OCTOBER UNIVERISTY
FOR MODERN SCIENCES AND ARTS
جامعة أكتوبر للعلوم الحديثة والآداب

CS 283
Web Programming

Fall 2022/2023

Dr. Nehal M. Ali

Welcome to CS 283/383

- **Instructor**: Dr. Nehal M. Ali
- **Office**: Building H, Room 414
- **Office Hours:** Monday 2:00 – 3:30

  Tuesday 9:30 – 11:00
- **Email**: nmali@msa.edu.eg

Course Objectives

- By the end of this course, you will be able to:
  - Design and implement a professional website
  - Develop web pages using HTML
  - Make stylistic decisions with CSS
  - Create interactive websites with JavaScript
  - Enhance interactive websites with AJAX and XML
  - Create dynamic web pages with PHP.
  - understand and implement the handling of a backend DB.

Course Objectives (cont.)

- By the end of this course, you will be able to:
  - Create your own web programming portfolio
  - Speak the web programming lingo
  - Have fun with web programming!

Why do you need CS 283?

- Web Development is extremely important for your career development.
- Scripting languages is a core in many integration platforms.
- Move to Mobile Development.

Quick Poll ! ☺

Please login to https://nearpod.com/

Use the code given by your instructor

Lectures

- Lectures will be interactive. This means:
  - You will need to study the new material before every lecture (slides, book, and online material)
  - We will have a lab on every week, so you will need to code in almost every lecture
  - You will post your questions on the discussion board before each lecture. If you do not post any questions, I assume you have understood everything. Therefore…
  - You may be called in class to explain the material to your classmates

Course Plan

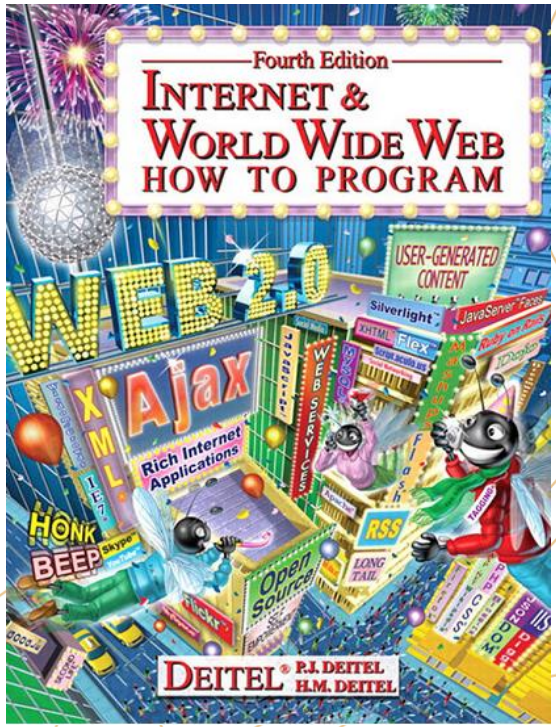
Week#	Topic
Week 1	Introduction
Week 2	HTML Basics
Week 3	Cascading Style Sheets CSS
Week 4	JavaScript
Week 5	Jquery
Week 6	Document Object Model
Week 7	Midterm Exam
Week 8	Dynamic HTML
Week 9	XML
Week 10	Back-end Database Support
Week 11	Web Hosting
Week 12	Projects Delivery
Week 13	Final Revision
Week 14	Final Exam

How to get help

- Join my office hours
- Or set an appointment with me via e-mail
- Use the textbook:

  “Internet & World Wide Web HOW TO PROGRAM”

  by MP. J. Deitel and H. M. Deitel



Grading

Quizzes	15%
Lab	20%
Project	25%
Final exam	40%
Total	100%

- Homework and Programming projects will be posted online on the Moodle

Your Project Development

- You can start working on this from the first week of the class
- Design and implementation of a professional website:
  - Professional Style
  - Interactive
- You can complete the project in teams of two/three

