**Frontend Assignment Set**

*Module 1 – Foundation*

**THEORY EXERCISE:**

• 1) What is HTTP?

**🡪HTTP** stands for **H**yper **T**ext **T**ransfer **P**rotocol.

**🡪** It's the foundation of data communication for the World Wide Web, enabling the transfer of data between a client (like a web browser) and a server.

**🡪 HTTP Request / Response**

Communication between clients and servers is done by requests and responses:

• 2) What are Browsers? How do they work?

**🡪** The web browser is an application software used to explore the World Wide Web **(WWW).**

**🡪** It acts as a platform that allows users to access information from the Internet by serving as an interface between the **client (user) and the server**.

•3) What is Domain name?

🡪 Domain names are a key part of the Internet infrastructure. They provide a human-readable address for any web server available on the Internet**.**

**🡪e.g., 192.0.2.172)**

• 4) What is hosting?

🡪Web hosting is what makes your website visible on the internet. It stores your website’s files on special computers called servers and delivers them to visitors when they type in your domain name.

**Module 2 – Fundamentals of Worldwide**

***THEORY EXERCISE:***

* **1)**Difference between Web Designer and Web Developer

**Web Designer** **Web Developer**

🡪Web Designers are very creative. 🡪 Web Developers are More Technical.

🡪They transform the ideas into 🡪 They transform design

Visually appending designs. Into fully functional

Websites.

🡪 User Experience (UX) 🡪 Front-end

User Interface (UI) Back end

Visual/Graphic Designer Full stack

**Module 3 – Fundamentals of IT**

* **What is a Program?**

**THEORY EXERCISE:**

-Explain in your own words what a program is and how it functions.

🡪 A program is instructions for a computer to execute specific tasks.

🡪It contains code written in a programming language which may be interpreted, compiled or assembled into machine readable form and then executed.

* **What is Programming?**

**THEORY EXERCISE:**

-What are the key steps involved in the programming process**?**

**🡪** The key steps in the programming process are:

1) Understanding the problem and defining its requirements,2) Designing a solution,

3) Coding the solution,

4) Testing and debugging the code,

5) Documenting the program and

6) Maintaining the program.

* **Types of Programming Languages**

**THEORY EXERCISE:**

**-**What are the main differences between high-level and low-level programming languages?

🡪 **High-Level Language**

A **high-level language (HLL)** is a human-readable programming language that simplifies coding by hiding complex hardware details, letting developers focus on logic and functionality.

🡪 **Low-Level Language**

A **low-level language** is a machine-oriented programming language that provides minimal abstraction from hardware, offering direct control over memory and system resources for maximum performance and efficiency.

* **World Wide Web & How Internet Works**

**THEORY EXERCISE:**

-Describe the roles of the client and server in web communication.

🡪 The client (browser) sends requests to the server to access web pages, images, videos, or other resources.

🡪 The server sends back the requested data or a response message to the client.

* **Network Layers on Client and Server**

**THEORY EXERCISE:**

-Explain the function of the TCP/IP model and its layers.

🡪 The TCP/IP model is a conceptual framework that structures how data is transmitted over networks. It divides the communication process into four layers: Application, Transport, Internet, and Network Access. Each layer handles specific tasks, ensuring reliable and efficient data exchange between devices.

* **Client and Servers**

**THEORY EXERCISE:**

- Explain Client Server Communication

🡪 Client-server communication is a network architecture where a client (a device or application) requests resources or services from a server (a more powerful computer). The server then processes the request and sends back a response to the client.

* **Types of Internet Connections**

**THEORY EXERCISE:**

-How does broadband differ from Fiber-optic internet?

🡪 Broadband is a general term for high-speed internet access, while Fiber optic internet is a specific type of broadband technology that uses thin glass or plastic Fibers to transmit data.

🡪 Fiber optic internet is generally faster and more reliable than other types of broadband like DSL or cable, which use copper wires.

* **Protocols**

**THEORY EXERCISE:**

-What are the differences between HTTP and HTTPS protocols?

🡪 HTTP has been the most widely used protocol for data transfer over the Web. It is not used for secure communication.

🡪 Hypertext Transfer Protocol Secure (HTTPS) is an extended version of the Hypertext Transfer Protocol (HTTP). It is used for secure communication.

* **Application Security**

**THEORY EXERCISE:**

- What is the role of encryption in securing application, Software Applications and Its Types.

🡪 Encryption's primary role is to protect sensitive information by converting it into an unreadable format, ensuring confidentiality and integrity, even if intercepted or stolen. It safeguards data both in transit and at rest, making it crucial for maintaining privacy and security in various applications.

🡪 There are two main types of encryptions: symmetric and asymmetric.

-What is the difference between system software and application software?

🡪 [System Software](https://www.geeksforgeeks.org/computer-science-fundamentals/system-software/) is the type of software that is the interface between application software and the system. (Ex.Operating System)

Low-level languages are used to write the system software.

🡪 [Application Software](https://www.geeksforgeeks.org/computer-science-fundamentals/what-is-application-software/) is the type of software that runs as per user request. It runs on the platform which is provided by system software. (Ex.Customized Software)

High-level languages are used to write the application software.

* **Software Architecture**

**THEORY EXERCISE:**

- What is the significance of modularity in software architecture?

🡪 Modularity in software architecture is significant because it enables breaking down complex systems into smaller, manageable, and independent components (modules).

* **Layers in Software Architecture**

**THEORY EXERCISE:**

-Why are layers important in software architecture?

🡪 In software architecture, layers act as individual processes within the infrastructure of an application. These layers typically form a pattern, also called the n-tier architecture pattern.

* **Softwre Environments**

**THEORY EXERCISE:**

- Explain the importance of a development environment in software production.

