**MALAD KANDIVALI EDUCATION SOCIETY'S**
**NAGINDAS KHANDWALA COLLEGE OF COMMERCE,**
**ARTS & MANAGEMENT STUDIES & SHANTABEN NAGINDAS**
**KHANDWALA COLLEGE OF SCIENCE**
**MALAD [W], MUMBAI – 64**
**(AUTONOMOUS)**

**(Reaccredited 'A' Grade by NAAC)**
**(AFFILIATED TO UNIVERSITY OF MUMBAI)**
**(ISO 9001:2015)**

# CERTIFICATE

**Name: Mr./Ms.** Shibu Mohapatra

**Roll No:** 2 **Programme**: MSc CS (Artificial Intelligence) **Semester**: II

This is certified to be a bonafide record of practical works done by the above student in the college laboratory for the course **ADVANCED JAVA PROGRAMMING** (Course Code: **2127PSAIPR**) for the partial fulfillment of Second Semester of MSc AI during the academic year 2021-2022.

The journal work is the original study work that has been duly approved in the year 2021-2022 by the undersigned.

**External Examiner**

**(Subject-In-Charge)**
**Dr. Pragati Hiwarkar**

**Date of Examination:** **(College Stamp)**

**Subject:** Advanced Java Programming

**Branch:** MSc CS (Artificial Intelligence)

## List of Experiments

| Sr. No. | Date | Aim | Sign |
|---|---|---|---|
| | | **SERVLET** | |
| 1. | 05/02/22 | Develop dynamic web application to display current system date and time using servlets. | |
| 2 | 08/02/22 | Develop dynamic web application to display login page with proper HTML UI elements using servlets.<br>OR<br>Implement a JAVA Servlet Program to implement a dynamic HTML using Servlet (user name and password should be accepted using HTML and displayed using a Servlet). | |
| 3 | 08/02/22 | Implement a servlet to authenticate login details, which is created previously (user name and password should be accepted using HTML and displayed using a Servlet) | |
| 4 | 11/02/22 | Develop dynamic web application to manage product (prodId, name, category, price) details using servlets. This app must have following pages<br>a. Home page<br>b. Product adding page<br>c. Product editing page<br>d. Product displaying page | |
| 5 | 15/02/22 | Design a JAVA Servlet Program to Download a file and display it on the screen (A link has to be provided in HTML, when the link is clicked corresponding file has to be displayed on Screen). | |
| 6 | 18/02/22 | a) Design a JAVA Servlet Program to implement Request Dispatcher object using include() and forward() methods.<br>b) Implement a JAVA Servlet Program to implement sessions using HTTP Session Interface. | |
| | | **JSP** | |
| 1 | 21/02/22 | Develop dynamic web application to manage user (userId, name, dob, address) details using JSP. This app must have following pages<br>a. Home page<br>b. User adding page<br>c. User editing page<br>d. User displaying page | |

| | | | |
|---|---|---|---|
| 2 | 22/02/22 | Write JSP program to implement custom tag with name <product>, which display product (prodId, name, category, price) details | |
| 3 | 25/02/22 | Design a JAVA JSP Program to implement verification of a particular user login and display a welcome page | |
| 4 | 28/02/22 | Write a program to design a simple calculator using JSP | |
| **JSF** | | | |
| 1 | 03/03/22 | Write a JSF application to print Hello World | |
| 2 | 05/03/22 | Write a JSF application for Celsius to Fahrenheit convertor | |
| 3 | 11/03/22 | Design following JSF application to accept username in textbox. if user textbox is empty show validation message | |
| 4 | 15/03/22 | A web application that takes a name as input and on submit it shows a hello <name> page where name is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name > message with the duration of usage (hint: Use session to store name and time). | |
| **HIBERNATE** | | | |
| 1 | 17/03/22 | Creating hibernate example to print “Hello Word” | |
| 2 | 28/03/22 | A) Create Maven Project for hibernate to add dependencies<br>B) Configure hibernate program | |
| 3 | 29/03/22 | Write hibernate program to save student data using annotation | |
| 4 | 29/03/22 | Write hibernate program to save image in database | |
| **SPRING** | | | |
| 1 | 08/04/22 | Create new Maven Project to add Spring Dependencies using setter injection | |
| 2 | 09/04/22 | Create new Maven Project for property injection using p Schema and using value as attribute | |
| 3 | 11/04/22 | Create project to implement injecting collection types: List, Set Map and Properties | |

| | | | |
|---|---|---|---|
| 4 | 12/04/22 | Create project to implement constructor injection | |
| 5 | 13/04/22 | Write a Spring program for implementing Bean lifecycle method using XML | |
| 6 | 18/04/22 | Create Application for Spring JDBC concept (insert) | |
| 7 | 19/04/22 | Create Application for Spring MVC | |

