Database : parul
Table :

```
CREATE TABLE `user` (
  `firstname` varchar(20) NOT NULL,
  `username` varchar(20) NOT NULL,
  `password` varchar(20) NOT NULL,
  `city` varchar(20) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
```

For installing/ importing SQL Connector Library :

Project Files -> pom.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mycompany</groupId>
    <artifactId>DivE</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>jar</packaging>
    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>17</maven.compiler.source>
        <maven.compiler.target>17</maven.compiler.target>
        <exec.mainClass>com.mycompany.dive.DivE</exec.mainClass>
    </properties>
    <dependencies>
        <!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>8.0.33</version>
        </dependency>
    </dependencies>
</project>
```

For Inserting DATA using Statement :

```java
import java.sql.*;
/**
 *
 * @author hardikparmar
 */

public class DIVF {

    public static void main(String[] args) {
        Try{

            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/parul","root","");
            Statement st = con.createStatement();

            int count= st.executeUpdate("INSERT INTO `user`(`firstname`, `username`, `password`,
`city`) VALUES ('ABC','ABC','1234','Vadodara')");

            if(count>0){
                System.out.println("Data Inserted ");
            }
            else{
                System.out.println("Data NOT Inserted ");
            }

            con.close();
        }
        catch (Exception e){
            e.printStackTrace();
        }


    }
}
```

For Inserting DATA using PreparedStatement :

```java
import java.sql.*;

/**
 *
 * @author hardikparmar
 */
public class PSStatement {
    public static void main(String[] args) {
        try{
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/parul","root","");
            PreparedStatement ps = con.prepareStatement("INSERT INTO `user`(`firstname`,
`username`, `password`, `city`) VALUES (?,?,?,?)");
            ps.setString(1, "XYZ");
            ps.setString(2, "XYZ");
            ps.setString(3, "1234");
            ps.setString(4, "Vadodara");
        int count= ps.executeUpdate();

            if(count>0){
                System.out.println("Data Inserted ");
            }
            else{
                System.out.println("Data NOT Inserted ");
            }
            con.close();

        }
        catch (Exception e){
            e.printStackTrace();
        }

    }

}
```

Retrieving the Data :

```java
import java.sql.*;
/**
 *
 * @author hardikparmar
 */
public class GETDATA {

    public static void main(String[] args) {
      try{
         Class.forName("com.mysql.cj.jdbc.Driver");
         Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/parul","root","");
         Statement st = con.createStatement();
         ResultSet rs= st.executeQuery("SELECT * FROM `user`");
       while(rs.next()){
          System.out.println("Firstname : "+rs.getString(1)+" Username  :"+rs.getString(2)+" City
:"+rs.getString(4));
       }


      }
      catch (Exception e){
         e.printStackTrace();
      }

   }
}
```

Practical 1 :
Develop a java application using concept of JDBC for user login. User will enter username and password. Application will match for the same in database table. If match is found then display message "Successful Login" and if not found then display message "Invalid Username and password .

```java
import java.sql.*;
import java.util.Scanner;
/**
 *
 *
 *
 * @author hardikparmar
 */
public class GetData {
    public static void main(String[] args) {
      try{
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter Username :");
        String username = sc.nextLine();
        System.out.println("Enter Password :");
        String password = sc.nextLine();
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/parul","root","");
         Statement st = con.createStatement();
         ResultSet rs=  st.executeQuery("SELECT * FROM `user` where
username='"+username+"' and password='"+password+"'");

      if(rs.next()){
          System.out.println("Login  Successful");
      }
      else{
       System.out.println("Invalid Username and password");
      }

       con.close();
    }
     catch (Exception e){
       e.printStackTrace();
     }
   }
}
```

Practical 2 :

Develop a Menu driven java application for student information which will create the table with appropriate columns. Menu will contain the options like insert, update and delete. Based on the option, data will be inserted or updated or deleted from table based on student id (student_id will be primary key). Display appropriate message for each operation.

Table :

```
CREATE TABLE `student` (
  `student_id` int(20) NOT NULL,
  `name` varchar(100) NOT NULL,
  `age` int(11) NOT NULL,
  `grade` varchar(100) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

ALTER TABLE `student`
  ADD PRIMARY KEY (`student_id`);

ALTER TABLE `student`
  MODIFY `student_id` int(20) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=3;
```

JAVA CODE (class name : StudentInformation)

```java
import java.sql.*;
import java.util.Scanner;

/**
 *
 * @author hardikparmar
 */
public class StudentInformation {

    public static void main(String[] args) {
        Connection con = null;
        PreparedStatement ps = null;
        Scanner sc = new Scanner(System.in);
        try {

            Class.forName("com.mysql.cj.jdbc.Driver");
```

```java
con = DriverManager.getConnection("jdbc:mysql://localhost:3306/parul", "root", "");
String sid;
String sname;
String sage;
String grade;

System.out.println("Menu:");
System.out.println("1. Insert Student");
System.out.println("2. Update Student");
System.out.println("3. Delete Student");
System.out.println("4. Show Students");
System.out.println("5. Exit");

int choice;
do {

    System.out.print("Enter your choice (1-5): ");
    String userChoice = sc.nextLine();
    choice = Integer.parseInt(userChoice);

    switch (choice) {
        case 1:
            System.out.print("Enter Student Name : ");
            sname = sc.nextLine();
            System.out.print("Enter Student age : ");
            sage = sc.nextLine();
            System.out.print("Enter Student grade : ");
            grade = sc.nextLine();
            ps = con.prepareStatement(" INSERT INTO `student`( `name`, `age`, `grade`)
VALUES (?,?,?)");
            ps.setString(1, sname);
            ps.setString(2, sage);
            ps.setString(3, grade);
            int count = ps.executeUpdate();
            if (count > 0) {
                System.out.println("Data Inserted ");
            } else {
                System.out.println("Data NOT Inserted ");
            }

            break;
        case 2:
            System.out.print("Enter Student ID : ");
            sid = sc.nextLine();
```

