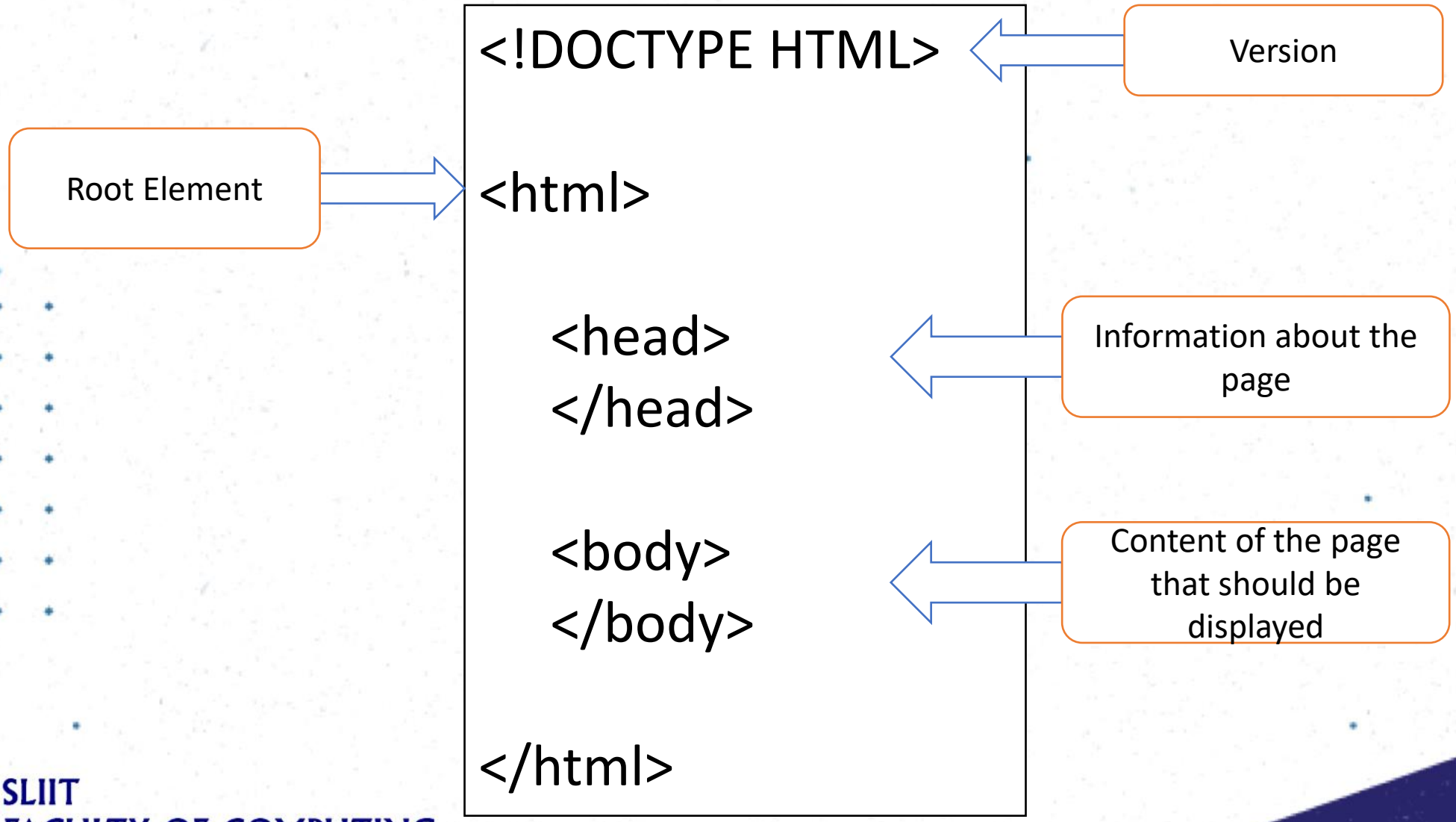
HTML – Hyper Text Markup Language

- HTML is the standard language to develop pages
- The web browser knows to read the HTML document and render the content, showing a nice GUI for web sites/applications
- HTML has a predefined set of elements, attributes, and values for some attributes