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# SERVLET

1. **Write a servlet application to print the current date and time.**

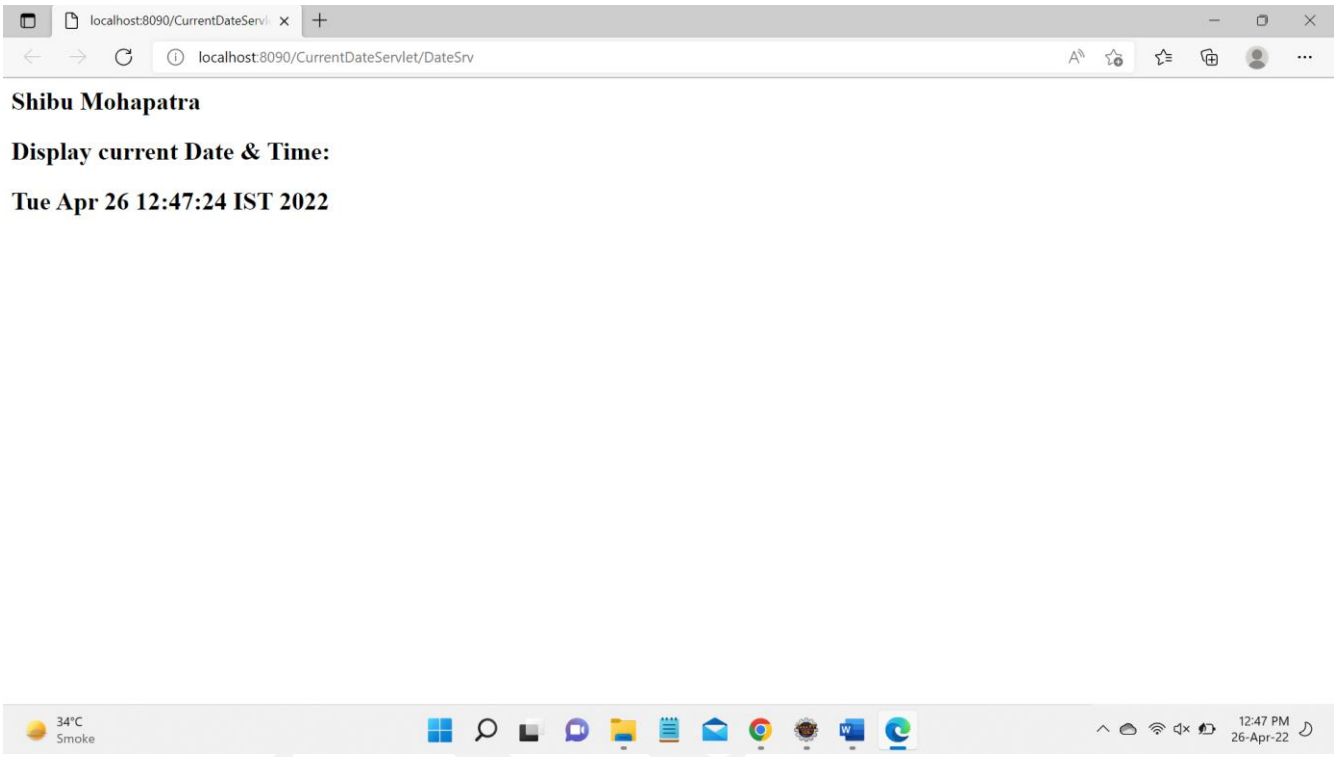
**Code:**

**DateSrv.java**

```
package com.srccodes.example;
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;
import javax.servlet.*;
import java.io.*;
import java.util.*;

/**
 * Servlet implementation class DateSrv
 */
@SuppressWarnings("serial")
@WebServlet("/DateSrv")
public class DateSrv extends GenericServlet
{
    //implement service()
    public void service(ServletRequest req, ServletResponse res) throws IOException,
ServletException
    {
        //set response content type
        res.setContentType("text/html");

        //get stream obj
        PrintWriter pw = res.getWriter();

        //write req processing logic
        java.util.Date date = new java.util.Date();
        pw.println("<h2> Shibu Mohapatra <h2>");
        pw.println("<h2>"+"Display current Date & Time: <h2>\n" + date.toString());


        pw.close();
```

```
    }
}
```

**Output:**


localhost:8090/CurrentDateServl
localhost:8090/CurrentDateServlet/DateSrv
Shibu Mohapatra
Display current Date & Time:
Tue Apr 26 12:47:24 IST 2022
34°C
Smoke
12:47 PM
26-Apr-22

