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Task 0 - Basics of HTTP/HTTPS

1. Summary: HTTP vs. HTTPS

HTTP (HyperText Transfer Protocol) and HTTPS (HyperText Transfer Protocol Secure) are both protocols used for transmitting data between a client (such as a web browser) and a web server. The main difference lies in security. HTTP transmits data in plain text, which makes it vulnerable to interception and tampering. HTTPS, on the other hand, adds a layer of security by using SSL/TLS encryption, ensuring that data remains confidential and unaltered during transmission.

Feature	HTTP	HTTPS
Encryption	No encryption	Encrypted with SSL/TLS
Default Port	80	443
Security	Vulnerable to attacks	Secure and reliable
Use Cases	Static websites, non-sensitive content	Login forms, banking, APIs

2. HTTP Request and Response Structure

Example of an HTTP Request:

> *GET /api/v1/users HTTP/1.1*
> *Host: example.com*
> *User-Agent: curl/7.81.0*
> *Accept: application/json*

Example of an HTTP Response:

> *HTTP/1.1 200 OK*
> *Date: Sun, 15 Jun 2025 12:00:00 GMT*
> *Server: nginx/1.18.0*
> *Content-Type: application/json*
> *Content-Length: 123*

{"user_id": 1, "name": "John"}

3. Common HTTP Methods

List of commonly used HTTP methods:

- Method: GET

Description: Retrieves data from the server.

Use case: Fetching a list of blog posts.

- Method: POST

Description: Sends data to the server to create a resource.

Use case: Submitting a registration form.

- Method: PUT

Description: Updates an existing resource.

Use case: Editing a user profile.

- Method: DELETE

Description: Removes a resource from the server.

Use case: Deleting a comment.

4. Common HTTP Status Codes

List of commonly encountered HTTP status codes:

- Status Code: 200 - OK

Scenario: The request was successful and the server responded with the requested data.

- Status Code: 201 - Created

Scenario: The request was successful and a new resource was created.

- Status Code: 400 - Bad Request

Scenario: The server could not understand the request due to invalid syntax.

- Status Code: 404 - Not Found

Scenario: The requested resource could not be found on the server.

- Status Code: 500 - Internal Server Error

Scenario: The server encountered an error and could not complete the request.