Project Specifications

- Your project should the following features:
  1. **HTML/CSS**- Enhanced and standardized look and feel.
  2. **AJAX** - use AJAX to turn your web pages into dynamic web applications.
  3. **PHP** – Server-side logic.
  4. **HTML and XML** - use for data and information storage and transmission.
  5. **Design & Evaluate** - think carefully about how users will use your site, design a great interface, and evaluate it with real people.
  6. **JavaScript**- use to provide validation and verification to the web content.
  7. **Connect to a DB.**
  8. **Have a proper documentation.**

Homework and Labs

- It will involve:
  - Applying what we learned in class
  - Clean design and coding
  - Clear documentation
- Homework will be completed *individually*

Policies

- Cheating means “submitting, without proper attribution, any computer code that is directly traceable to the computer code written by another person.”
- Or even better:
  - ***“Any form of cheating, including concealed notes during exams, copying or allowing others to copy from an exam, students substituting for one another in exams, submission of another person’s work for evaluation, preparing work for another person’s submission, unauthorized collaboration on an assignment, submission of the same or substantially similar work for two courses without the permission of the professors. Plagiarism is a form of Academic Misconduct that involves taking either direct quotes or slightly altered, paraphrased material from a source without proper citations and thereby failing to credit the original author. Cutting and pasting from any source including the Internet, as well as purchasing papers, are forms of plagiarism.”***
- I give students a failing homework grade for *any* cheating.
- A second cheating attempt will be escalated higher level of punishment.

Policies

- You may discuss homework problems with classmates, after you have made a serious effort in trying the homework on your own.
- You can use ideas from the literature (with proper citation).
- You can use anything from the textbooks/notes.
- The code you submit **must be written completely by yourself**.
- Your activities in lab will be considered for the coursework evaluation.

Policies

- Read the collaboration policy carefully.
- Late policy:
  - Late assignments will be accepted (up to 48 hours) but you will be penalized 10% per each late day.

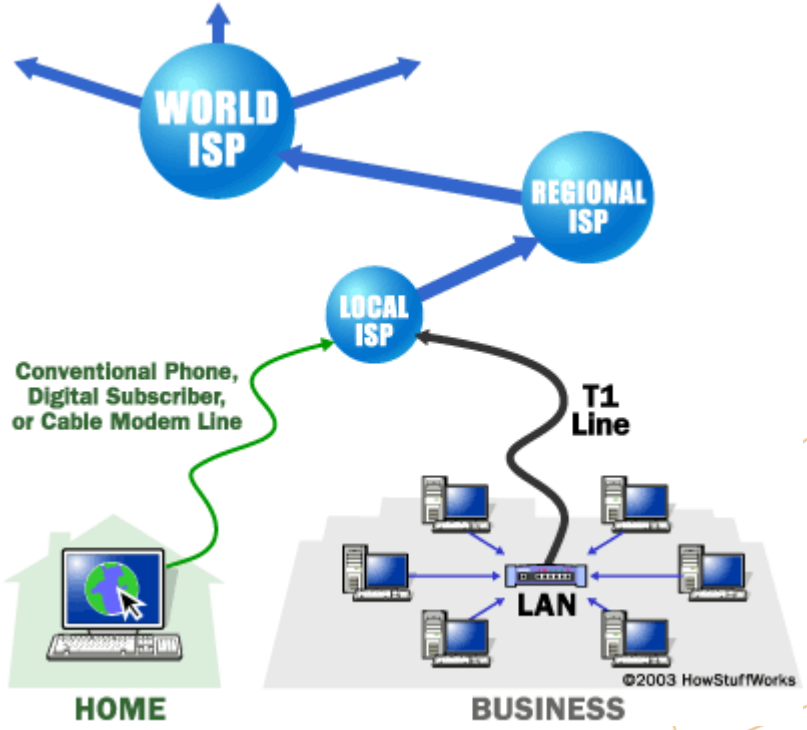
Tools and Editors

- Editors
  - Textpad
  - Notepad ++
  - Visual Studio Code
- Web Server
  - XAMP