```java
                System.out.print("Enter Student Name : ");
                sname = sc.nextLine();
                System.out.print("Enter Student age : ");
                sage = sc.nextLine();
                System.out.print("Enter Student grade : ");
                grade = sc.nextLine();
                ps = con.prepareStatement("UPDATE `student` SET
`name`=?,`age`=?,`grade`=? WHERE `student_id`=?");
                ps.setString(1, sname);
                ps.setString(2, sage);
                ps.setString(3, grade);
                ps.setString(4, sid);
                count = ps.executeUpdate();
                if (count > 0) {
                    System.out.println("Data Updated ");
                } else {
                    System.out.println("Data NOT Updated, Please Enter Correct Student ID");
                }

                break;
            case 3:
                System.out.print("Enter Student ID : ");
                sid = sc.nextLine();
                ps = con.prepareStatement("DELETE FROM `student` WHERE `student_id`=?");
                ps.setString(1, sid);
                count = ps.executeUpdate();
                if (count > 0) {
                    System.out.println("Data Deleted ");
                } else {
                    System.out.println("Data NOT Deleted, Please Enter Correct Student ID");
                }
                break;
            case 4:
                ps = con.prepareStatement("SELECT * FROM `student`");
                ResultSet rs = ps.executeQuery();
                if (rs.next()) {
                    System.out.println("Student ID : " +rs.getString(1) + " Student Name : "
+rs.getString(2)+ " Student age : " +rs.getString(3) +  " Student Grade : " +rs.getString(4));
                } else {
                    System.out.println("NO Records Found");
                }
                break;
            case 5:
                System.out.println("byeee!");
```

```
                break;
            default:
                System.out.println("Invalid choice. Please enter a number between 1 and 4.");
                break;
        }

    } while (choice != 5);

} catch (Exception e) {
    e.printStackTrace();
}

  }

}
```

Practical 3 :
Develop an application using GUI for user registration. In first form user will enter the data for registration (e.g. Name, Birthdate, Email_id, Phone_No). When user clicks on submit button, data will be inserted into database and user will be redirected to another form. In this form data will be selected from database and displayed in proper format.

Table :

```
CREATE TABLE `users` (
 `uid` int(10) NOT NULL,
 `name` varchar(100) NOT NULL,
 `birthdate` varchar(100) NOT NULL,
 `email` varchar(100) NOT NULL,
 `phone` varchar(100) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;


ALTER TABLE `users`
 ADD PRIMARY KEY (`uid`);

ALTER TABLE `users`
 MODIFY `uid` int(10) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=3;
```

JAVA CODE (class name : Registration**)**

```java
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.*;

/**
 *
 * @author hardikparmar
 */
public class Registration {

    static JFrame registrationFrame;
    static JFrame displayFrame;
    static JTextField nameField, birthdateField, emailField, phoneField;
    static JButton submitButton;

    public static void main(String[] args) {

        SwingUtilities.invokeLater(() -> {
            try {
                registrationFrame = new JFrame("User Registration");
                registrationFrame.setSize(400, 300);
                registrationFrame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

                JPanel panel = new JPanel();
                panel.setLayout(new GridLayout(5, 2));

                panel.add(new JLabel("Name:"));
                nameField = new JTextField();
                panel.add(nameField);

                panel.add(new JLabel("Birthdate:"));
                birthdateField = new JTextField();
                panel.add(birthdateField);

                panel.add(new JLabel("Email ID:"));
                emailField = new JTextField();
                panel.add(emailField);

                panel.add(new JLabel("Phone Number:"));
                phoneField = new JTextField();
                panel.add(phoneField);
```

```java
        submitButton = new JButton("Submit");
        submitButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent ae) {
                try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
                    Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/parul", "root", "");
                    PreparedStatement ps = con.prepareStatement("INSERT INTO users (name,
birthdate, email, phone) VALUES (?, ?, ?, ?)");
                    ps.setString(1, nameField.getText());
                    ps.setString(2, birthdateField.getText());
                    ps.setString(3, emailField.getText());
                    ps.setString(4, phoneField.getText());

                    int count = ps.executeUpdate();
                    registrationFrame.setVisible(false);
                    displayFrame = new JFrame("User Data Display");
                    displayFrame.setSize(400, 300);
                    displayFrame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

                    JTextArea displayArea = new JTextArea();
                    displayArea.setEditable(false);
                    if (count > 0) {

                        ps = con.prepareStatement("SELECT * FROM users");
                        ResultSet rs = ps.executeQuery();

                        while (rs.next()) {
                            displayArea.append("User ID: " + rs.getString(1) + "\n");
                            displayArea.append("Name: " + rs.getString(2) + "\n");
                            displayArea.append("Birthdate: " + rs.getString(3) + "\n");
                            displayArea.append("Email: " + rs.getString(4) + "\n");
                            displayArea.append("Phone: " + rs.getString(5) + "\n\n");
                        }

                        displayFrame.getContentPane().add(new JScrollPane(displayArea));
                        displayFrame.setVisible(true);

                    } else {
                        displayArea.append(" NO DATA \n");
                    }
```

```java
                    } catch (Exception e) {
                        e.printStackTrace();
                    }


                }
            });
            panel.add(submitButton);
            registrationFrame.getContentPane().add(BorderLayout.CENTER, panel);
            registrationFrame.setVisible(true);
        } catch (Exception e) {
            e.printStackTrace();
        }
    });
  }

