Assignment 5

Title:

"To enhance the understandability of concepts related to Java Servlets"

Objective:

The objective of this assignment is to help students understand the core concepts of Java Servlets, including **CGI vs Servlets, Servlet API, HttpServletRequest & HttpServletResponse, ServletConfig, ServletContext, Session Management, RequestDispatcher, and Filters**, by implementing a functional web application.

Assignment Tasks:

1. Understanding CGI vs Servlets (Theory & Practical Implementation)

- Write a **brief explanation** comparing **CGI and Servlets** (advantages of Servlets over CGI).
- Implement a **simple CGI program** (using Python or Perl) to handle a form submission.
- Implement the **same functionality using Java Servlets** to observe performance differences.

---

2. Servlet API & Basic Servlet Implementation

- Create a **basic Java Servlet** that handles a GET request and displays a welcome message.
- Implement `doGet()` and `doPost()` methods.
- Demonstrate the use of **HttpServletRequest & HttpServletResponse** by:
    - Retrieving **query parameters** from the URL.
    - Displaying client request details (IP Address, User-Agent, etc.).

---

3. ServletConfig & ServletContext

- Implement **ServletConfig** to read **initialization parameters** from `web.xml` (e.g., database connection settings).
- Use **ServletContext** to store **application-wide data** and share it across multiple servlets.

---

4. Session Management in Servlets

- Implement **Session Tracking** using:
  ✓ **Cookies** (Store username and retrieve it on another page).
  ✓ **URL Rewriting** (Pass session ID through the URL).
  ✓ **HttpSession API** (Store user preferences like theme or language).

---

5. RequestDispatcher & Servlet Communication

- Create a **login system** where:
  - The **LoginServlet** validates user credentials.
  - If correct, forward the request to a **WelcomeServlet** using `RequestDispatcher.forward()`.
  - If incorrect, redirect back to the login page with an error message.

---

6. Implementing Servlet Filters

- Create a **logging filter** that logs every request (IP Address, time, requested URL).
- Create an **authentication filter** that restricts access to a protected page unless the user is logged in.

Advance topics

✓ Implement a **database connection (JDBC)** to validate users in the login system.
✓ Create a **servlet-based MVC framework** where Servlets handle logic, JSP handles presentation, and a database stores user data.
✓ Implement an **AJAX-based form submission** where the servlet returns a JSON response.

Expected Outcome:

By completing this assignment, students will gain practical knowledge of **Java Servlets, HTTP request/response handling, session management, inter-servlet communication, and security with filters**.