SCS 1311 – Internet and Web Technologies

HTML

Gayani Rupasinghe
University of Colombo School of Computing
gsr@ucsc.cmb.ac.lk

Evaluation Criteria

Assignments - 30%
Final Exam - 70%

Introduction to the Internet and Web

What is the internet?

- The internet, simply called as *the net,* is a worldwide system of interconnected computer networks and electronic devices that communicates with each other using a set of protocols called TCP/IP.
- With the internet, it's possible to access almost any information, communicate with anyone else in the world.

Introduction to the Internet and Web

What is the internet?

- Internet was evolved in 1969, under the project called ARPANET (Advanced Research Projects Agency Network) to connect computers at different universities and U.S. defence.
- In 1990s the internet working of ARPANET, NSFnet and other private networks resulted into Internet.

Introduction to the Internet and Web

How does the internet work?

- The internet works by connecting networks together through a series of routers and switches.
- When information travels across the Internet, it is broken into small **packets**.
- A **router** forwards packets of data between different networks while a **switch** links devices within a single network.

Introduction to the Internet and Web

How does the internet work?

- Every device connected to the Internet has an **IP address** that uniquely identifies it.
- Each packet knows its **destination IP address** and moves independently through many routers until it reaches the right computer, where packets are reassembled.
  - IPv4 address: 192.168.1.10
  - IPv6 address: 2001:0db8:85a3::8a2e:0370:7334

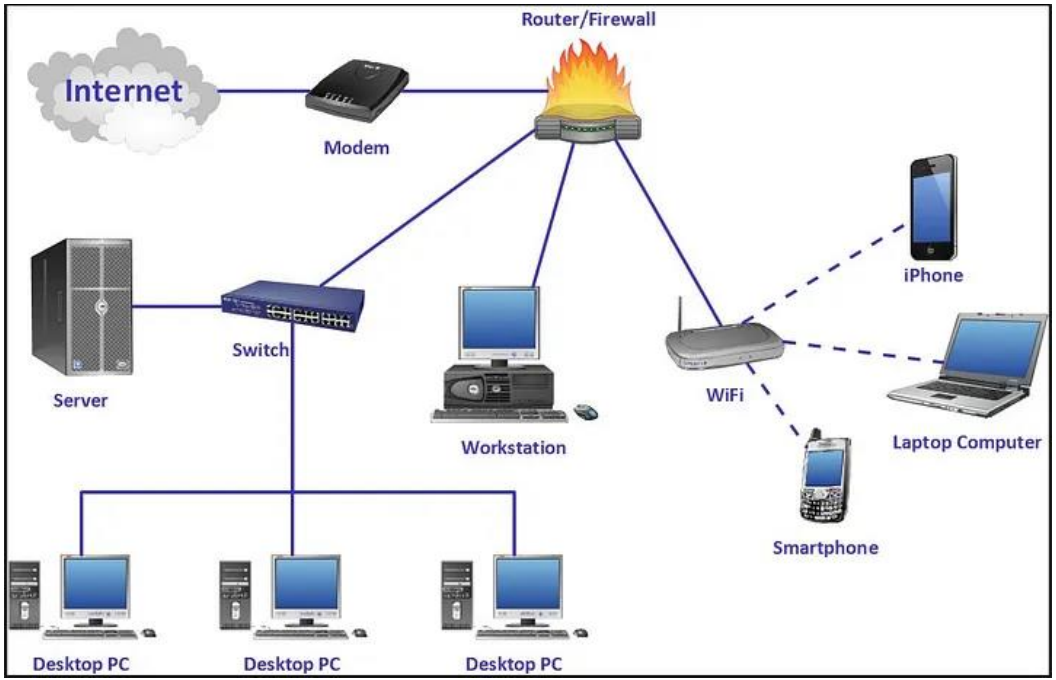
Introduction to the Internet and Web

How does the internet work?

- Protocols define the rules for how data is sent and understood between devices.
- **Internet Service Provider (ISP)** connects you to the global Internet backbone.

Introduction to the Internet and Web

How does the internet work?