}
```

Servlets:

Pom.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.mycompany</groupId>
  <artifactId>DivEServlet</artifactId>
  <version>1.0-SNAPSHOT</version>
  <packaging>war</packaging>

  <name>DivEServlet</name>

  <properties>
    <endorsed.dir>${project.build.directory}/endorsed</endorsed.dir>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>

  <dependencies>
    <dependency>
```

```xml
            <groupId>javax</groupId>
            <artifactId>javaee-web-api</artifactId>
            <version>7.0</version>
            <scope>provided</scope>
        </dependency>
        <!-- https://mvnrepository.com/artifact/jakarta.servlet/jakarta.servlet-api -->
        <dependency>
            <groupId>jakarta.servlet</groupId>
            <artifactId>jakarta.servlet-api</artifactId>
            <version>6.1.0-M1</version>
            <scope>provided</scope>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-compiler-plugin</artifactId>
                <version>3.1</version>
                <configuration>
                    <source>1.7</source>
                    <target>1.7</target>
                    <compilerArguments>
                        <endorseddirs>${endorsed.dir}</endorseddirs>
                    </compilerArguments>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-war-plugin</artifactId>
                <version>3.4.0</version>
                <configuration>
                    <failOnMissingWebXml>false</failOnMissingWebXml>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-dependency-plugin</artifactId>
                <version>2.6</version>
                <executions>
                    <execution>
                        <phase>validate</phase>
                        <goals>
```

```xml
                    <goal>copy</goal>
                </goals>
                <configuration>
                    <outputDirectory>${endorsed.dir}</outputDirectory>
                    <silent>true</silent>
                    <artifactItems>
                        <artifactItem>
                            <groupId>javax</groupId>
                            <artifactId>javaee-endorsed-api</artifactId>
                            <version>7.0</version>
                            <type>jar</type>
                        </artifactItem>
                    </artifactItems>
                </configuration>
            </execution>
        </executions>
    </plugin>
</plugins>
</build>

</project>
```

MyServlet.java

```java
package  com.mycompany.diveservlet;

import jakarta.servlet.*;
import jakarta.servlet.http.*;
import  java.io.IOException;
import java.io.PrintWriter;
import jdk.internal.org.jline.reader.PrintAboveWriter;

/**
 *
 * @author hardikparmar
 */
public class MyServlet extends HttpServlet {

    @Override
    protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
        PrintWriter out = resp.getWriter();
        out.println("<h1> Hello Service method </h1>");
```

```
    }

}
```

Web.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>

<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">
  <session-config>
     <session-timeout>
        30
     </session-timeout>
  </session-config>

  <servlet>
     <servlet-name>MyServlet</servlet-name>
     <servlet-class>com.mycompany.diveservlet.MyServlet</servlet-class>
  </servlet>
  <servlet-mapping>
     <servlet-name>MyServlet</servlet-name>
     <url-pattern>/MyServlet</url-pattern>
  </servlet-mapping>
</web-app>
```

Practical 4 :Develop a data driven servlet application for user authentication.

Pom.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
```

```xml
<modelVersion>4.0.0</modelVersion>

<groupId>com.mycompany</groupId>
<artifactId>DivFServlets</artifactId>
<version>1.0-SNAPSHOT</version>
<packaging>war</packaging>

<name>DivFServlets</name>

<properties>
    <endorsed.dir>${project.build.directory}/endorsed</endorsed.dir>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
</properties>

<dependencies>
    <dependency>
        <groupId>javax</groupId>
        <artifactId>javaee-web-api</artifactId>
        <version>7.0</version>
        <scope>provided</scope>
    </dependency>
    <!-- https://mvnrepository.com/artifact/jakarta.servlet/jakarta.servlet-api -->
    <dependency>
        <groupId>jakarta.servlet</groupId>
        <artifactId>jakarta.servlet-api</artifactId>
        <version>6.1.0-M1</version>
        <scope>provided</scope>
    </dependency>
    <!-- https://mvnrepository.com/artifact/com.mysql/mysql-connector-j -->
    <dependency>
        <groupId>com.mysql</groupId>
        <artifactId>mysql-connector-j</artifactId>
        <version>8.3.0</version>
    </dependency>

</dependencies>

<build>
    <plugins>
        <plugin>
            <groupId>org.apache.maven.plugins</groupId>
            <artifactId>maven-compiler-plugin</artifactId>
            <version>3.1</version>
            <configuration>
```

```xml
                    <source>1.7</source>
                    <target>1.7</target>
                    <compilerArguments>
                        <endorseddirs>${endorsed.dir}</endorseddirs>
                    </compilerArguments>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-war-plugin</artifactId>
                <version>3.4.0</version>
                <configuration>
                    <failOnMissingWebXml>false</failOnMissingWebXml>
                </configuration>
            </plugin>
            <plugin>
                <groupId>org.apache.maven.plugins</groupId>
                <artifactId>maven-dependency-plugin</artifactId>
                <version>2.6</version>
                <executions>
                    <execution>
                        <phase>validate</phase>
                        <goals>
                            <goal>copy</goal>
                        </goals>
                        <configuration>
                            <outputDirectory>${endorsed.dir}</outputDirectory>
                            <silent>true</silent>
                            <artifactItems>
                                <artifactItem>
                                    <groupId>javax</groupId>
                                    <artifactId>javaee-endorsed-api</artifactId>
                                    <version>7.0</version>
                                    <type>jar</type>
                                </artifactItem>
                            </artifactItems>
                        </configuration>
                    </execution>
                </executions>
            </plugin>
        </plugins>
    </build>

</project>
```

Index.html

```html
<!DOCTYPE html>
<html>
   <head>
      <title>Start Page</title>
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
   </head>
   <body>
      <h1>Hello Servlet!</h1>

      <form action="MyServlet" method="GET">
       User name :  <input type="text" name="username"> <br><!-- comment -->
       Password :  <input type="text" name="password"> <br><!-- comment -->
       <input type="submit" name="submit">
      </form>
   </body>
</html>
```

MyServlet.java

```java
import jakarta.servlet.*;
import jakarta.servlet.http.*;
import java.io.*;
import java.sql.*;

/**
 *
 * @author hardikparmar
 */
public class MyServlet extends HttpServlet {

   @Override
   protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
      PrintWriter out = resp.getWriter();
      out.println("<h1> Hello from Service method </h1>");
      String uname = req.getParameter("username");
      String pass = req.getParameter("password");
      out.println(uname);
      out.println(pass);
```

```java
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/parul",
"root", "");
            Statement st = con.createStatement();
            ResultSet rs = st.executeQuery("SELECT * FROM `user` where username='" + uname +
"' and password='" + pass + "'");
            if (rs.next()) {
                out.println("Login Successful");
            } else {
                out.println("Invalid Username and password");
            }

            con.close();

        } catch (Exception e) {
            out.println("There was some problem");
        }
    }
}
```