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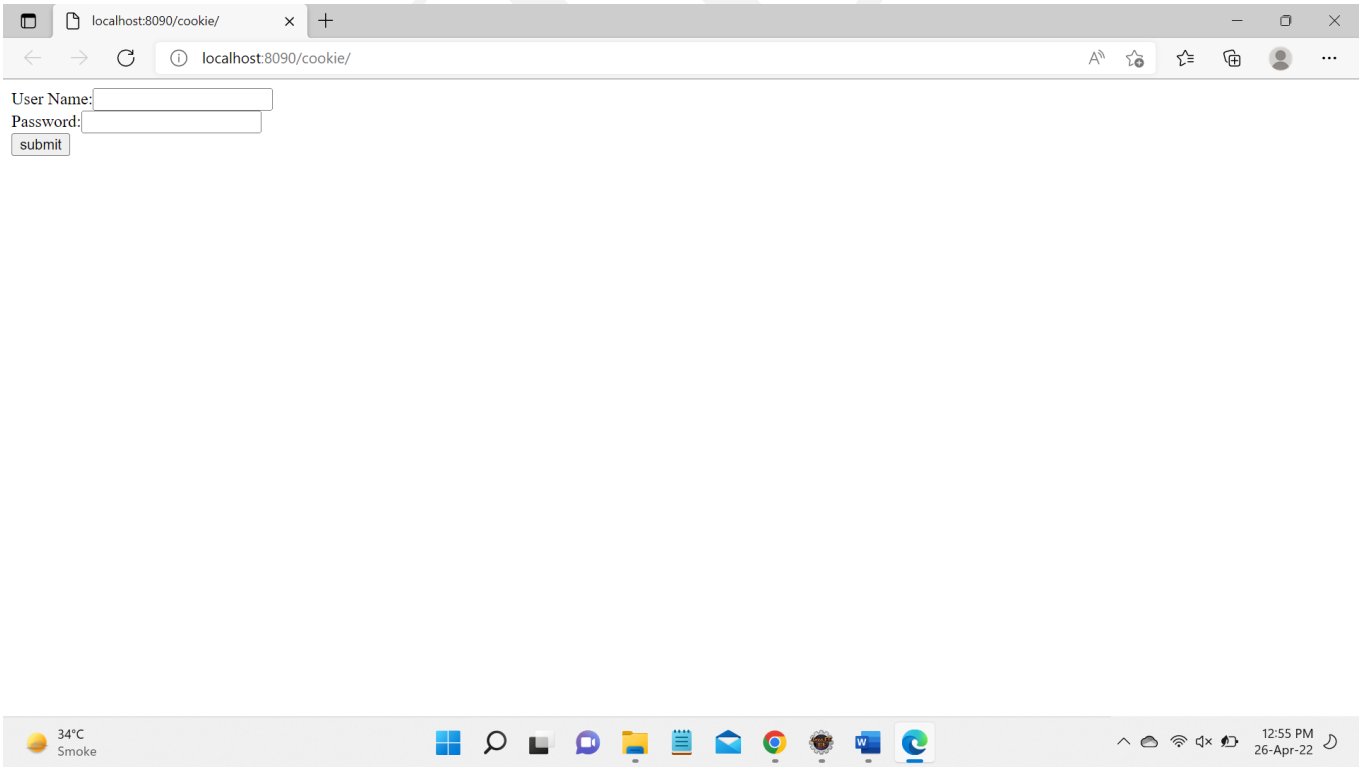
2. **Develop dynamic web application to display login page with proper HTML UI elements using servlets.**
   **OR**
   **Implement a JAVA Servlet Program to implement a dynamic HTML using Servlet (user name and password should be accepted using HTML and displayed using a Servlet).**

**Code:**

**Index.html –**

```
<form action="login">
 User Name:<input type="text" name="userName"/><br/>
 Password:<input type="password" name="userPassword"/><br/>
 <input type="submit" value="submit"/>
</form>
```

**Output:**



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**Code:**

**MyServlet1.java –**

```
import java.io.PrintWriter;

import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
@SuppressWarnings("serial")
public class MyServlet1 extends HttpServlet
{
  public void doGet(HttpServletRequest request,
    HttpServletResponse response) {
    try{
       response.setContentType("text/html");
       PrintWriter pwriter = response.getWriter();

       String name = request.getParameter("userName");
       String password = request.getParameter("userPassword");
       pwriter.print("Hello "+name);
       pwriter.print(" Your Password is: "+password);

       //Creating two cookies
       Cookie c0=new Cookie("userName",name);
       Cookie c1=new Cookie("userPassword",password);

       //Adding the cookies to response header
       response.addCookie(c0);
       response.addCookie(c1);
       pwriter.print("<br><a href='welcome'>View Details</a>");
       pwriter.close();
  }catch(Exception exp){
     System.out.println(exp);
   }
 }
}
```