HTML – Hyper Text Markup Language

- HTML document (or the web pages) are hosted in a web server
- User requests for the initial web page by entering the address on the browser
- Thereafter the user can navigate through the web pages in the site/application using the **hyperlinks**

HTML – Structure of HTML document

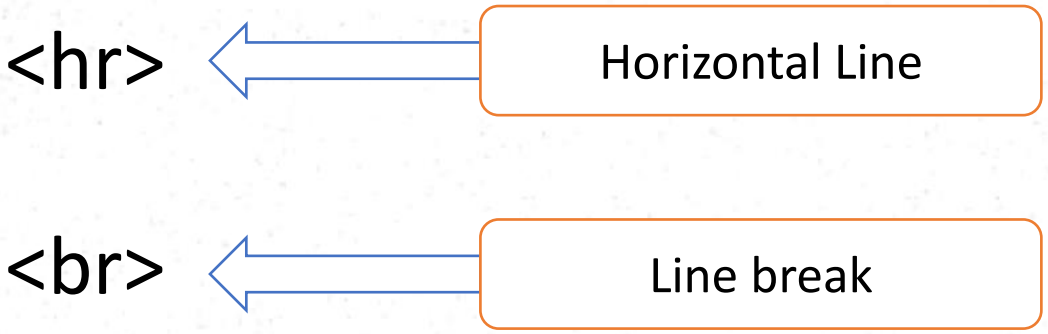


HTML – Types of element

- Structural elements
  - header, footer, nav, aside, article
- Text elements
  - Headings – <h1> to <h6>
  - Paragraph – <p>
  - Line break -
- Images
  - <img src="imgName.jpg" alt="description">

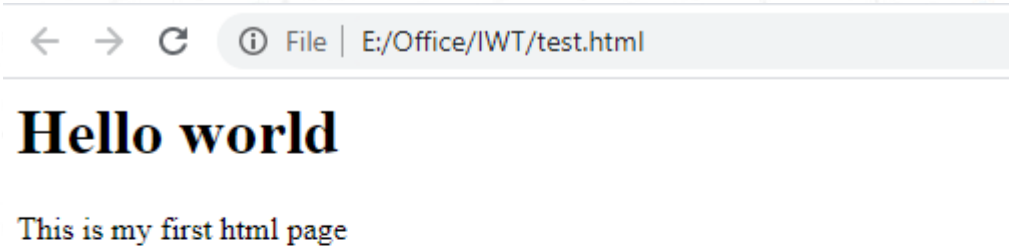
HTML – Types of element

- The HTML elements that doesn't contain any closing tag is referred as "Empty Elements".



HTML – First page

```
<!DOCTYPE html>
<html>
    <head>
        <title>My first page</title>
    </head>
    <body>
        <h1>Hello world</h1>
        <p>This is my first html page</p>
    </body>
</html>
```



HTML – Types of element

- Data representational elements (these elements use nested structures)

```
Lists
<ul>
  <li>IWT</li>
  <li>OOP</li>
  <li>Database</li>
</ul>
```

Lists

- IWT
- OOP
- Database

```
Lists
<ol>
  <li>IWT</li>
  <li>OOP</li>
  <li>Database</li>
</ol>
```

Lists

1. IWT
2. OOP
3. Database

```
tables
<h2>Table</h2>
<table border="1">
  <tr>
    <th>IWT</th>
    <th>OOP</th>
    <th>Database</th>
  </tr>
</table> >
```

Table

IWT	OOP	Database

HTML

- You will learn more about these elements and their use in practical class

- Learn more about HTML and HTML5
  - https://www.w3schools.com/html/default.asp
  - https://www.w3schools.com/html/html5_intro.asp

Question

- Write html code to display following personal data
  - Name
  - age
  - School

```
<!DOCTYPE html>
<html>
    <head>
     <title>My first page</title>
    </head>
    <body>
     <h1>My name is Saman De Silva</h1>
     <p>I am 70 years old</p>
     <p>My School is ABC college</p>
    </body>
</html>
```

Summary

- Data networks and the Internet
- Network Services and Protocols
- Web server and the Browser
- Markup languages