Web.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<web-app version="3.1" 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">
    <session-config>
    <session-timeout>
        30
    </session-timeout>
    </session-config>
    <servlet>
        <servlet-name>MyServlet</servlet-name>
        <servlet-class>com.mycompany.divfservlets.MyServlet</servlet-class>
    </servlet>
    <servlet-mapping>
        <servlet-name>MyServlet</servlet-name>
        <url-pattern>/MyServlet</url-pattern>
    </servlet-mapping>
</web-app>
```

Practical 6 : Develop an application for the following:
User should be redirected to the URL entered in location text box.

Practical6.html

```html
<!DOCTYPE html>
<!--
Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this
license
Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Html.html to edit this template
-->
<html>
    <head>
        <title>TODO supply a title</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <form action="url">
            Enter URL : <input type="text" name="url"> </br>
            <input type="submit" name="submit" value="GO">

        </form>
    </body>
</html>
```

Practical6.java

```java
import jakarta.servlet.*;
import jakarta.servlet.http.*;
import java.io.IOException;
/**
 *
 * @author hardikparmar
 */
public class Practical6 extends HttpServlet {

    @Override
    protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
        String str = req.getParameter("url");
    resp.sendRedirect(str);
```

```
    }


}
```

Web.xml

```xml
<servlet>
    <servlet-name>practical6</servlet-name>
    <servlet-class>com.mycompany.divfservlets.Practical6</servlet-class>
  </servlet>

  <servlet-mapping>
      <servlet-name>practical6</servlet-name>
      <url-pattern>/url</url-pattern>
  </servlet-mapping>
```

Practical 5 :
Develop a servlet application for implementing student grading system. In this system on first page student will enter his data (name, id and department). By clicking on next button he will be redirected to another page. On the second page he will enter marks of all 6 subjects. By clicking on "Generate result" he will be redirected to next page. On this page all information of student will be displayed along with the result (pass or fail) in appropriate color. Also display the name of student on each page he visits. (Use session management)

firstPage.html

```html
<!DOCTYPE html>
<!--
Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this
license
Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Html.html to edit this template
-->
<html>
   <head>
     <title>TODO supply a title</title>
     <meta charset="UTF-8">
     <meta name="viewport" content="width=device-width, initial-scale=1.0">
   </head>
```

```html
    <body>
        <form action="Servlet1" method="GET">
            Enrollment number : <input type="text" name="enno"> </br>
            Name : <input type="text" name="name"> </br>
            Department : <input type="text" name="department"> </br>
            <input type="submit" value="next" name="submit"/>
        </form>
    </body>
</html>
```

subjectMarks.html

```html
<!DOCTYPE html>
<!--
Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this
license
Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Html.html to edit this template
-->
<html>
    <head>
        <title>TODO supply a title</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <form action="Servlet2" method="GET">
            Subject 1 : <input type="text" name="sub1"> </br>
            Subject 2 : <input type="text" name="sub2"> </br>
            Subject 3 : <input type="text" name="sub3"> </br>
            Subject 4 : <input type="text" name="sub4"> </br>
            Subject 5 : <input type="text" name="sub5"> </br>
            Subject 6 : <input type="text" name="sub6"> </br>
            <input type="submit" value="Generate Result" name="submit"/>
        </form>
    </body>
</html>
```

Servlet1.java

```java
import jakarta.servlet.*;
```

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

/**
 *
 * @author hardikparmar
 */
public class Servlet1 extends HttpServlet {

    @Override
    protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
        String enno = req.getParameter("enno");
        String name = req.getParameter("name");
        String department = req.getParameter("department");

        HttpSession session = req.getSession();
        session.setAttribute("enno", enno);
        session.setAttribute("name", name);
        session.setAttribute("department", department);
        RequestDispatcher rd = req.getRequestDispatcher("/subjectMarks.html");
        rd.include(req, resp);

    }

}
```

Servlet2.java

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

/**
 *
 * @author hardikparmar
 */
public class Servlet2 extends HttpServlet {

    @Override
    protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
```

```java
        double sub1 = Double.parseDouble(req.getParameter("sub1"));
        double sub2 = Double.parseDouble(req.getParameter("sub2"));
        double sub3 = Double.parseDouble(req.getParameter("sub3"));
        double sub4 = Double.parseDouble(req.getParameter("sub4"));
        double sub5 = Double.parseDouble(req.getParameter("sub5"));
        double sub6 = Double.parseDouble(req.getParameter("sub6"));

        HttpSession session = req.getSession();
        String enno = (String) session.getAttribute("enno");
        String name = (String) session.getAttribute("name");
        String department = (String) session.getAttribute("department");
        resp.setContentType("text/html");
        PrintWriter out = resp.getWriter();
        out.println("<h3> Enrollment number : " + enno + "</h3>");
        out.println("<h3> Name : " + name + "  </h3>");
        out.println("<h3> department : " + department + "  </h3>");

        out.println("<h2> sub1 : " + sub1 + " </h2>");
        out.println("<h2> sub2 : " + sub2 + " </h2>");
        out.println("<h2> sub3 : " + sub3 + " </h2>");
        out.println("<h2> sub4 : " + sub4 + "  </h2>");
        out.println("<h2> sub5 : " + sub5 + "  </h2>");
        out.println("<h2> sub6 : " + sub6 + "  </h2>");

        if (sub1 >= 30 && sub2 >= 30 && sub3 >= 30 && sub4 >= 30 && sub5 >= 30 && sub6 >=
30) {
            out.print("<h1> PASS </h1>");
        } else {
            out.print("<h1> FAIL </h1>");
        }