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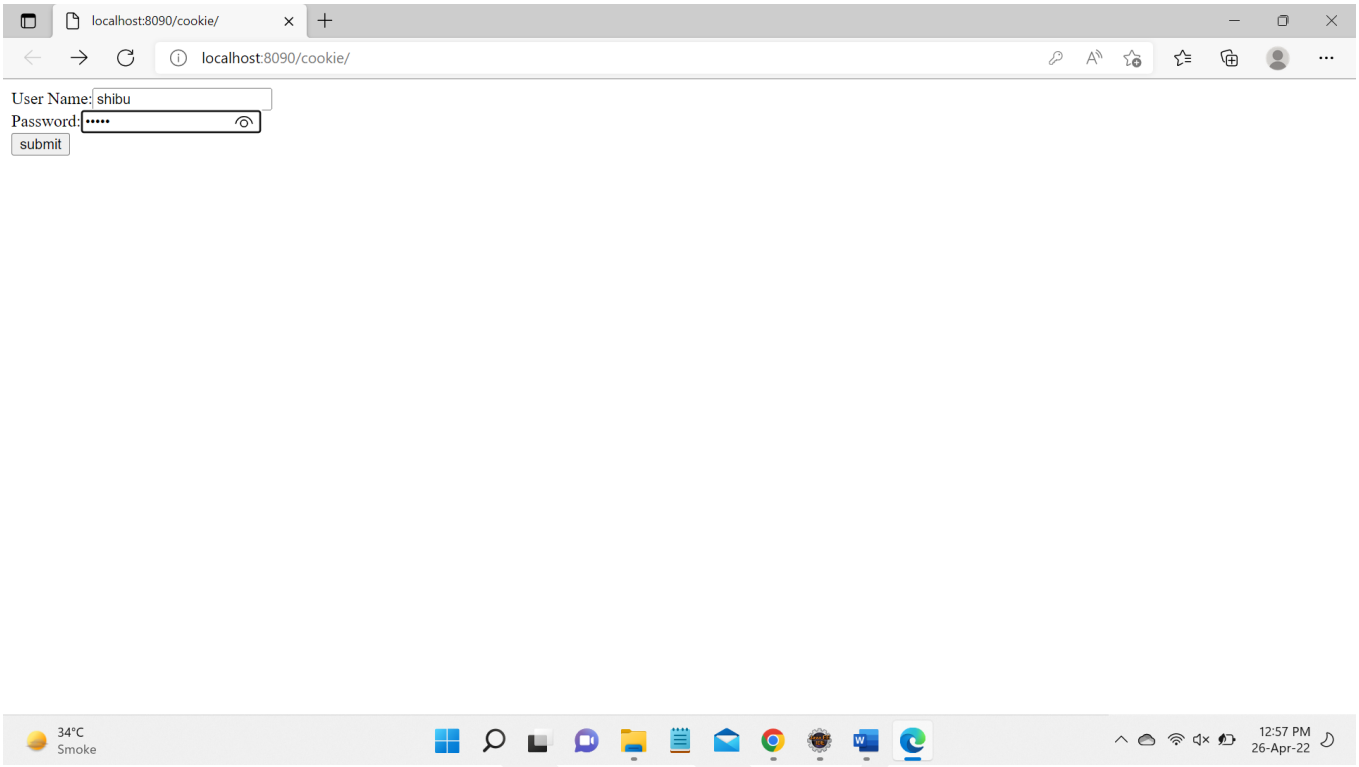
## Output:



3. **Implement a servlet to authenticate login details, which is created previously (user name and password should be accepted using HTML and displayed using a Servlet)**

