WT Assignment - 8
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Aim:
Write a program to create three-tier applications using JSP and Databases in Java for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

Theory:

What is JSP?

Ans: JSP, or JavaServer Pages, is a technology used for developing web pages that support dynamic content. It helps developers insert java code in HTML pages by using special JSP tags, most of which start with <% and end with %>. A JSP is compiled into a Java servlet before being run on the server, so it acts much like a regular servlet by generating HTML or XML format data in response to a request.

What are the uses and advantages & disadvantages of it?

Advantages:
1. **Ease of Use**: Developers can quickly build dynamic web pages by embedding Java code directly into HTML using JSP tags.
2. **Powerful**: JSP benefits from the strong performance, versatility, and platform independence of Java.
3. **Scalability**: Being part of the Java ecosystem, JSPs scale well for large applications, supported by Java's robust architecture and threading capabilities.

4. **Reusability**: JSP allows the reuse of components and tag libraries, which can simplify the development process and reduce the amount of code that needs to be written.
5. **Integration**: JSP seamlessly integrates with other Java APIs and technologies for database access, transaction management, and more.

Disadvantages:
1. **Performance Overhead**: Because JSP pages need to be compiled into servlets, they might not perform as well as precompiled servlets, especially on the first request.
2. **Complexity in Large Applications**: Managing a large JSP-based application can become complex due to the difficulty in separating business logic from presentation layers effectively when not using MVC or similar frameworks.
3. **Less Popular for Modern Applications**: With the rise of various modern web technologies such as Node.js, Python frameworks, and client-side frameworks like Angular and React, JSP has seen a decline in popularity.
4. **Debugging Difficulty**: Debugging JSPs can be more challenging than static HTML or other scripting languages because errors may stem from the Java code embedded in the HTML.

Code:

```java
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.*;
import javax.servlet.ServletException;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
```

```java
public class StudentServlet extends HttpServlet {
    private String jdbcURL = "jdbc:mysql://localhost:3306/testdb";
    private String jdbcUsername = "root";
    private String jdbcPassword = "password";

    public void doGet(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection connection = DriverManager.getConnection(jdbcURL,
jdbcUsername, jdbcPassword);
            Statement statement = connection.createStatement();
            ResultSet rs = statement.executeQuery("SELECT * FROM
students");

            out.println("<html><head><title>Student Mark
List</title></head><body>");
            out.println("<h1>Student Mark List</h1>");
            out.println("<table
border='1'><tr><th>ID</th><th>Name</th><th>Marks</th></tr>");

            while (rs.next()) {
                int id = rs.getInt("id");
                String name = rs.getString("name");
                int mark = rs.getInt("mark");

                out.println("<tr><td>" + id + "</td><td>" + name +
"</td><td>" + mark + "</td></tr>");
            }
            out.println("</table></body></html>");
        } catch (Exception e) {
            e.printStackTrace();
            out.println("Error: " + e.getMessage());
        } finally {
            out.close();
        }
```
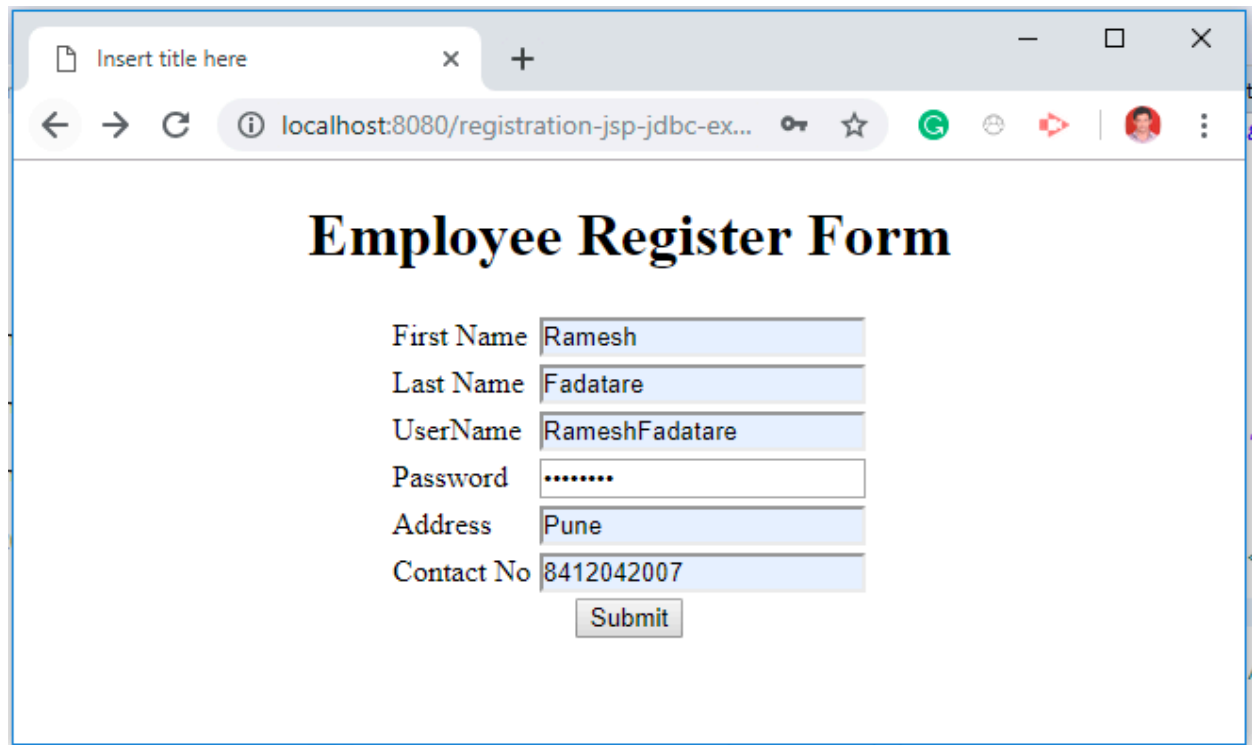
```
    }
}
```

Output:

Conclusion:

This Java Servlet demonstrates a streamlined approach to developing a web application by directly integrating database interactions and web presentation. It effectively retrieves and displays student mark data from a MySQL database in a simple HTML format, suitable for educational or small-scale applications.