    }

}
```

Web.xml

```xml
 <servlet>
    <servlet-name>Servlet1</servlet-name>
    <servlet-class>com.mycompany.divfservlets.Servlet1</servlet-class>
  </servlet>
  <servlet-mapping>
```

```
    <servlet-name>Servlet1</servlet-name>
    <url-pattern>/Servlet1</url-pattern>
  </servlet-mapping>

 <servlet>
    <servlet-name>Servlet2</servlet-name>
    <servlet-class>com.mycompany.divfservlets.Servlet2</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>Servlet2</servlet-name>
    <url-pattern>/Servlet2</url-pattern>
  </servlet-mapping>
```

Filer Example :

Index.html

```html
<!DOCTYPE html>
<html>
  <head>
    <title>Start Page</title>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
  </head>
  <body>
    <h1>Hello World!</h1>
    <form action="MyServlet" method="GET">
     User name :  <input type="text" name="username"> <br>
     Password :  <input type="text" name="password"> <br>
       <input type="submit" name="login"> <br>
    </form>
  </body>
</html>
```

MyServlet.java

```java
import jakarta.servlet.*;
import jakarta.servlet.http.*;
import java.io.IOException;
import java.io.PrintWriter;
import jdk.internal.org.jline.reader.PrintAboveWriter;

/**
```

```java
 *
 * @author hardikparmar
 */
public class MyServlet extends HttpServlet {

    @Override
    protected void service(HttpServletRequest req, HttpServletResponse resp) throws
ServletException, IOException {
        PrintWriter out = resp.getWriter();
        out.println("<h1> Hello Service method </h1>");
        String un= req.getParameter("username");
        String pass= req.getParameter("password");

        out.println(un);
        out.println(pass);

    }

}
```

Filter1.java

```java
import jakarta.servlet.*;
import jakarta.servlet.http.*;
import java.io.*;
/**
 *
 * @author hardikparmar
 */
public class Filter1 implements Filter{

    @Override
    public void doFilter(ServletRequest sr, ServletResponse sr1, FilterChain fc) throws
IOException, ServletException {
        PrintWriter out = sr1.getWriter();
        // Pre Process
        out.println("<h1> Pre Process  </h1>");
        // Calling Our Servlet e.g MyServlet
        fc.doFilter(sr, sr1);
          // Post Process
        out.println("<h1> Post Process  </h1>");
```

```
      }


}
```

Web.xml

```xml
<servlet>
    <servlet-name>MyServlet</servlet-name>
    <servlet-class>com.mycompany.diveservlet.MyServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>MyServlet</servlet-name>
    <url-pattern>/MyServlet</url-pattern>
  </servlet-mapping>

  <filter>
    <filter-name>f1</filter-name>
    <filter-class>com.mycompany.diveservlet.Filter1</filter-class>
  </filter>
  <filter-mapping>
    <filter-name>f1</filter-name>
    <url-pattern>/MyServlet</url-pattern>
  </filter-mapping>
```

● **Data Insert Using JSP**

StudentInfo.jsp

```jsp
<%--
    Document   : StudentInfo
    Created on : 26-Mar-2024, 7:53:06 am
    Author     : hardikparmar
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
```

```html
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
      <title>Student Information</title>
   </head>
   <body>
      <h1>Student Information</h1>
      <form action="InsertData.jsp">
       name :  <input type="text" name="name"> <br />
       age :  <input type="text" name="age"> <br />
       grade :  <input type="text" name="grade"> <br />
         <input type="submit" name="submit" value="Save"> <br />
      </form>
   </body>
</html>
```

InsertData.jsp

```jsp
<%--
    Document   : InsertData
    Created on : 26-Mar-2024, 7:57:35 am
    Author     : hardikparmar
--%>

<%@page errorPage="Error.jsp"
import="java.sql.Connection,java.sql.PreparedStatement,java.sql.DriverManager"
contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
   <head>
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
      <title>JSP Page</title>
   </head>
   <body>
      <h1>Hello World!</h1>

      <%
         String sname = request.getParameter("name");
         String sage = request.getParameter("age");
         String sgrade = request.getParameter("grade");



         Class.forName("com.mysql.cj.jdbc.Driver");
```

```
        Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/parul",
"root", "");

        PreparedStatement ps = con.prepareStatement("INSERT INTO `student`(`name`, `age`,
`grade`) VALUES (?,?,?)");
        ps.setString(1, sname);
        ps.setString(2, sage);
        ps.setString(3, sgrade);

        int count = ps.executeUpdate();
        if (count > 0) {
            out.println("Data Inserted !!");
        } else {
          out.println("Data NOT Inserted !!");
        }
    %>

  </body>
</html>
```

Error.jsp

```
<%--
    Document   : Error
    Created on : 26-Mar-2024, 8:07:59 am
    Author     : hardikparmar
--%>

<%@page isErrorPage="true" contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>JSP Page</title>
  </head>
  <body>
    <h1>
      <%= exception%>

    </h1>
  </body>
```

</html>

Pom.xml

```
<dependencies>
<dependency>
       <groupId>mysql</groupId>
       <artifactId>mysql-connector-java</artifactId>
       <version>8.0.33</version>
     </dependency>
</dependencies>
```


Practical 7 : JSP - User Authentication
Develop a data driven JSP application for user authentication.

MySQL Table :

```
CREATE TABLE `user` (
 `firstname` varchar(20) NOT NULL,
 `username` varchar(20) NOT NULL,
 `password` varchar(20) NOT NULL,
 `city` varchar(20) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
```


StudentLogin.jsp

```
<%--
   Document   : StudentInfo
   Created on : 26-Mar-2024, 7:53:06 am
   Author     : hardikparmar
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
   <head>
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
      <title>Student Information</title>
```

```html
    </head>
    <body>
        <h1>Student Information</h1>
        <form action="checkLogin.jsp">
         username :  <input type="text" name="username"> <br />
         password :  <input type="text" name="password"> <br />
            <input type="submit" name="submit" value="Save"> <br />
        </form>
    </body>
</html>
```

checkLogin.jsp