**Code:**

**MyServlet2.java –**

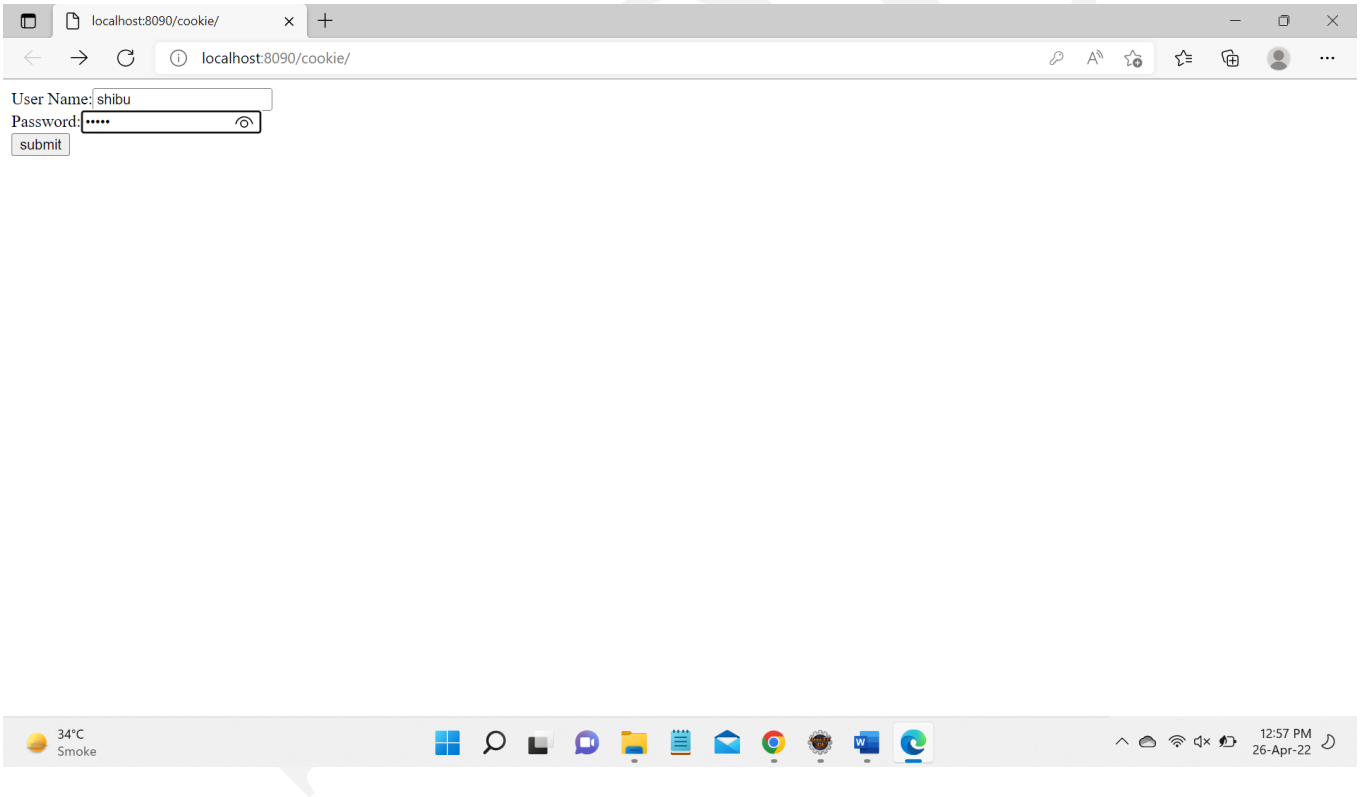
```
import java.io.PrintWriter;

import javax.servlet.http.Cookie;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@SuppressWarnings("serial")
public class MyServlet2 extends HttpServlet {
 public void doGet(HttpServletRequest request,
   HttpServletResponse response){
   try{
     response.setContentType("text/html");
     PrintWriter pwriter = response.getWriter();

     //Reading cookies
     Cookie c[]=request.getCookies();
     //Displaying User name value from cookie
     pwriter.print("Name: "+c[0].getValue());
     //Displaying user password value from cookie
     pwriter.print("Password: "+c[1].getValue());

     pwriter.close();
   }catch(Exception exp){
     System.out.println(exp);
```

**Web.xml**

```
<web-app>
        <display-name>cookie</display-name>
        <welcome-file-list>
                <welcome-file>index.html</welcome-file>
        </welcome-file-list>
        <servlet>
                <servlet-name>Servlet1</servlet-name>
                <servlet-class>MyServlet1</servlet-class>
        </servlet>
```

```
        <servlet-mapping>
                <servlet-name>Servlet1</servlet-name>
                <url-pattern>/login</url-pattern>
        </servlet-mapping>
        <servlet>
                <servlet-name>Servlet2</servlet-name>
                <servlet-class>MyServlet2</servlet-class>
        </servlet>
        <servlet-mapping>
                <servlet-name>Servlet2</servlet-name>
                <url-pattern>/welcome</url-pattern>
        </servlet-mapping>
</web-app>
```

**Output:**



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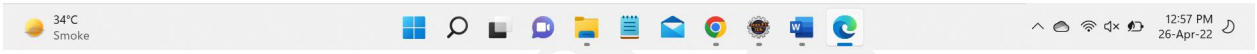
Hello shibu Your Password is: shibu
View Details





Name: shibuPassword: shibu

4. **Develop dynamic web application to manage product (prodId, name, category, price) details using servlets. This app must have following pages**
    a) **Home page**
    b) **Product adding page**
    c) **Product editing page**
    d) **Product displaying page**

