Experiment - 06.

- **Aim:** Implement the program demonstrating the use of JSP.
  eg: Create a database table students-info (stud-id, stud-name, class, division, city) using database like oracle / mysql, etc. and display (use SQL select query) the table content using JSP.

- **Theory:** Introduction to JSP.

1) • JavaServer Pages (JSP) is a server-side technology that creates dynamic web applications.
• It allows developers to embed java code directly into HTML or XML pages and it makes web development more efficient.

• JSP is an advanced version of servelets. It provides enhanced capabilities for building scalable and platform independent web pages.

2) * How is JSP more advantageous than Servelets?

• JSP simplifies web development by combining the strengths of java with the flexibility of HTML.

* Some of the advantages of JSP over servelets are listed below -

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1. JSP code is easier to manage than servelets as it separates UI and business logic.
2. JSP minimizes the amount of code required for web applications.
3. Easily generates content dynamically in response to user interactions.
4. It provides access to the complete range of Java APIs for robust application development.
5. JSP is suitable for applications with growing user bases.

3] Key features of JSP -

- Platform Independence - Write once, run anywhere.
- It simplifies database interactions for dynamic content.
- It contains predefined objects like request, response, session and application reduce development time.
- It has built-in mechanisms for exception and error management.
- It supports custom tags and tag libraries.

4] JSP Architecture -

JSP follows a three layer architecture :

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1. Client layer – The browser sends a request to the server.

2. Web server layer – The server processes the request using a JSP engine.

3. Database / Backend layer – Interacts with the database and returns the response to the client.

5] Steps to create a JSP application –

1. Take any HTML file you have previously created.
2. Change the file extension from .html to .jsp.
3. Load the new .jsp file in browser.

When we load a JSP file for the first time.

- The JSP is converted into a java file.
- The Java file is compiled into a servelet.
- The compiled servelet is loaded and executed.

6] Adding dynamic content with JSP –

Example –

```
<html>
    <body>
        Hello! The time is now <%= new
        java.util.Date() %>
    </body>
</html>
```

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- Explanation -
- The <%= %> tags enclose a java expression.
- The new java.util.Date() expression retrieves the current date and time.
- When the JSP page is loaded in the browser, the java expression is evaluated at runtime, and the output is embedded into the HTML.
- Each time you reload the page, it displays the current time, demonstrating how JSP dynamically generates HTML content based on JAVA logic.

7] JSP Elements -

(a). Expression - This tag is used to output any data on the generated page. These data are automatically converted to a string and printed on output stream.

Syntax - <%= "Anything" %>

(b). Scriplets -
This allows inserting any amount of valid java code. These codes are placed in the _jspService() method by the JSP engine.

Syntax → <% // Java codes %>
Eg → <%
String name = "Hello";
out.println ("Variable " + name);
%>

Variables available to the JSP Scriptlets are -

- Request
- Response
- Session
- Out

(c) Directives - A jsp directive starts with <%@. In it we can import packages, define error-handling pages or configure session information for JSP page.

Syntax → <%@ directive attribute = "value" %>

Types of directives -

1. pages = It defines page settings.
2. include = It includes other files.
3. taglib = It declares a custom tag library.

(d). Declarations : This is used for defining functions and variables to be used in the JSP.
Variables and functions defined in the declaratives are class level and can be used anywhere on the JSP page.

Eg -
```
<%@ page import = "java.util.*" %>
<html>
    <body>
        <%!  Date theDate = new Date();
             Date getDate (){
                 System.out.println ("getDate()");
                 return theDate;
             }
        %>
```

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```
Hello! The time is now <%= getDate() %>
</body>
</html>
```

8] Running a simple JSP page -

Steps to run JSP -

1. Save the JSP file using the .jsp extension (eg. hello.jsp
2. Start the server.
3. Place your application inside appropriate folder (eg. webapps for tomcat)
4. Open the browser and enter the JSP page URL.

http://localhost:port/Yourapplication/jspfile.

The JSP is compiled and executed.

9] Why use JSP?

- Embed java logic directly to HTML.
- To create dynamic pages that respond to user actions.
- TO customize content for each user or session.

* **Conclusion:** Thus we successfully used database with java server pages or JSP.

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