Introduction to the Internet and Web

What is the World Wide Web (WWW)?

- The World Wide Web (WWW), commonly referred to as the web, is a system of **interlinked documents** called **web pages** written in **HTML** (HyperText Markup Language) and accessed through **web browsers,** over the internet.
- The World Wide Web is made up of a series of protocols and technologies, including **HTML, CSS, JavaScript, and HTTP.**

Introduction to the Internet and Web

What is the World Wide Web (WWW)?

- HTML is the language used to create web pages, and CSS is used to define the layout and design of a webpage.
- JavaScript is a scripting language for developing interactive web pages.
- Web pages are linked through hyperlinks

Introduction to the Internet and Web

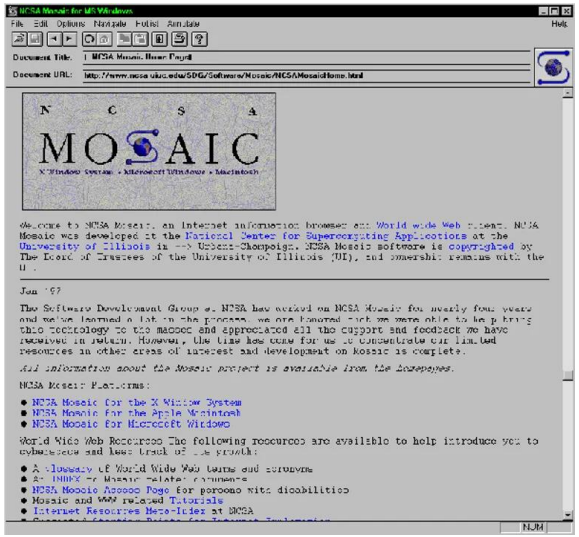
What is the World Wide Web (WWW)?

- Web servers store and deliver these pages
- Web browsers request, download and display them
- HTTP is the protocol used to transfer data between web servers and browsers.

Introduction to the Internet and Web

History and evolution of Web Development

- 1989: Tim Berners-Lee proposed the Web at CERN.
- 1991: First website published.
- 1993: First graphical browser (Mosaic).
- Today: Billions of sites, multimedia, and interactive web apps.



Introduction to the Internet and Web

Evolution of Web from 1.0 to 5.0

- **Web 1.0** was coined by Tim Berners-Lee as “read only” web.
- Websites built entirely with HTML; no interaction or user input.
- Internet users were only reading information presented to them.
- The primary aim of the websites was to make information public for anyone, and set up an online presence.

Introduction to the Internet and Web

Evolution of Web from 1.0 to 5.0

- **Web 2.0** is described as the wisdom, people-centric, participative, and read- write web.
- Unlike 1.0 version, Web 2.0 allows more control to users and provides interaction.
- Users could contribute content and websites became interactive and collaborative.
- Rise of social media, AJAX, JavaScript frameworks, dynamic pages.

Introduction to the Internet and Web

Evolution of Web from 1.0 to 5.0

- **Web 3.0**, machines began to understand data meaning, not just display it.
- Use of metadata, linked data, and semantic markup so computers can interpret relationships.
- Integration of AI, natural language processing, and personalized recommendations.

Introduction to the Internet and Web

Evolution of Web from 1.0 to 5.0

- **Web 4.0**, Web access anytime, anywhere across devices and IoT systems
- Cloud computing, real-time data sharing, smart devices.
- Focus on user experience, mobility, and instant communication.