```jsp
<%--
    Document   : InsertData
    Created on : 26-Mar-2024, 7:57:35 am
    Author     : hardikparmar
--%>

<%@page errorPage="Error.jsp"
import="java.sql.Connection,java.sql.Statement,java.sql.DriverManager"
contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h1>Hello World!</h1>

        <%
           String username = request.getParameter("username");
           String password = request.getParameter("password");


           Class.forName("com.mysql.cj.jdbc.Driver");

           Connection con = DriverManager.getConnection("jdbc:mysql://localhost:3306/parul",
"root", "");

           Statement st = con.createStatement();
```

```
        ResultSet rs= st.executeQuery("SELECT * FROM `user` where username='"+username+"'
and password='"+password+"'");

    if(rs.next()){
        System.out.println("login Sucessfull");
      }else {
        out.println("Log in failed !!");
       }



        %>

    </body>
</html>
```

Error.jsp

```
<%--
    Document   : Error
    Created on : 26-Mar-2024, 8:07:59 am
    Author     : hardikparmar
--%>

<%@page isErrorPage="true" contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h1>
           <%= exception%>

        </h1>
    </body>
</html>
```

Pom.xml

```xml
<dependencies>
<dependency>
        <groupId>mysql</groupId>
        <artifactId>mysql-connector-java</artifactId>
        <version>8.0.33</version>
    </dependency>
</dependencies>
```

Bean Example :

Student.java

```java
/**
 *
 * @author hardikparmar
 */
public class Student {

    private int sid;
    private String sname;

    public void setSid(int sid) {
        this.sid = sid;
    }

    public int getSid() {
        return sid;
    }
```

```java
    public void setSname(String sname) {
        this.sname = sname;
    }

    public String getSname() {
        return sname;
    }
}
```

beanData.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <form action="jspBean.jsp">
            SID :   <input type="text" name="sid"> <br />
            sName :   <input type="text" name="sname"> <br />

            <input type="submit" name="submit" value="Save"> <br />
        </form>
    </body>
</html>
```

jspBean.jsp

```jsp
<%--
    Document   : jspBean
    Created on : 27-Mar-2024, 9:00:26 am
    Author     : hardikparmar
--%>
```

```
<%@page import="com.mycompany.divejsp.Student" contentType="text/html"
pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <%
            int sid = Integer.parseInt(request.getParameter("sid"));
            String sname = request.getParameter("sname");
        %>
        <jsp:useBean id="stud" class="com.mycompany.divejsp.Student"  scope="session"/>
        <jsp:setProperty name="stud" property="sid" value="<%= sid%>" />
        <jsp:setProperty name="stud" property="sname" value="<%= sname%>" />
        <%--<jsp:setProperty name="stud" property="*" />--%>
        <br />
        <jsp:getProperty name="stud" property="sid"/>
        <br />
        <jsp:getProperty name="stud" property="sname"/>
    </body>
</html>
```

**Practical 8 : Develop an application for Bank Account information using Java Beans.
This application will perform various operation on bank account like withdraw, deposit
and displaying the information.**

BankAccount.java


```
/**
 *
 * @author hardikparmar
 */
public class BankAccount {

    private String accountNumber;
    private String accountHolderName;
    private double balance;

    /**
```

```java
 * @return the AccountNumber
 */
public String getAccountNumber() {
    return accountNumber;
}

/**
 * @param AccountNumber the AccountNumber to set
 */
public void setAccountNumber(String AccountNumber) {
    this.accountNumber = AccountNumber;
}

/**
 * @return the AccountHolderNumber
 */
public String getAccountHolderName() {
    return accountHolderName;
}

public void setAccountHolderName(String AccountHolderName) {
    this.accountHolderName = AccountHolderName;
}

/**
 * @return the balance
 */
public double getBalance() {
    return balance;
}

/**
 * @param balance the balance to set
 */
public void setBalance(double balance) {
    this.balance = balance;
}

public void withdraw(double amount) {
    if (balance >= amount) {
        balance -= amount;
    }

}
```

```java
    public void deposit(double amount) {
        balance += amount;
    }
}
```

CreateAccount.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
   <head>
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
      <title>JSP Page</title>
   </head>
   <body>
      <h1>Create Bank Account!</h1>

      <form action="BankInfo.jsp">
         Account Number : <input type="text" name="accountNumber" /> <br />
         Account Holder Name : <input type="text" name="accountHolderName" /> <br />
         balance : <input type="text" name="balance" /> <br />
         <input type="submit" value="Create Account" name="submit" /> <br />
      </form>
   </body>
</html>
```

BankInfo.jsp

```jsp
<%@page import="com.mycompany.divejsp.BankAccount" contentType="text/html"
pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
   <head>
      <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
      <title>JSP Page</title>
   </head>
   <body>
      <h1>Account Information!</h1>
```

```jsp
    <jsp:useBean id="account" scope="session"
class="com.mycompany.divejsp.BankAccount" />
    <jsp:setProperty name="account" property="*" /> <br />

    <%
      String wd = request.getParameter("wd");

      if (wd != null) {
        double amount = Double.parseDouble(request.getParameter("amount"));
        if (wd.equals("withdraw")) {
          account.withdraw(amount);
        }
        if (wd.equals("deposit")) {
          account.deposit(amount);
        }

      }
    %>


    Account Number :  <jsp:getProperty name="account" property="accountNumber" /> <br />
    Account Holder name  :  <jsp:getProperty name="account" property="accountHolderName"
/><br />
    Balance :   <jsp:getProperty name="account" property="balance" /><br />


    <h1> withdraw</h1>
    <form>
      <input type="text" name="amount" />
      <input type="hidden" name="wd" value="withdraw"/>
      <input type="submit" value="withdraw" name="withdraw" />
    </form>