**Code:**

**Servlet:**

**ProductController.java:**

```
package com.gl.demo.controller;

import java.io.IOException;
import java.sql.SQLException;
import java.util.List;

import javax.servlet.RequestDispatcher;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

import com.gl.demo.dto.ProductDTO;
import com.gl.demo.service.ProductService;
import com.gl.demo.service.ProductServiceImpl;

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

	private ProductService productService;

	public void init() {
		String jdbcURL = getServletContext().getInitParameter("dbURL");
		String jdbcUsername = getServletContext().getInitParameter("dbUsername");
		String jdbcPassword = getServletContext().getInitParameter("dbPassword");

		this.productService = new ProductServiceImpl(jdbcURL, jdbcUsername,
jdbcPassword);
```

```
	}

    /**
     * @see HttpServlet#HttpServlet()
     */
    public ProductController() {
    }

	/**
	 * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
	 */
	protected void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {

		String action = request.getParameter("action") != null ?
request.getParameter("action") : "none";
		try {
			switch (action) {
			case "new":
				RequestDispatcher dispatcher =
request.getRequestDispatcher("newProductForm.jsp");
				dispatcher.forward(request, response);
				break;
			case "insert":
				String name = request.getParameter("name");
				String des = request.getParameter("description");
				float price = Float.parseFloat(request.getParameter("price"));

				ProductDTO newProduct = new ProductDTO(name, des, price);
				this.productService.addNewProduct(newProduct);
				response.sendRedirect("product");
				break;
			case "delete":
				break;
			case "edit":
				this.showEditForm(request, response);
				break;
			case "update":
				this.updateProduct(request, response);
				break;
			default:
				this.getListProduct(request, response);
				break;
			}
		} catch (SQLException e) {
			e.printStackTrace();
```

```
		}
	}

	/**
	 * @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)
	 */
	protected void doPost(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
		doGet(request, response);
	}

	private void getListProduct(HttpServletRequest request, HttpServletResponse response)
throws SQLException, ServletException, IOException{
		List<ProductDTO> listBook = this.productService.getAllProducts();
		request.setAttribute("listProduct", listBook);
		RequestDispatcher dispatcher = request.getRequestDispatcher("productList.jsp");
		dispatcher.forward(request, response);
	}

	private void showEditForm(HttpServletRequest request, HttpServletResponse response)
			throws SQLException, ServletException, IOException {
		int id = Integer.parseInt(request.getParameter("id"));
		ProductDTO existingBook = this.productService.getProductById(id);
		RequestDispatcher dispatcher =
request.getRequestDispatcher("newProductForm.jsp");
		request.setAttribute("product", existingBook);
		dispatcher.forward(request, response);

	}
	private void updateProduct(HttpServletRequest request, HttpServletResponse response)
throws SQLException, IOException {
		int id = Integer.parseInt(request.getParameter("id"));
		String name = request.getParameter("name");
		String des = request.getParameter("description");
		float price = Float.parseFloat(request.getParameter("price"));

		ProductDTO newProduct = new ProductDTO(id, name, des, price);
		this.productService.updateProduct(newProduct);
		response.sendRedirect("product");
	}
}
```

**Data Access Object (DAO):**

**ProductDAO.java:**

```
package com.gl.demo.dao;

import java.sql.SQLException;
import java.util.List;

import com.gl.demo.dto.ProductDTO;

/**
 * Interface for Product DAO.
 *
 */
public interface ProductDAO {
	List<ProductDTO> getAllProducts() throws SQLException;
	boolean addNewProduct(ProductDTO newProduct) throws SQLException;
	boolean updateProduct(ProductDTO product) throws SQLException;
	boolean deleteProduct(ProductDTO product)throws SQLException;
	ProductDTO getProductById(int id) throws SQLException;
}
```

