

Library and Database Technology (9213)

Semester: Autumn, 2024

**Level: BS-LIS**

### **Assignment No. 1 (Units 1–5)**

#### **Q1. Creating Static Web Page Reports vs. Creating Dynamic Web Page Reports**

A **static web page report** is a fixed document created using HTML and CSS. It does not change unless manually updated. For example, an annual report published on a company's website as an HTML file is a static web page report.

A **dynamic web page report**, on the other hand, retrieves data from a database and updates automatically. It is created using server-side scripting languages like PHP, ASP.NET, or JavaScript frameworks. For example, an e-commerce website showing real-time stock availability is dynamic.

#### **Q2. Database Management Approaches**

**Hierarchical Database Approach** – Uses a tree-like structure (e.g., IBM's IMS).

**Network Database Approach** – Allows multiple relationships using sets (e.g., CODASYL DBMS).

**Relational Database Approach** – Uses tables (e.g., MySQL, PostgreSQL).

**Object-Oriented Database Approach** – Stores data as objects (e.g., MongoDB, ObjectDB).

### **Q3. Discussion Topics**

**Open-Source Software** – Freely available software with source code access (e.g., Linux, MySQL).

**MySQL vs. PostgreSQL** – MySQL is known for speed and ease of use, while PostgreSQL offers advanced features like ACID compliance and better concurrency control.

**Loading the Data** – The process of inserting data into a database from various sources.

**Creating Data Structures** – Defining tables, columns, indexes, and relationships in a database.

#### **Q4. Defining Data, Offloading Data-Text File, Implementing Data Model**

**Defining Data** – Structuring data types, constraints, and schema before storing them in a database.

**Offloading Data-Text File** – Exporting database contents into text formats such as CSV, JSON, or XML.

**Implementing Data Model** – Creating an actual database based on a logical model.

#### **Q5. Processes of Creating Reports**

**Data Collection** – Gathering required data.

**Data Processing** – Cleaning and organizing data.

**Data Visualization** – Using tools like Tableau or Power BI to present reports.

**Generating Reports** – Exporting reports as PDFs, Excel sheets, or web-based dashboards.

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## **Assignment No. 2 (Units 6–9)**

### **Q1. Steps in Programming an Application**

**Requirement Analysis** – Understanding user needs.

**Design** – Creating wireframes and database models.

**Development** – Writing and testing code.

**Testing** – Identifying and fixing bugs.

**Deployment** – Releasing the application.

**Maintenance** – Updating features and fixing errors.

### **Q2. Creating the Main Application**

**Setting Up the Development Environment** – Installing necessary tools and libraries.

**Designing User Interface** – Using HTML, CSS, and JavaScript.

**Backend Development** – Writing server-side logic with PHP, Node.js, etc.

**Database Integration** – Connecting the application to a database.

**Testing and Debugging** – Ensuring application stability.

### **Q3. Database-Related Security Techniques**

**Access Control** – Restricting unauthorized access.

**Data Encryption** – Protecting sensitive data.

**SQL Injection Prevention** – Using parameterized queries.

**Regular Backups** – Preventing data loss.

### **Q4. User Interface and Its Elements**

A **user interface (UI)** is how users interact with software.

Major elements include:

**Navigation Menus** – Allow easy movement.

**Forms and Input Fields** – For user interaction.

**Buttons and Controls** – Enable user actions.

**Typography and Colors** – Improve readability.

## **Q5. Short Notes**

**Query Logging** – Recording database queries for analysis.

**Input Validation** – Ensuring user input is correct.

**Database Maintenance Functions** – Tasks like indexing, updating statistics, and removing redundant data.

**Checking for Duplicates/Fields with Data Integrity** – Ensuring unique records and enforcing constraints to maintain accuracy.

This document provides a comprehensive overview of the assignments and ensures clear understanding.