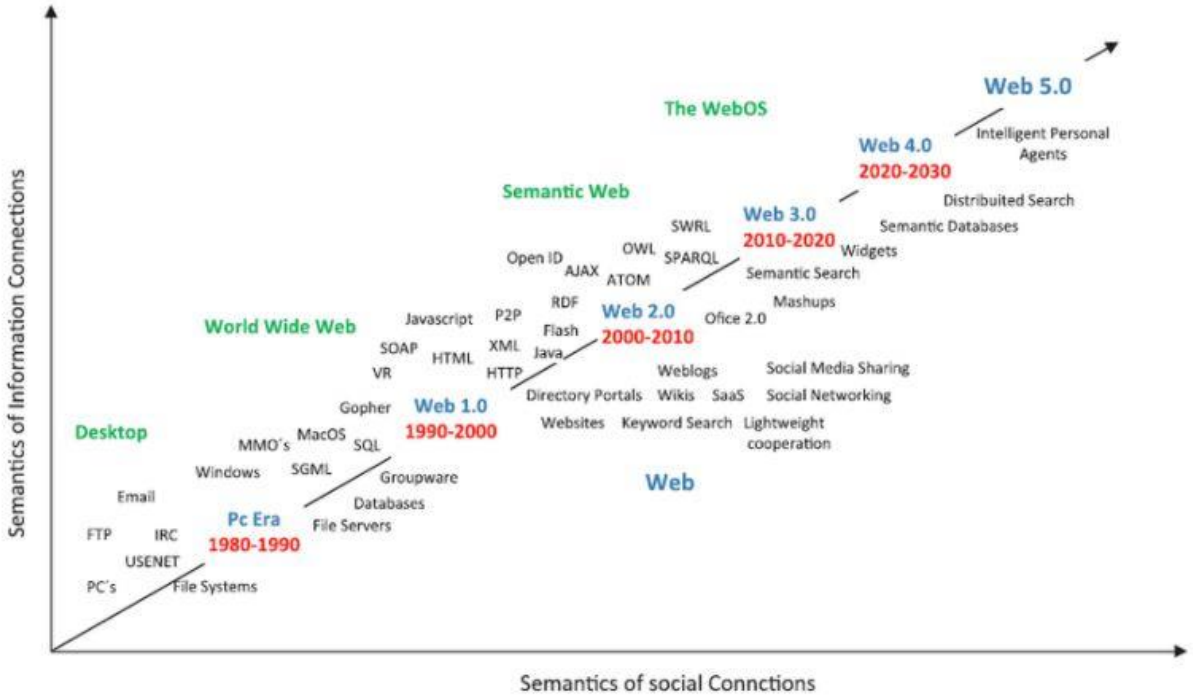
Introduction to the Internet and Web

Evolution of Web from 1.0 to 5.0

- **Web 5.0**, next generation aims to make the Web emotionally aware and deeply personalized.
- Integration of AI, machine learning, virtual reality, and brain computer interfaces.
- Focus on creating immersive and human like experiences.