**ProductDAOImpl.java:**

```
package com.gl.demo.dao;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import java.util.ArrayList;
import java.util.List;

import com.gl.demo.dto.ProductDTO;

/**
 * Product DAO Implement.
 *
 */
public class ProductDAOImpl implements ProductDAO{

	private String jdbcURL;
```

```
	private String jdbcUsername;
	private String jdbcPassword;
	private Connection jdbcConnection;

	public ProductDAOImpl(String jdbcURL, String jdbcUsername, String jdbcPassword) {
		super();
		this.jdbcURL = jdbcURL;
		this.jdbcUsername = jdbcUsername;
		this.jdbcPassword = jdbcPassword;
	}

	protected void connect() throws SQLException {
		if (jdbcConnection == null || jdbcConnection.isClosed()) {
			try {
				Class.forName("com.mysql.cj.jdbc.Driver");
			} catch (ClassNotFoundException e) {
				throw new SQLException(e);
			}
			jdbcConnection = DriverManager.getConnection(
					jdbcURL, jdbcUsername, jdbcPassword);
		}
	}

	protected void disconnect() throws SQLException {
		if (jdbcConnection != null && !jdbcConnection.isClosed()) {
			jdbcConnection.close();
		}
	}

	@Override
	public List<ProductDTO> getAllProducts() throws SQLException {
		List<ProductDTO> listProd = new ArrayList<ProductDTO>();

		String sql = "SELECT * FROM product";

		connect();

		Statement statement = jdbcConnection.createStatement();
		ResultSet resultSet = statement.executeQuery(sql);

		while (resultSet.next()) {
			int id = resultSet.getInt("product_id");
			String name = resultSet.getString("name");
			String des = resultSet.getString("description");
			float price = resultSet.getFloat("price");
```

```
                ProductDTO product = new ProductDTO(id, name, des, price);
                listProd.add(product);
            }
            resultSet.close();
            statement.close();

            disconnect();

            return listProd;
        }

        @Override
        public boolean addNewProduct(ProductDTO newProduct) throws SQLException {
            String sqlInsert = "INSERT INTO product (name, description, price) VALUES
(?, ?, ?)";
            connect();
            PreparedStatement statement = jdbcConnection.prepareStatement(sqlInsert);
            statement.setString(1, newProduct.getName());
            statement.setString(2, newProduct.getDescription());
            statement.setFloat(3, newProduct.getPrice());

            boolean rowInserted = statement.executeUpdate() > 0;
            statement.close();
            disconnect();
            return rowInserted;
        }

        @Override
        public boolean updateProduct(ProductDTO product) throws SQLException {
            String sql = "UPDATE product SET name = ?, description = ?, price = ?
WHERE product_id = ?";
            connect();

            PreparedStatement statement = jdbcConnection.prepareStatement(sql);
            statement.setString(1, product.getName());
            statement.setString(2, product.getDescription());
            statement.setFloat(3, product.getPrice());
            statement.setInt(4, product.getId());

            boolean rowUpdated = statement.executeUpdate() > 0;
            statement.close();
            disconnect();
            return rowUpdated;
        }

        @Override
```

```
    public boolean deleteProduct(ProductDTO product) throws SQLException {
        String sql = "DELETE FROM book where product_id = ?";
        connect();

        PreparedStatement statement = jdbcConnection.prepareStatement(sql);
        statement.setInt(1, product.getId());

        boolean rowDeleted = statement.executeUpdate() > 0;
        statement.close();
        disconnect();
        return rowDeleted;
    }

    @Override
    public ProductDTO getProductById(int id) throws SQLException {
        ProductDTO prod = null;
        String sql = "SELECT * FROM product WHERE product_id = ?";

        connect();

        PreparedStatement statement = jdbcConnection.prepareStatement(sql);
        statement.setInt(1, id);

        ResultSet resultSet = statement.executeQuery();

        if (resultSet.next()) {
            String title = resultSet.getString("name");
            String author = resultSet.getString("description");
            float price = resultSet.getFloat("price");

            prod = new ProductDTO(id, title, author, price);
        }

        resultSet.close();
        statement.close();

        return prod;
    }
}
```

**Data Transfer Object:**

**ProductDTO.java:**

```
package com.gl.demo.dto;

public class ProductDTO {
	private int id;
	private String name;
	private String description;
	private float price;

	public int getId() {
		return id;
	}
	public ProductDTO(int id, String name, String description, float price) {
		super();
		this.id = id;
		this.name = name;
		this.description = description;
		this.price = price;
	}

	public ProductDTO(String name, String description, float price) {
		super();
		this.name = name;
		this.description = description;
		this.price = price;
	}
	public void setId(int id) {
		this.id = id;
	}
	public String getName() {
		return name;
	}
	public void setName(String name) {
		this.name = name;
	}
	public String getDescription() {
		return description;
	}
	public void setDescription(String description) {
		this.description = description;
	}
	public float getPrice() {
		return price;
	}
```

```
	public void setPrice(float price) {
		this.price = price;
	}
}
```

**ProductService.java:**

```
package com.gl.demo.service;

import java.sql.SQLException;
import java.util.List;

import com.gl.demo.dto.ProductDTO;

/**
 * Interface for Product Service.
 *
 */
public interface ProductService {
	List<ProductDTO> getAllProducts() throws SQLException;
	boolean addNewProduct(ProductDTO newProduct) throws SQLException;
	boolean updateProduct(ProductDTO product) throws SQLException;
	boolean deleteProduct(ProductDTO product)throws SQLException;
	ProductDTO getProductById(int id) throws SQLException;
}
```

