Java Full Stack Lab Manual - JDBC Experiment

Aim

To write a basic Java Servlet program and understand the structure and role of the deployment descriptor (web.xml) in servlet deployment.

Technologies Used

Java, Servlet API, Apache Tomcat, HTML, Eclipse/IntelliJ (optional)

Directory Structure

```
MyServletApp/
|
+- WEB-INF/
|  +- web.xml
|  +- classes/
|     +- HelloServlet.class
+- index.html
```

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Java Servlet Program - HelloServlet.java

```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class HelloServlet extends HttpServlet {
    public void doGet(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        out.println("<html><body>");
        out.println("<h2>Hello, this is a servlet response!</h2>");
        out.println("</body></html>");
    }
}
```

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Deployment Descriptor - web.xml

```
<web-app xmlns="http://xmlns.jcp.org/xml/ns/javaee"
         xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
         xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
         http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd"
         version="3.1">

    <servlet>
        <servlet-name>HelloServlet</servlet-name>
        <servlet-class>HelloServlet</servlet-class>
    </servlet>

    <servlet-mapping>
        <servlet-name>HelloServlet</servlet-name>
        <url-pattern>/hello</url-pattern>
    </servlet-mapping>
</web-app>
```

How to Run the Servlet

1. Compile the servlet using the Servlet API JAR from Tomcat:

   javac -classpath /path/to/tomcat/lib/servlet-api.jar HelloServlet.java

2. Place the compiled class in WEB-INF/classes/.
3. Place the web.xml inside WEB-INF/.
4. Deploy the project folder (MyServletApp) into the webapps directory of Tomcat.
5. Start Tomcat and open: http://localhost:8080/MyServletApp/hello

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Expected Output

```
Hello, this is a servlet response!
```

web.xml Overview

- Declares and maps servlet classes.
- Handles initialization parameters.
- Controls session timeouts, welcome files, and error handling.
- Required for servlet configuration in traditional deployments (prior to annotations).

Result

Successfully created a basic Java Servlet application and studied the use of the deployment descriptor (web.xml) for servlet mapping and configuration.