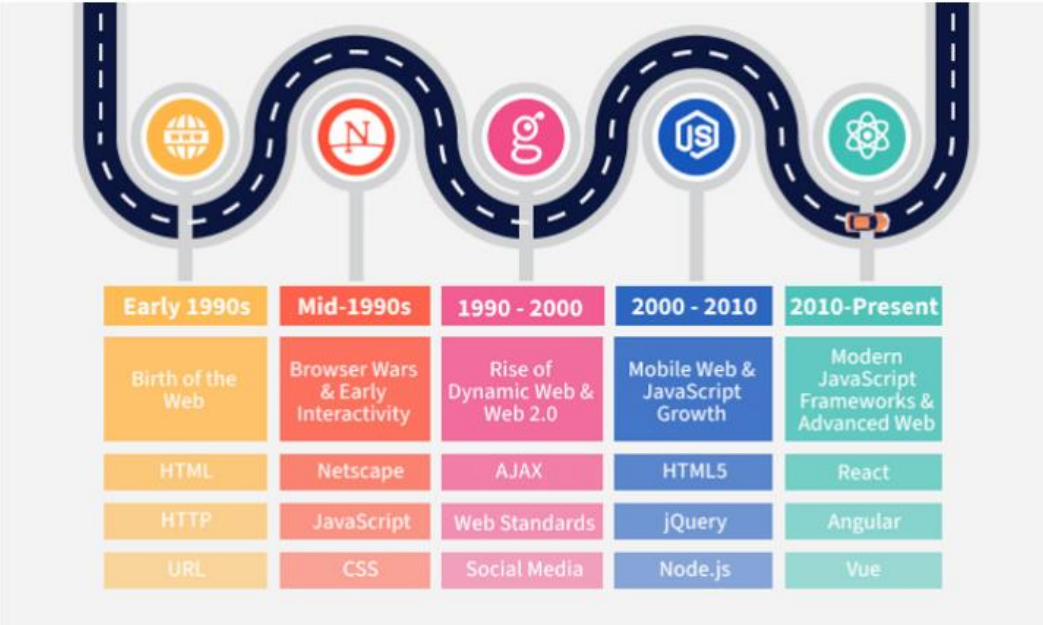
Introduction to the Internet and Web

History and evolution of Web Development



Introduction to the Internet and Web

History and evolution of Web Development



Introduction to the Internet and Web

Internet vs Web

Internet	World Wide Web
Physical network infrastructure	Service that uses that infrastructure
Uses TCP/IP	Uses HTTP/HTTPS
Includes email, chat, FTP, video calls	Includes web pages, web apps
Connects computers	Connects information

Introduction to the Internet and Web

URL

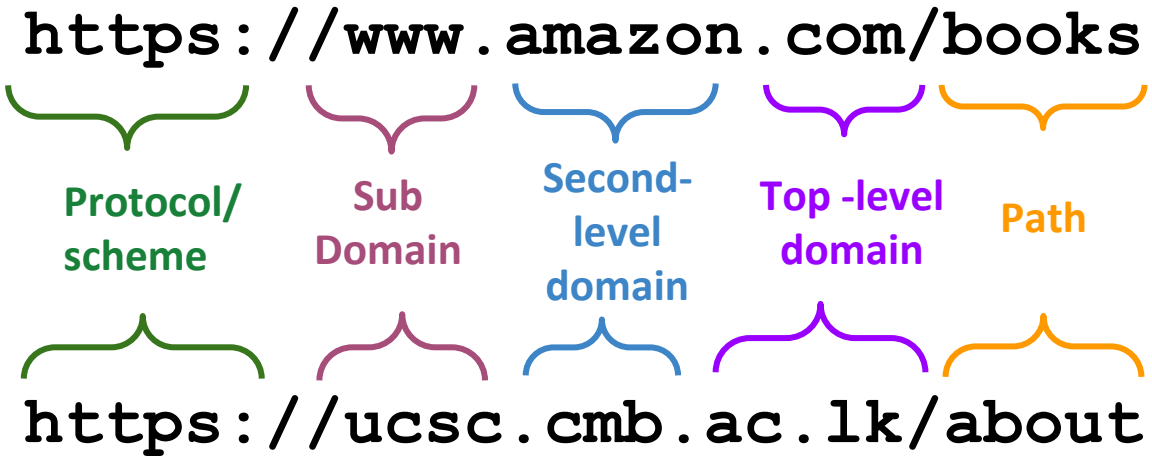
- A **URL** (**U**niform **R**esource **L**ocator) identifies the location of a resource on the Web.
- In most web browsers, the URL of a web page is displayed on top inside an address bar.