    <h1> deposit</h1>
    <form>
      <input type="text" name="amount" />
      <input type="hidden" name="wd" value="deposit"/>
      <input type="submit" value="deposit" name="deposit" />
    </form>
  </body>
</html>
```

Practical 10 : JSP - Application Context
Develop an application that will allow maximum 3 users to access the application. If number of users exceeds than limit then user will be redirected to the error page.

Home.jsp

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
<%
    String uname = (String)session.getAttribute("session");

%>
<h1>Welcome</h1>
<%=uname %>
<form action="Logout" method="post">
    <input type="submit" value="Logout">
</form>

</body>
</html>
```

Error.page

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Insert title here</title>
</head>
<body>
    <h1>Sorry You have exceed Login Limit</h1>
</body>
</html>
```

Web.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd" id="WebApp_ID" version="3.1">
  <display-name>p10</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.htm</welcome-file>
    <welcome-file>default.jsp</welcome-file>
  </welcome-file-list>
</web-app>
```

Login .java

```java
package ajp.exam;

import java.io.IOException;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

/**
 * Servlet implementation class Logout
 */
@WebServlet("/Logout")
public class Logout extends HttpServlet {
    private static final long serialVersionUID = 1L;

    /**
     * @see HttpServlet#HttpServlet()
     */
    public Logout() {
        super();
        // TODO Auto-generated constructor stub
    }

    /**
     * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse
response)
     */
```

```java
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
        // TODO Auto-generated method stub
        //response.getWriter().append("Served at:
").append(request.getContextPath());
    }

    /**
     * @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse
response)
     */
    protected void doPost(HttpServletRequest request, HttpServletResponse
response) throws ServletException, IOException {
        // TODO Auto-generated method stub
        //doGet(request, response);
        int cnt = (int)getServletContext().getAttribute("users");
        getServletContext().setAttribute("users", --cnt);
        request.getSession().invalidate();
        response.sendRedirect("index.html");
    }

}
```

11 Curency conversion

Currency conversion.java

```java
package edu.mca.ajp.Services;

import javax.ws.rs.*;
//import javax.ws.rs.Path;
//import javax.ws.rs.PathParam;
//import javax.ws.rs.Produces;

@Path("/converter")
public class CurrencyConverter {

    @GET
    @Path("/rtod/{amt}")
    @Produces("text/html")
    public String rupee2dollar(@PathParam("amt")float amt)
    {
        float dollar = amt/67;
        return "<b>Converted Dollar : </b>"+dollar+"$";
```

```java
    }

    @GET
    @Path("/dtor/{amt}")
    @Produces("text/html")
    public String dollar2rupee(@PathParam("amt")float amt)
    {
        float dollar = amt*67;
        return "<b>Converted rupees : </b>"+dollar+"$";


    }
}
```

Web.xml

```xml
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd" id="WebApp_ID" version="3.1">
  <display-name>CurrencyConverter</display-name>

  <servlet>
    <servlet-name>Jersey RESTful Application</servlet-name>
    <servlet-class>org.glassfish.jersey.servlet.ServletContainer</servlet-class>
    <init-param>
      <param-name>jersey.config.server.provider.packages</param-name>
      <param-value>edu.mca.ajp.Services</param-value>
    </init-param>
  </servlet>
  <servlet-mapping>
    <servlet-name>Jersey RESTful Application</servlet-name>
    <url-pattern>/rest/*</url-pattern>
  </servlet-mapping>

</web-app>
```

12 Restful service to accept student registration data sent from a web form.

Index.html

```html
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Insert title here</title>
</head>
```

```html
<body>
<form method="post" action="rest/registration">
    <table>
    <tr>
        <td>Student ID</td>
        <td><input type="text" name="txtStudentID"
placeholder="Enter Student ID" maxlength="10"></td>
    </tr>
    <tr>
        <td>Student Name</td>
        <td><input type="text" name="txtStudentName"
placeholder="Enter Student Name" maxlength="30"></td>
    </tr>
    <tr>
        <td>Semester</td>
        <td><input type="number" name="txtSemester" max="6" min="1"
maxlength="5"></td>
    </tr>
            <tr>
                <td>City</td>
                <td><input type="text" name="txtCity"
placeholder="Enter Student City" maxlength="30"></td>
            </tr>
            <tr>
                <td>Contact no.</td>
                <td><input type="text" name="txtContact"
placeholder="Enter Student Contact no." maxlength="10"></td>
            </tr>
            <tr>
                <td><button type="submit">Register</button></td>
                <td><button type="reset">Clear</button></td>
            </tr>
        </table>
    </form>
</body>
</html>
```

Disply.jsp

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO
8859-1">
<title>Insert title here</title>
</head>
```

```
<body>
    <%= session.getAttribute("message") %>
</body>
</html>
```

Registration .java

```
import java.net.URI;
import java.net.URISyntaxException;
import javax.ws.rs.Consumes;
import javax.ws.rs.FormParam;
import javax.ws.rs.POST;
import javax.ws.rs.Path;
import javax.ws.rs.core.Context;
import javax.ws.rs.core.MediaType;
import javax.ws.rs.core.Response;
import javax.servlet.http.HttpServletRequest;