Course Introduction

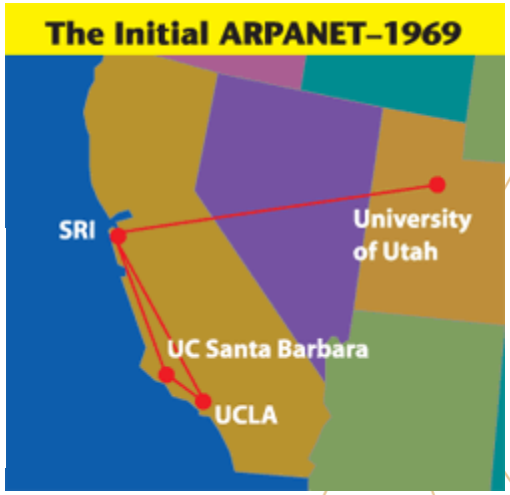
What is the internet?

- A collection of computer networks that use a protocol to exchange data
- Is the World Wide Web (WWW) and the internet the same?



Brief history

- Began as a US Department of Defense network called ARPANET (1960s-70s)
- Packet switching (in the 60s)
- E-mail is born on 1971
- TCP/IP beginning on 1974 (Vinton Cerf)
- USENET (1979)
- By 1987: Internet includes nearly 30,000 hosts



Brief history (cont.)

- WWW created in 1989-91 by Tim Berners-Lee
- Popular web browsers released:
  - Netscape 1994
  - IE 1995
- Amazon.com opens in 1995
- Google January 1996
- Wikipedia launched in 2001
- MySpace opens in 2003
- Facebook February 2004

The future of the internet?

What will the internet look like in 2040?

http://www.bbc.com/future/story/20141015-will-we-fear-tomorrows-internet

15 predictions for the future of the Internet

http://www.pbs.org/newshour/rundown/15-predictions-future-internet/

Key aspects of the internet

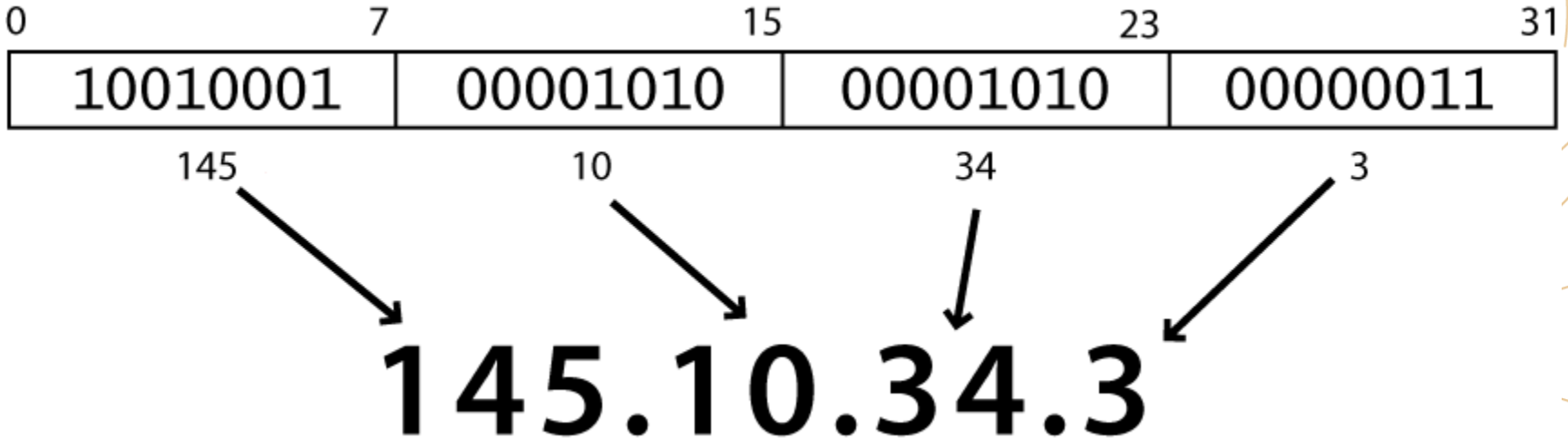
- Sub-networks are independent
- Computers can dynamically join and leave the network
- Built on open standards
- Lack of centralized control (mostly)
- Everyone can use it with simple, commonly available software

