Lab 6

Servlets and JSP

1. Write a servlet program illustrating the concept of GenericServlet class with proper illustration of the Deployment Descriptor.

Question1.java

```
import java.io.*;
import javax.servlet.*;
public class Question1 extends GenericServlet {
   private static final long serialVersionUID = 1L;

   @Override
   public void service(ServletRequest req, ServletResponse res) throws ServletException,
IOException {
      res.setContentType("text/html;charset-UTF-8");
      PrintWriter out = res.getWriter();
      out.print("
            <html>
            <head>
            <title>GenericServlet Example</title>
            </head>
            <body>
            illustrating the concept of GenericServlet class with
            proper illustration of the Deployment Descriptor.
            </body>
            </html>
            ");
   }

}
```

2. Write a servlet program illustrating the concept of HttpServlet class with proper illustration of the Deployment Descriptor.

Question2.java

```
import java.io.*;

import javax.servlet.*;

import javax.servlet.http.*;

public class Question2 extends HttpServlet {

   private static final long serialVersionUID = 1L;
```

```
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet question2</title>");
            out.println("</head>");
            out.println("<body>");
            out.println("illustrating the concept of HTTPServlet class with proper illustration of the
Deployment Descriptor.");
            out.println("</body>");
            out.println("</html>");
        }
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        processRequest(request, response);
    }
}
```

3. Write a sevlet program to illustrate form handling. Design a html page consisting of fields like Name, Address, Email, Gender (Radio Button), Maximum Qualification (Drop Down consisting values like Select a Qualification Level, SLC, +2, Bachelor, Masters, etc) and a submit button. The servlet must display the data entered by user.

Question3.java

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

```
@WebServlet(urlPatterns = {"/question3"})
public class Question3 extends HttpServlet {
   private static final long serialVersionUID = 1L;
   protected void processRequest(HttpServletRequest request, HttpServletResponse
response)
         throws ServletException, IOException {
      response.setContentType("text/html;charset=UTF-8");
      try (PrintWriter out = response.getWriter()) {
         String name = request.getParameter("name");
         String address = request.getParameter("address");
         String email = request.getParameter("email");
         String gender = request.getParameter("gender");
         String qualification = request.getParameter("qualification");

         out.println("<!DOCTYPE html>");
         out.println("<html>");
         out.println("<head>");
         out.println("<title>Servlet Question3</title>");
         out.println("</head>");
         out.println("<body>");
         out.println("<h2>Form Data Submitted</h2>");
         out.println("<p>Name: " + name + "</p>");
         out.println("<p>Address: " + address + "</p>");
         out.println("<p>Email: " + email + "</p>");
         out.println("<p>Gender: " + gender + "</p>");
         out.println("<p>Qualification: " + qualification + "</p>");

         try {
            Class.forName("com.mysql.jdbc.Driver"); // Updated driver class
            try (Connection conn =
DriverManager.getConnection("jdbc:mysql://localhost/user_info", "root", "")) {

               String createTableQuery = "CREATE TABLE IF NOT EXISTS user_details
("
                     + "id INT AUTO_INCREMENT PRIMARY KEY, "
                     + "name VARCHAR(250), "
                     + "address VARCHAR(250), "
                     + "email VARCHAR(250), "
                     + "gender VARCHAR(10), "
                     + "qualification VARCHAR(250))";
               try (PreparedStatement pst = conn.prepareStatement(createTableQuery)) {
                  pst.executeUpdate();
               }
```

```
                // Insert data into the table
                String insertQuery = "INSERT INTO user_details (name, address, email,
gender, qualification) "
                        + "VALUES (?, ?, ?, ?, ?)";
                try (PreparedStatement pst1 = conn.prepareStatement(insertQuery)) {
                   pst1.setString(1, name);
                   pst1.setString(2, address);
                   pst1.setString(3, email);
                   pst1.setString(4, gender);
                   pst1.setString(5, qualification);
                   pst1.executeUpdate();
                }
                String selectQuery = "SELECT * FROM user_details";
                try (PreparedStatement pst2 = conn.prepareStatement(selectQuery);
                    ResultSet rs = pst2.executeQuery()) {
                   out.println("<h2>Data from Database</h2>");
                   out.println("<table border='1'>");

out.println("<tr><th>ID</th><th>Name</th><th>Address</th><th>Email</th><th>Gen
der</th><th>Qualification</th></tr>");
                   while (rs.next()) {
                      out.println("<tr>");
                      out.println("<td>" + rs.getInt("id") + "</td>");
                      out.println("<td>" + rs.getString("name") + "</td>");
                      out.println("<td>" + rs.getString("address") + "</td>");
                      out.println("<td>" + rs.getString("email") + "</td>");
                      out.println("<td>" + rs.getString("gender") + "</td>");
                      out.println("<td>" + rs.getString("qualification") + "</td>");
                      out.println("</tr>");
                   }
                   out.println("</table>");
                }
             }
          } catch (Exception e) {
             e.printStackTrace();
          }

          out.println("</body>");
          out.println("</html>");
       }
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
```

```
            throws ServletException, IOException {
        processRequest(request, response);
    }
}
```