@Path("/registration")

public class Registration {

    @POST
    @Consumes(MediaType.APPLICATION_FORM_URLENCODED)
    public Response addRecord(@FormParam("txtStudentID") String
id,@FormParam("txtStudentName") String name,
         @FormParam("txtSemester") String sem,@FormParam("txtCity") String
city,
         @FormParam("txtContact") String contact,@Context
HttpServletRequest request) throws URISyntaxException
    {
      String str="Student ID : "+id+"<br> Student Name : "+name+"<br>
Semester : "+sem+"<br> City : "+city+"<br> Contact :"+contact;

      request.getSession().setAttribute("message", str);

      return Response.temporaryRedirect(new
URI("/RESTfulStudentRegistration/Display.jsp")).build();
    }
}
```

13. Create JAX-RX service that provide CRUID database operation interface for a phonebook cell appropriate service form servlet/jsp pages to perform data oriented operations.

Index.jsp

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1" import="java.sql.*" %>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO
8859-1">
<title>Phonebook</title>
</head>
<body>
<a href="addrecord.jsp">Add New Contact</a>
<%
    try{
        DriverManager.registerDriver(new com.mysql.jdbc.Driver());
        Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/practical12
","root","");
        Statement stm = con.createStatement();
        ResultSet rs = stm.executeQuery("select * from phonebook");
        %>
        <table>
        <tr>
            <th>ID</th>
            <th>Name</th>
            <th>Number</th>
        </tr>
        <%
        while(rs.next())
            {

                %>
                <tr>
                    <td><%= rs.getInt(1) %></td>
                    <td><%= rs.getString(2) %></td>
                    <td><%= rs.getString(3) %></td>
                    <td> <a
href="http://localhost:8080/Practical13/editrecord.jsp?id=<%=rs.getI
nt(1)%>">Update</a></td>
                    <td> <a
href="http://localhost:8080/Practical13/editrecord.jsp?id=<%=rs.getI
nt(1)%>">Delete</a></td>
                </tr>
                <%
```

```
			}
		%>
		</table>
		<%
	}
	catch(SQLException e)
	{
		e.printStackTrace();
	}
%>


</body>
</html>
```

Addrecode.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
	pageEncoding="ISO-8859-1"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO
8859-1">
<title>Add Record</title>
</head>
<body>
	<form action="rest/service/add" method="post">
		Name <input type="text" name="name">
		Contact No. <input type="text" name="number">
		<input type="submit" value="Save">
	</form>
	<center>
		<%= session.getAttribute("msg") ==
null?"":session.getAttribute("msg") %>
		<% session.removeAttribute("msg"); %>
	</center>
</body>
</html>
```

Editrecode.jsp

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
	pageEncoding="ISO-8859-1" import="java.sql.*"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
```

```html
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO
8859-1">
<title>Edit Record</title>
</head>
<body>
<%
    try
    {
        DriverManager.registerDriver(new com.mysql.jdbc.Driver());
        Connection connection =
DriverManager.getConnection("jdbc:mysql://localhost:3306/practical12
 ","root","");
        Statement statement = connection.createStatement();
        ResultSet rst = statement.executeQuery("select * from
phonebook where id ="+request.getParameter("id"));
        rst.next();
        %>
        <form method="post" action="rest/service/update">
            <input type="hidden" name="id"
value="<%=request.getParameter("id") %>">
            Name <input type="text" name="name"
value="<%=rst.getString(2)%>">
            Number <input type="text" name="number"
value="<%=rst.getString(3)%>">
            <input type="submit" value="Update">
        </form>
        <%
    }catch(Exception e)
    {
        out.println(e.getMessage());
    }

%>

</body>
</html>
```

DBconnection.java

```jsp
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1" import="java.sql.*"%>
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO
8859-1">
<title>Edit Record</title>
```

```
</head>
<body>
<%
    try
    {
        DriverManager.registerDriver(new com.mysql.jdbc.Driver());
        Connection connection =
DriverManager.getConnection("jdbc:mysql://localhost:3306/practical12
","root","");
        Statement statement = connection.createStatement();
        ResultSet rst = statement.executeQuery("select * from
phonebook where id ="+request.getParameter("id"));
        rst.next();
        %>
        <form method="post" action="rest/service/update">
            <input type="hidden" name="id"
value="<%=request.getParameter("id") %>">
            Name <input type="text" name="name"
value="<%=rst.getString(2)%>">
            Number <input type="text" name="number"
value="<%=rst.getString(3)%>">
            <input type="submit" value="Update">
        </form>
        <%
    }catch(Exception e)
    {
        out.println(e.getMessage());
    }

%>

</body>
</html>
```

Sevies.java

```java
package edu.ajp.ws;

import java.net.URI;
import java.net.URISyntaxException;
import java.sql.*;

import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.ws.rs.Consumes;
import javax.ws.rs.FormParam;
import javax.ws.rs.POST;
import javax.ws.rs.Path;
```

```java
import javax.ws.rs.core.Context;
import javax.ws.rs.core.MediaType;
import javax.ws.rs.core.Response;

@Path("/service")
public class Services {



    @POST
    @Path("/add")
    @Consumes(MediaType.APPLICATION_FORM_URLENCODED)
    public Response addRecord(@FormParam("name") String
name,@FormParam("number") String number,@Context HttpServletRequest
request) throws URISyntaxException
    {
        try {

            Statement stetement =
DBConnection.getConnection().createStatement();
            String InsertQuery = "insert into phonebook(name,number)
values('"+name+"','"+number+"')";

            if (stetement.executeUpdate(InsertQuery)>0) {
                request.getSession().setAttribute("msg", "Record Inserted!");
                return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/addrecord.jsp")).build();
            }

            else {
                request.getSession().setAttribute("msg", "Somethig Went
Wrong!");
                return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/addrecord.jsp")).build();
            }
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }

        return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/")).build();
    }

    @POST
    @Path("/update")
    @Consumes(MediaType.APPLICATION_FORM_URLENCODED)
    public Response updateRecord(@FormParam("id") String
id,@FormParam("name") String name,@FormParam("number") String
number,@Context HttpServletRequest request) throws URISyntaxException
```

```java
    {
        try {
            Statement stetement =
DBConnection.getConnection().createStatement();
            String UpdateQuery = "update phonebook set
name='"+name+"',number='"+number+"' where id='"+id+"'";

            if (stetement.executeUpdate(UpdateQuery)>0) {
                request.getSession().setAttribute("msg", "Record Updated!");
                return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/")).build();
            }

            else {
                request.getSession().setAttribute("msg", "Somethig Went
Wrong!");
                return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/")).build();
            }
        } catch (Exception e) {
            System.out.println(e.getMessage());
        }
        return Response.temporaryRedirect(new
URI("http://localhost:8080/Practical13/")).build();
    }

}
```