🡪 A development environment is crucial in software production as it provides a dedicated workspace for developers to write, test, and refine code without affecting live, production systems.

* **Source Code**

**THEORY EXERCISE:**

- What is the difference between source code and machine code?

🡪 Source code is human-readable instructions written in a programming language.

🡪 machine code is the low-level binary code that a computer's processor directly executes.

* **Github and Introductions**

**THEORY EXERCISE:**

- Why is version control important in software development?

🡪 Version control is crucial in software development because it tracks changes to code, facilitating collaboration, allowing for easy rollback to previous versions, and enabling efficient conflict resolution.

* **Student Account in GitHub**

**THEORY EXERCISE:**

- What are the benefits of using GitHub for students?

🡪 GitHub provides students with a powerful platform for collaboration, version control, and access to valuable resources.

🡪 It enables students to work on projects together, track changes to their code, and gain practical experience.

* **Types of Software**

**THEORY EXERCISE:**

- What are the differences between open-source and proprietary software?

🡪 Open-Source software is the software that is *available to users with source code*. Source code is a part of a program or software. (Ex. database system)

🡪 Proprietary software is computer software where the source codes are publicly not available only the company that has created them can modify it. (Ex. Microsoft Office)

* GIT and GITHUB Training

**THEORY EXERCISE:**

- How does GIT improve collaboration in a software development team?

🡪 Git significantly improves collaboration in software development teams through its version control capabilities and streamlined workflows.

🡪It allows developers to work on different parts of a project concurrently without interfering with each other's work, facilitates easy merging of changes, and provides a clear history of all modifications.

* **Application Software**

**THEORY EXERCISE:**

- What is the role of application software in businesses?

🡪 Application software plays a vital role in businesses by providing tools to enhance efficiency, automate tasks, manage data, and improve communication. It helps businesses manage various aspects like customer interactions.

* **Software Development Process**

**THEORY EXERISE:**

-What are the main stages of the software development process?

🡪 The software development process, also known as the Software Development Life Cycle (SDLC), typically includes these main stages: Planning, Analysis, Design, Development, Testing, Deployment, and Maintenance.

* **Software Requirement**

**THEORY EXERCISE:**

- Why is the requirement analysis phase critical in software development?

🡪 The requirement analysis phase is critical in software development because it ensures that the software being built aligns with the needs and expectations of its users and stakeholders.

* **Software Analysis**

**THEORY EXERCISE:**

-What is the role of software analysis in the development process?

🡪 Software analysis plays a crucial role in the development process by ensuring a clear understanding of project requirements and goals before diving into coding.

* **System Design**

**THEORY EXERCISE:**

-What are the key elements of system design?

🡪 Key elements of system design include architecture, data flow, scalability, reliability, security, performance, maintainability, and APIs/interfaces.

* **Software Testing**

**THEORY EXERCISE:**

- Why is software testing important?

🡪 software testing is essential for maintaining a high standard of quality, reliability, and security in any application.

* **Maintenance**

**THEORY EXERCISE:**

-What types of software maintenance is there?

🡪 There are four main types of software maintenance:

1)corrective,

2)adaptive,

3)perfective and

4)preventive.

* **Development**

**THEORY EXERCISE:**

-What are the key differences between web and desktop applications?

🡪 Web applications are accessed through a web browser and typically require an internet connection.

🡪 desktop applications are installed directly on a user's computer and can often function offline.

* **Web Application**

**THEORY EXERCISE:**

- What are the advantages of using web applications over desktop applications?

🡪 Web applications offer several advantages over desktop applications, primarily due to their accessibility, ease of updates, and cross-platform compatibility.

🡪They are accessible from any device with an internet connection and a web browser.

* **Designing**

**THEORY EXERCISE:**

- What role does UI/UX design play in application development?

🡪 UI/UX design plays a crucial role in application development by ensuring the application is both visually appealing and user-friendly, leading to increased user satisfaction, engagement, and ultimately, the success of the application.

* **Mobile Application**

**THEORY EXERCISE:**

- What are the differences between native and hybrid mobile apps?

🡪 Native mobile apps are built specifically for one operating system (iOS or Android) using its native programming language, offering optimal performance and access to device features.

🡪Hybrid apps, on the other hand, are built using web technologies and wrapped in a native container, allowing them to run on multiple platforms with a single codebase.

* **DFD (Data Flow Diagram)**

**THEORY EXERCISE:**

-What is the significance of DFDs in system analysis?

🡪 In system analysis, Data Flow Diagrams (DFDs) are crucial for visualizing and understanding how data moves through a system.

* **Desktop Application**

**THEORY EXERCISE:**

**-**What are the pros and cons of desktop applications compared to web applications?

🡪 Desktop applications generally offer better performance and offline functionality, but web applications are more accessible and easier to update.

* **Flow Chart**

**THEORY EXERCISE:**

- How do flowcharts help in programming and system design?

🡪 Flowcharts are valuable tools in programming and system design for visualizing the logic and flow of processes.

🡪 They aid in planning, debugging, and communication by providing a clear, step-by-step representation of algorithms, program execution, and system workflows.

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🡪

Describe the roles of the client and server in web communication.

• What is a W3C?

🡪The World Wide Web Consortium (W3C) is an international community that works together for the long-term growth of the Web.

• What is Domain?

🡪 A domain is a particular field of thought, activity, or interest, especially one over which someone has control, influence, or rights.

• What SEO?

🡪 Search engine optimization is the process of improving the quality and quantity of website traffic to a website or a web page from search engines.

• What is SDLC life cycle?

🡪 SDLC stands for Software Development Life Cycle. It is a systematic process that is commonly used by software development teams to design, develop, and test software.