4. Write a servlet program to illustrate the concept of:

a. Cookie

cookieExample.java

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

@WebServlet("/cookieExample")
public class cookieExample extends HttpServlet {
   private static final long serialVersionUID = 1L;
   protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
      response.setContentType("text/html;charset=UTF-8");
      try (PrintWriter out = response.getWriter()) {
         out.println("<!DOCTYPE html>");
         out.println("<html>");
         out.println("<head>");
         out.println("<title>Cookie Handling</title>");
         out.println("</head>");
         out.println("<body>");
         String cookieValue = request.getParameter("cname");
         if (cookieValue != null && !cookieValue.isEmpty()) {
            Cookie cookie = new Cookie("mycookie", cookieValue);
            response.addCookie(cookie);
            out.println("Cookie set successfully!<br>");
         } else {
```

```
            out.println("No cookie value provided.<br>");
        }
        Cookie[] cookies = request.getCookies();
        if (cookies != null) {
            out.println("<h3>Cookies:</h3>");
            for (Cookie c : cookies) {
                out.println("Cookie Name: " + c.getName() + " | Value: " + c.getValue() + "<br>");
            }
        } else {
            out.println("No cookies found.<br>");
        }
        out.println("</body>");
        out.println("</html>");
    }
  }
  @Override
  protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    processRequest(request, response);
  }
}
```

b. Session and Session Tracking

sessionExample.java

```
        import java.io.*;
        import java.sql.*;
        import javax.servlet.annotation.*;
        import javax.servlet.http.*;
@WebServlet("/sessionExample")
```

```
public class sessionExample extends HttpServlet {
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Session Handling</title>");
            out.println("</head>");
            out.println("<body>");
            String sessionName = request.getParameter("name");
            if (sessionName != null && !sessionName.isEmpty()) {
                HttpSession session = request.getSession();
                session.setAttribute("username", sessionName);
                out.println("Session set successfully!<br>");
                out.println("Stored session value is: " + session.getAttribute("username") + "<br>");
            } else {
                out.println("No session name provided.<br>");
            }
            out.println("<a href=\"index.html\">Back to Home</a>");
            out.println("</body>");
            out.println("</html>");
        }
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
```

```
        processRequest(request, response);
    }
}
```

5.Illustrate the concept of login using:

a. Servlet

servExample.java

```
import java.io.*;
import java.sql.*;
import javax.servlet.annotation.*;
import javax.servlet.http.*;
public class servExample extends HttpServlet {
    private static final String DEFINED_USERNAME = "cody";
    private static final String DEFINED_PASSWORD = "cody";
    private static final long serialVersionUID = 1L;
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet question10a</title>");
            out.println("</head>");
            out.println("<body>");
            String username = request.getParameter("username");
            String password = request.getParameter("password");
            if (username != null && !username.isEmpty() && password != null &&
!password.isEmpty()) {
```

```
            if (username.equals(DEFINED_USERNAME) &&
password.equals(DEFINED_PASSWORD)) {
                out.println("Login successful!!");
            } else {
                out.println("Invalid Credentials!!");
            }
        } else {
            out.println("Please enter both username and password.");
        }
        out.println("</body>");
        out.println("</html>");
    }
  }
  @Override
  protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    processRequest(request, response);
  }
}
```

b. JSP

11.Write a simple JSP program to illustrate:

a. Passing data from Servlet to JSP

QuestionA.java

```
import java.io.*;
import java.sql.*;
import javax.servlet.annotation.*;
import javax.servlet.http.*;
public class QuestionA extends HttpServlet {
```

```
    private static final long serialVersionUID = 1L;
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
            PrintWriter out = response.getWriter();
            String message = "Hello from Servlet!";
            request.setAttribute("message", message);
            request.getRequestDispatcher("QuestionA.jsp").forward(request, response);
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        processRequest(request, response);
    }
}
```

b. Passing object from servlet to JSP

QuestionB.java

```
import java.io.*;
import java.sql.*;
import javax.servlet.annotation.*;
import javax.servlet.http.*;
public class QuestionB extends HttpServlet {
    private static final long serialVersionUID = 1L;
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        question11 q = new question11();
        q.setName("cody");
```

```
        q.setAddress("kathmandu");
        request.setAttribute("data", q);
        request.getRequestDispatcher("QuestionB.jsp").forward(request, response);
        }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        processRequest(request, response);
    }
}
```

c. Passing list from servlet to JSP

QuestionC.java

```
import java.io.*;
import java.sql.*;
import javax.servlet.annotation.*;
import javax.servlet.http.*;
public class QuestionC extends HttpServlet {
    private static final long serialVersionUID = 1L;
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        List<question11> person = new ArrayList<>();
        question11 q = new question11();
        q.setName("cody");
        q.setAddress("kathmandu");
        question11 q1 = new question11();
        q1.setName("Sahil");
        q1.setAddress("kathmandu");
```

```
        question11 q3 = new question11();
        q3.setName("Milan");
        q3.setAddress("kathmandu");
        person.add(q);
        person.add(q1);
        person.add(q3);
        request.setAttribute("data", person);
        request.getRequestDispatcher("question11c.jsp").forward(request, response);
    }
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        processRequest(request, response);
    }
}
```

Discussion and Conclusion:

In this lab, we learn and discussed about the concept of servlet and JSP. In lab, we discussed about the GenericServlet and HttpServlet class and do simple servlet task and try to connect that with database and learn to handle session and cookies in the application. At the end we learn to pass data, object and list from servlet to jsp.