`https://www.amazon.com/books` Commercial URL

`https://ucsc.cmb.ac.lk/about` Academic URL

Introduction to the Internet and Web

URL



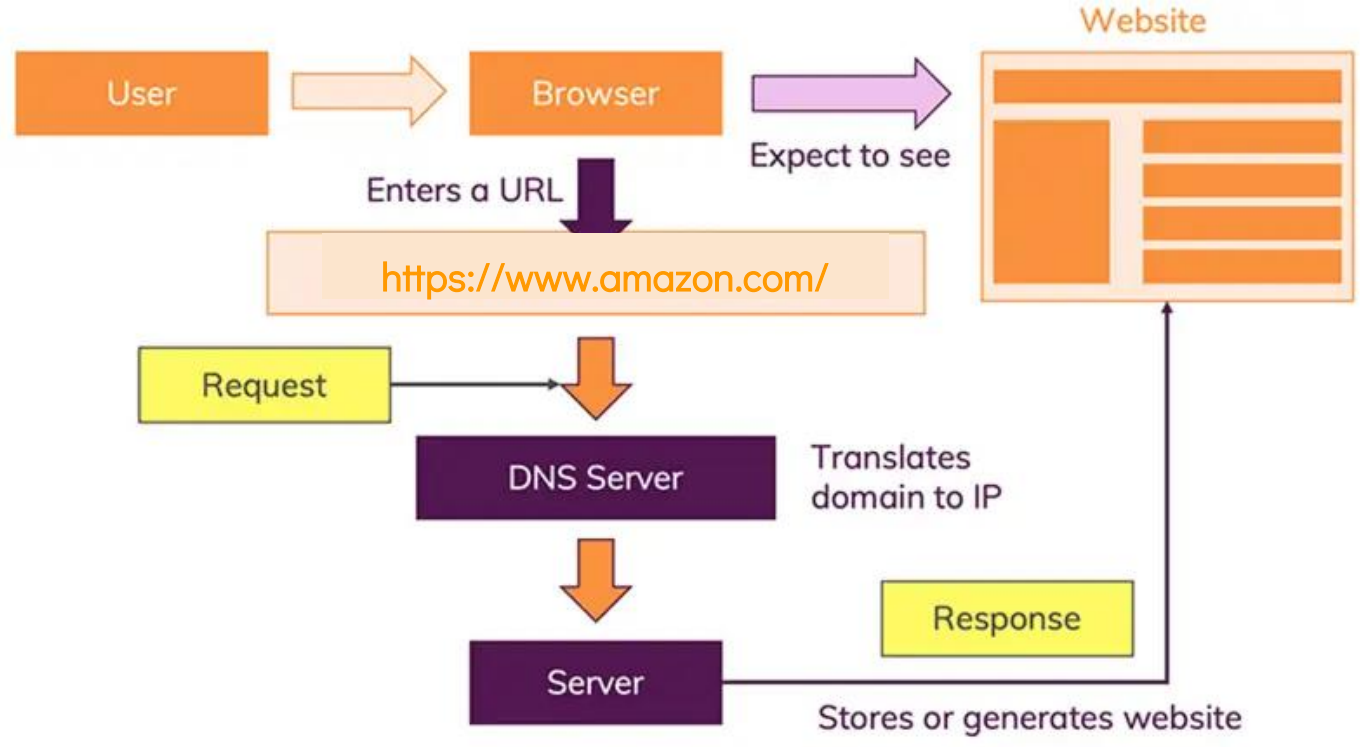
Introduction to the Internet and Web

DNS

- The **Domain Name System** converts domain names into IP addresses.
- When you type a URL, the browser first asks a **DNS server** for the correct IP address, then connects to that number behind the scenes.