People and organizations

- Internet Engineering Task Force (IETF): internet protocol standards
- Internet Corporation for Assigned Names and Numbers (ICANN): decides top-level domain names
- World Wide Web Consortium (W3C): web standards

Internet Protocol (IP)

- Simple protocol for **data exchange** between computers
- IP Addresses:
  - 32-bit for IPv5
  - 128-bit for IPv6

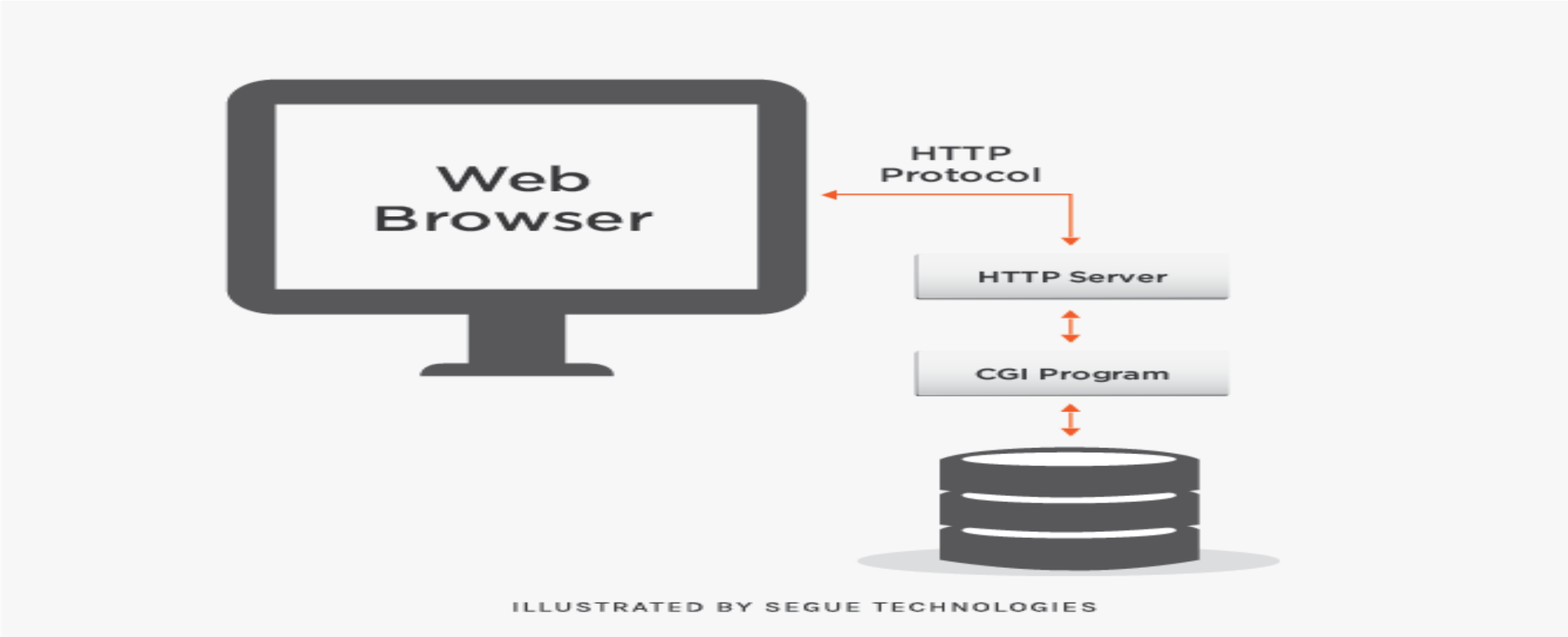


Web Applications

- All type of applications that has some parts hosted within a web browser.

