# Web and Cloud Application Development

# Lab/Activity 1

Course Learning Outcome: CLO1

- Discuss Technologies, languages & frameworks to Implement Web Applications.

Chapters: Chapter 1

Cognitive Levels: Understand

Aim: The student should be able to:

* Understand the difference between the Internet and the Web
* Explain how the Web works
* Identify what a web server does
* Identify what a web client does
* Identify the differences between current and emerging Web Technologies

Tools: Laptop, pen papper, internet for doing research

# [MCQ- UNDERSTAND]

1. What is the domain name in the following URL: http://www.mystore.com:80/products/index.jsp

a. mystore.com

b. http

c. products

d. index.jsp

1. Which of the following statement is TRUE about a HTTP Post request?
   1. In a HTTP Post request, the data is sent inside the body of the message
   2. The data sent in a HTTP Post request is appended to the URL
   3. HTTP Post is less secure than HTTP GET Request
   4. Using HTTP Post method you cannot send a large amount of data

# Exercise 1- UNDERSTAND

Analyze the given URL: https://www.dbs.ie/course/postgraduate/master-of-science-(msc.)-in-artificial-intelligence

Identify each of the following:

Protocol? = https://

Domain/host? = www.dbs.ie

Path? /course/postgraduate/master-of-science-(msc.)-in-artificial-intelligence

Resource? master-of-science-(msc.)-in-artificial-intelligence

Query string?

Parameter/Value Pairs?

# Exercise 2- UNDERSTAND

Analyze the given URL: <https://some.com/vehicles/trucks/mazda.php?model=2017&type=used>

Identify each of the following:

* 1. Protocol? = https:
  2. Domain/host? = some.com
  3. Path? = [vehicles/trucks/mazda.php?model=2017&type=used](https://some.com/vehicles/trucks/mazda.php?model=2017&type=used)
  4. Resource? = mazda.php
  5. Query string? = model=2017&type
  6. Parameter/Value Pairs? Model 2017 & Type=used

# Exercise 3 - UNDERSTAND

What is the Client/Server principle? How are the WWW documents accessed in Client/Server model?

1. User requests a Web document over the Web client browser (entering a URL or on a mouse click)

2. Browser checks the DNS Server to get back the IP address of the Web Server

3. Browser contacts the Web server specified by the URL and requests the desired document

Server accesses its local file system and sends the file specified in the URL through HTTP response to the requesting host

Browser receives the document, interprets the document and displays it

# Exercise 4 - UNDERSTAND

Why is HTTP is considered to be a stateless protocol?

HTTP (HyperText Transfer Protocol) is considered a **stateless protocol** because it does not retain any information about previous requests or interactions between the client and server.

# Exercise 5 - UNDERSTAND

Write a note on some differences between client-side and server-side technology.

Client-side technologies run on the user's device (e.g., a web browser) and handle the presentation and interactivity of a web application.

# Exercise 6 - UNDERSTAND

Write down 3 Client-side programming technologies to create dynamic contents.

JavaScript

React

Vue.JS

# Exercise 7 - UNDERSTAND

Write down 3 Server-side programming languages used to create dynamic contents.

PHP: A classic choice for server-side scripting.

Python (Django/Flask): Versatile and powerful for web development.

Node.js: Enables JavaScript to be used for server-side programming, ideal for real-time applications.

**HOMEWORK TASK:**

# Exercise 8 - UNDERSTAND

Analyzing http requests in Web Browser:

-Run Firefox (or Chrome), go to **Network** tab in Developer Tools.

-Enter URL <http://www.hct.ac.ae> in address bar, press enter and answer the following questions:

-What is the total number of requests to the server?

23 Requests

-What are the different http methods used in requests?

GET: Used to retrieve resources (e.g., HTML, CSS, JS, images).

POST: Used to send data to the server (if applicable).

Other methods like HEAD, PUT, or DELETE may also appear depending on the website's functionality.

-What are the total number of requests for each of the following document types (content-type): HTML, CSS, JS, and Images? You can see them by selecting the specific tag.

HTML: Look for document or text/html.

CSS: Look for stylesheet or text/css.

JS: Look for script or application/javascript.

Images: Look for image (e.g., image/png, image/jpeg).

-What are the different status codes for requests?

200 OK: The request was successful.

301 Moved Permanently: The resource has been permanently moved to a new URL.

304 Not Modified: The resource has not been modified since the last request.

404 Not Found: The requested resource could not be found.

500 Internal Server Error: The server encountered an error.

-Check **Headers**, **Params**, and **Response** tabs of one request for each of the following content type: html, css, js, images.

Headers: Shows request and response headers, including the HTTP method, URL, status code, and content type.

Params: Displays query parameters or form data sent with the request (if applicable).

Response: Shows the content returned by the server (e.g., HTML code, CSS, JS, or image data).

# Exercise 8 - UNDERSTAND

List down 5 classes of HTTP status codes and write two codes for each class with code details.

1xx –Informational Messages

Provisional response just for information. Example: 101 Switching Protocols Client asks to switch protocol, server acknowledges to do so

2xx –Success

Codes indicate that the server could receive and process the request successfully. Example: 200 OK

3xx –Redirection

Codes indicate that clients must perform an additional action(e.g. additional request) to receive the actual resource

Example: 301 Moved Permanently

4xx –Client Error

Codes indicate that the client request is erroneous, i.e. mal-formed or requesting a non-existent or unauthorized resource

Example: 400 Bad Request The client’s request was syntactically malformed

5xx –Server Error

The client’s request was valid, but the server was not able to fulfill the request –and knows that the reason is server-side

Example: 503 Service Unavailable - Server could (temporarily) not answer request, e.g. due to overload

# Exercise 9 - UNDERSTAND

Write a short note explaining how the following technologies are different: HTML, CSS, JavaScript, and ASP .NET

HTML is the standard markup language used to create the structure and content of web pages.

CSS is used to style and format the visual presentation of HTML elements.

JavaScript is a programming language that adds interactivity and dynamic behavior to web pages.

ASP.NET is a server-side web application framework developed by Microsoft for building dynamic websites, web applications, and web services.