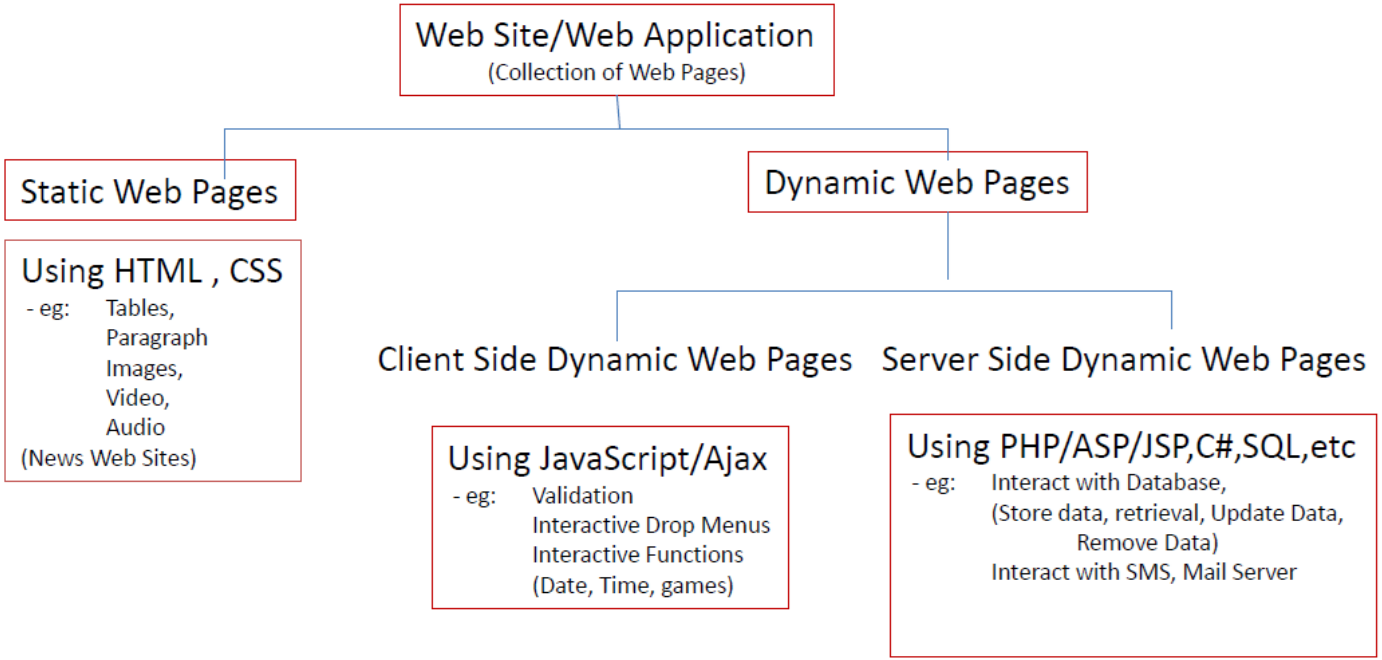
Introduction to the Internet and Web

How the Web works - Client - Server architecture



Introduction to the Internet and Web

Static vs Dynamic Web Pages



What is HTML?

- HTML, which stands for **Hypertext Markup Language**, is the standard language used for creating and designing the structure of a web page.
- It allows to organize content on the website, define its structure, and establish the relationships between different elements.
- HTML uses "markup" to annotate text, images, and other content for display in a Web browser.

HTML Versions and HTML5

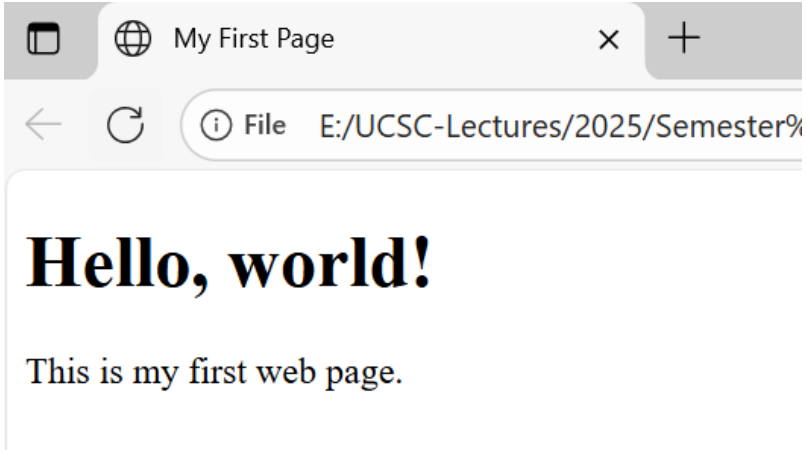
- HTML has evolved over time
  - HTML 1.0 (1993) – basic structure
  - HTML 4.01 (1999) – more formatting
  - **HTML5** (2014) – modern, semantic, multimedia friendly
- HTML5 introduced,
  - Simplified <!DOCTYPE html> declaration
  - New semantic tags: <header>, <footer>, <article>, <section>
  - Support for audio, video, canvas, and form enhancements

Basic HTML Document Structure

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

How to Create and Save an HTML File

- Use Notepad, VS Code, or any text editor
- Save with .html extension (e.g., index.html)
- Double-click to open in browser



Thank You!