https://developer.mozilla.org/en-US/docs/Learn/Server-side/First_steps/Client-Server_overview/basic_static_app_server.png

Client / Server structure

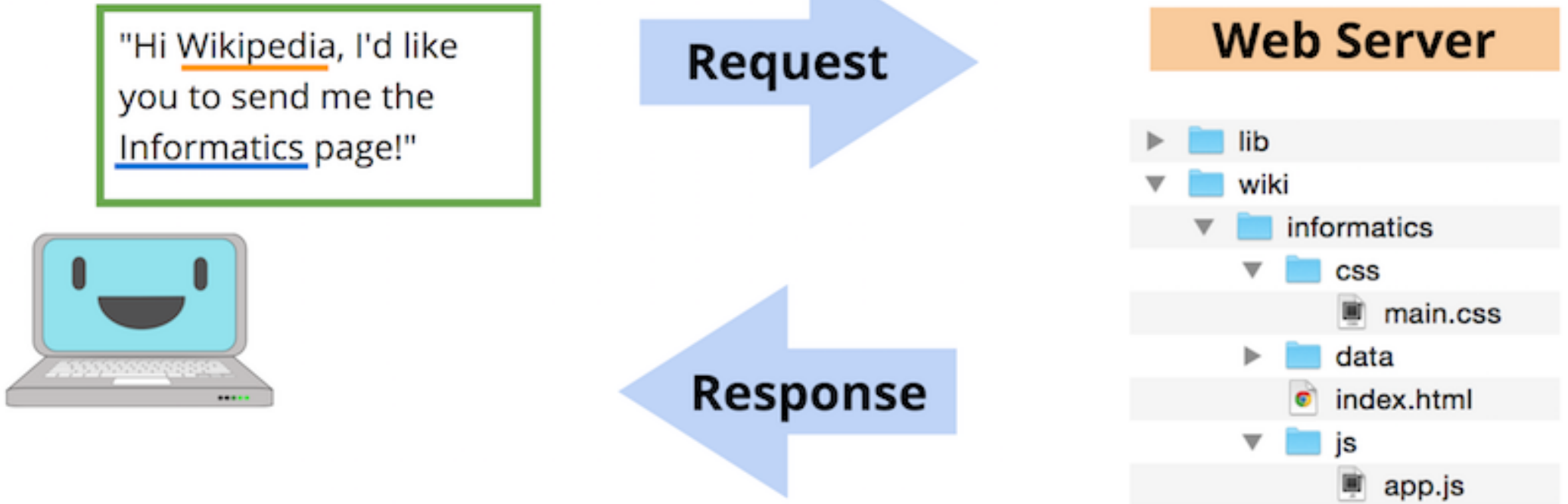


https://www.seguetech.com/client-server-side-code/#:~:text=The%20%E2%80%9Cclient%E2%80%9D%20is%20a%20web,or%20on%20the%20web%20server.

The common gateway interface (CGI)

- A **standard way for a Web server to pass a Web user's request to an application program and to receive data back to forward to the user**.
- Can be written in any programming language

Client – Server communication



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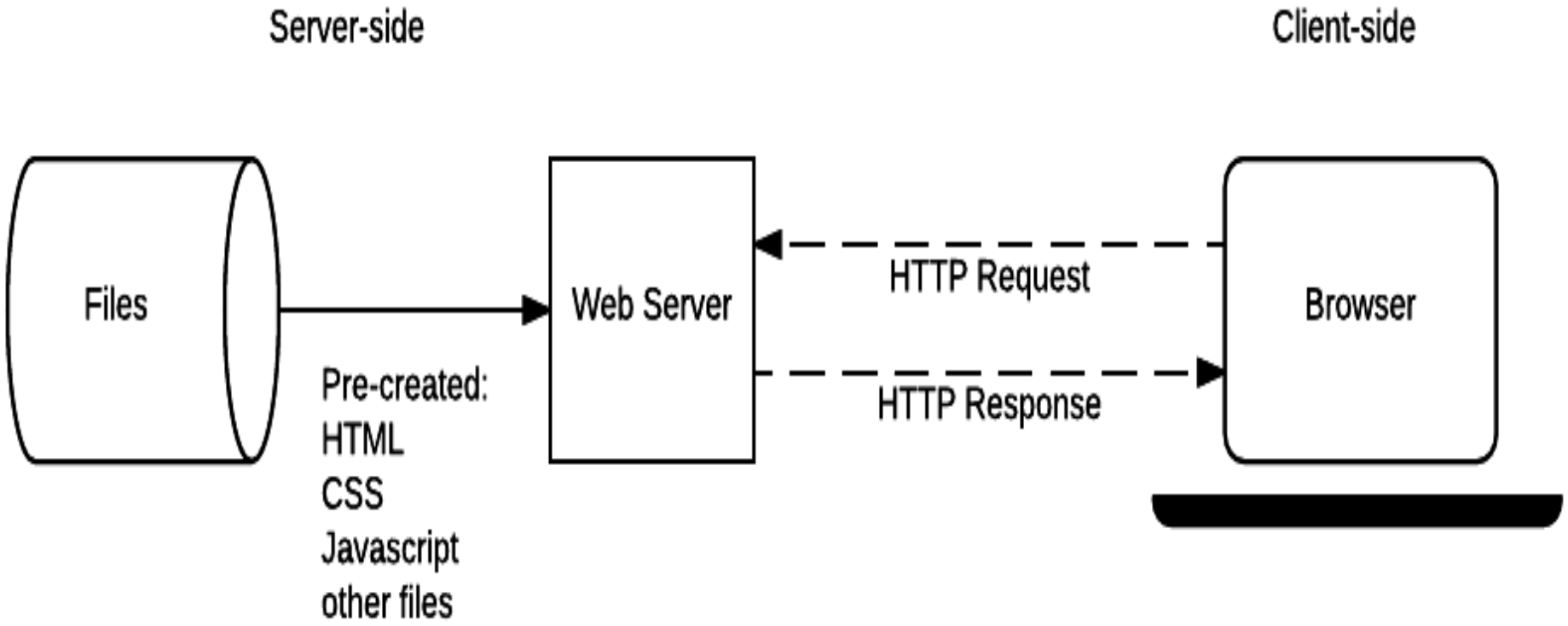


https://developer.mozilla.org/en-US/docs/Learn/Server-side/First_steps/Client-Server_overview/basic_static_app_server.png

Web Terminologies

What is an IP Address

- A unique identifier assigned to each and every device over the internet.
- Primarily used to identify and track devices accross the network.

Public IP

identifies you to the wider internet so that all the information you're searching for can find you

Private IP

used within a private network to connect securely to other devices within that same network

What is cybersecurity?

What is Cyber security?

- It is the procedures of protecting a computer and data from unauthorized access, use, or disclosure.
- Cyber security includes:
  - antivirus software,
  - Updating the operating system and applications regurarely
  - Installing firewalls and password managers
  - Data encryption.

Uniform Resource Locator (URL)

- Identifier for the location of a document on a web site
  - Example: http://dept.ju.edu/cs/index.html
- Upon entering this URL into the browser, it would:
  - ask the **DNS server for the IP** address of dept.ju.edu
  - connect to that IP address at port 80
  - ask the server to GET /cs/index.html
  - display the resulting page on the screen

Hypertext Transport Protocol (HTTP)

- Set of commands understood by a web server and sent from a browser
- Some HTTP commands (your browser sends these internally):
  - GET filename : download
  - POST filename : send a web form response
  - PUT filename : upload
- Exercise: simulate a browser with a terminal window

HTTP Error Codes

- When something goes wrong, the web server returns a special "error code" number
- Common error codes:

Number	Meaning
200	OK
301-303	page has moved (permanently or temporarily)
403	you are forbidden to access this page
404	page not found
500	internal server error

Internet Media ("MIME") types

MIME (Multipurpose Internet Mail Extensions) type	file extension
text/html	.html
text/plain	.txt
image/gif	.gif
image/jpeg	.jpg
video/quicktime	.mov
application/octet-stream	.exe

Test your Knowledge

Please login to https://nearpod.com/

Use the code given by your instructor

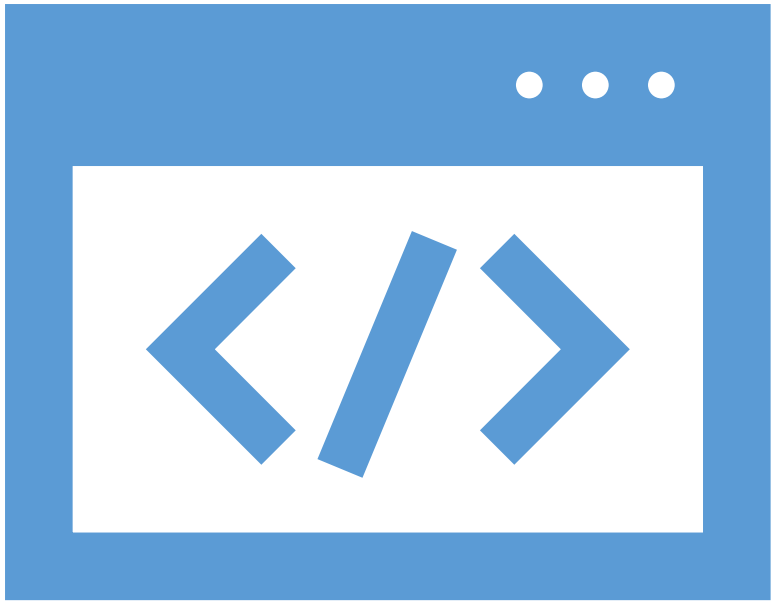
Introduction to website Development

website development

- Website development is the process of designing, building, and maintaining a website.
- Websites are necessary for all sizes of businesses to connect with customers.

Web Development Basics

- **HTML**
- CSS
- Web Server



HTML

- HTML is the basic block of all websites.
- a markup language to style the website's content and structure.
- To create pages with text, photos, videos, and embedded objects.

```
1   <!DOCTYPE html>
2   <html>
3     <head>
4       <meta charset="UTF-8">
5       <title>Title goes here</title>
6     </head>
7     <body>
8
9     </body>
10  </html>
```

Cascading Style Sheets (CSS)

- A great tool for styling a website's images , videos and text .
- Can be used to change the color, size, and layout of the website's elements.
- JavaScript is a programming language that can be used to create an interactive website.

web servers

- A web server is the computer system where the website is located.
- Web servers avails the required hardware (e.g. Internet connection) and software (e.g. HTML5) to **build and access** a website.
- Examples for Webservers:
  - Microsoft's Web Server, IIS
  - Apache Web Server
  - Tomcat web server

Types of Web Development

- Front-end development
- Back-end development
- Full stack development.

Front-End Development

- 1. Developing and Designing the graphical user interfaces (GUIs).
- 2.Developing and testing web pages using HTML, CSS, and JavaScript.
- 3. Building custom animations and for websites and web applications.
- 4. Applying tests to assess the efficiency and reliability of a website or application's user interface.

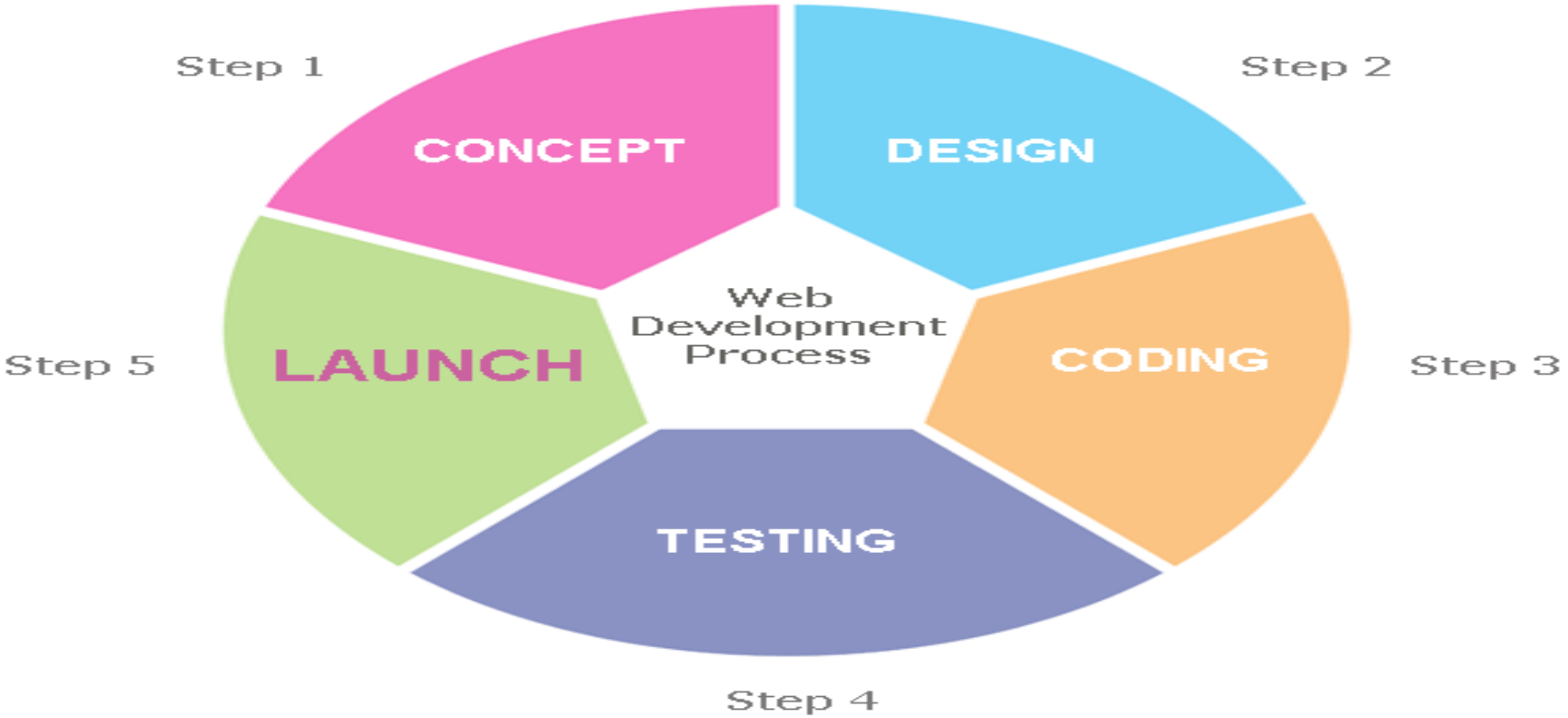
Back-End Development

- A vital component of web application.
- Responsible for ensuring that the system is meeting all the requirements and is working as expected.
- Responsible for ensuring that all required data is accessible by the system's users and that it is securely stored.
- Requires high programming skills and sufficient knowledge of web technologies such as PHP, Java script, HTML, and CSS.

Full-stack development

- The entire process of developing a web application from start to finish.
- This process includes the design, development, testing and deployment of all the necessary components.

The Website Development Process



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