**ProductServiceImpl.java:**

```
package com.gl.demo.service;

import java.sql.SQLException;
import java.util.List;

import com.gl.demo.dao.ProductDAO;
import com.gl.demo.dao.ProductDAOImpl;
import com.gl.demo.dto.ProductDTO;

/**
 * Product Service Implement.
 *
 */
public class ProductServiceImpl implements ProductService{
	private ProductDAO productDAO;
```

```
	public ProductServiceImpl(String jdbcURL, String jdbcUsername, String jdbcPassword)
{
		this.productDAO = new ProductDAOImpl(jdbcURL, jdbcUsername,
jdbcPassword);
	}

	@Override
	public List<ProductDTO> getAllProducts() throws SQLException {
		return this.productDAO.getAllProducts();
	}

	@Override
	public boolean addNewProduct(ProductDTO newProduct) throws SQLException {
		return this.productDAO.addNewProduct(newProduct);
	}

	@Override
	public boolean updateProduct(ProductDTO product) throws SQLException {
		return this.productDAO.updateProduct(product);
	}

	@Override
	public boolean deleteProduct(ProductDTO product) throws SQLException {
		return this.productDAO.deleteProduct(product);
	}

	@Override
	public ProductDTO getProductById(int id) throws SQLException {
		return this.productDAO.getProductById(id);
	}

}
```

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**JSP:**

**productList.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>
<!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">
<link rel="stylesheet" href="${pageContext.request.contextPath}/css/productList.css" />
<title>List of Products</title>
</head>
<body>
        <div class="survey-page">
      <h1 id="title">Home Page Product</h1>
      <div id="form-container">
      <h2>
         <a href="product?action=new">Add New Product</a>

      </h2>
      <table cellpadding="5">
         <tr>
            <th>ID</th>
            <th>Name</th>
            <th>Description</th>
            <th>Price</th>
            <th>Actions</th>
         </tr>
         <c:forEach var="product" items="${listProduct}">
            <tr>
               <td><c:out value="${product.id}" /></td>
               <td><c:out value="${product.name}" /></td>
               <td><c:out value="${product.description}" /></td>
               <td><c:out value="${product.price}" /></td>
               <td>
                  <a href="product?action=edit&id=<c:out value='${product.id}' />">Edit</a>
                      
                  <a href="product?action=delete&id=<c:out value='${product.id}'
/>">Delete</a>
               </td>
            </tr>
         </c:forEach>
      </table>
      </div>
```

```
   </div>
</body>
</html>
```

**newProductForm.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>
<!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">
<link rel="stylesheet" href="${pageContext.request.contextPath}/css/newProduct.css" />
<title>Add new Product</title>
</head>
<body>
        <div class="survey-page">
      <h1 id="title">Product Editing/Adding Page</h1>
      <div id="form-container">
        <p id="description">
          Input product information to add or edit a product
        </p>
        <h2>
         <a href="product">List All Products</a>    
         <a href="product?action=new">Add New Product</a>
              </h2>
        <c:if test="${product != null}">
                              <form action="product?action=update" method="get">
              </c:if>
              <c:if test="${product == null}">
                                  <form action="product?action=insert" method="get">
              </c:if>
              <c:if test="${product != null}">
                        <input type="hidden" name="id" class="input-field" value="<c:out
value='${product.id}'/>"/>
         </c:if>
          <div class="formRow">
            <label id="name-label" class="label-cls" for="name">* Name: </label>
            <div class="input-col">
              <input autofocus type="text" name="name" id="name" class="input-field"
value="<c:out value='${product.name}'/>"
              placeholder="Enter product name" required >
            </div>
```

```
            </div>
            <div class="formRow">
              <label id="email-label" class="label-cls" for="email">* Description: </label>
              <div class="input-col">
                <input type="text" name="description" id="email" class="input-field"
value="<c:out value='${product.description}'/>"
                required placeholder="Enter description" >
              </div>
            </div>
            <div class="formRow">
              <label id="number-label" class="label-cls" for="age">* Price: </label>
              <div class="input-col">
                <input type="number" name="price" id="number"  class="input-field"
value="<c:out value='${product.price}'/>"
                placeholder="Enter product price" >
              </div>
            </div>

            <button id="submit" type="submit">Submit</button>
          </form>
        </div>
      </div>
    </div>

</body>
</html>
```

**Web.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://JAVA.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-
app_3_0.xsd" id="WebApp_ID" version="3.0">
  <display-name>ProductManagement</display-name>
  <welcome-file-list>
    <welcome-file>ProductController</welcome-file>
  </welcome-file-list>
  <servlet>
        <servlet-name>ProductController</servlet-name>
        <servlet-class>com.gl.demo.controller.ProductController</servlet-class>
  </servlet>
  <servlet-mapping>
        <servlet-name>ProductController</servlet-name>
        <url-pattern>/product</url-pattern>
```

```
  </servlet-mapping>

  <context-param>
        <param-name>dbURL</param-name>
        <param-value>jdbc:mysql://localhost:3306/ProductManagement</param-value>
</context-param>

<context-param>
        <param-name>dbUsername</param-name>
        <param-value>root</param-value>
</context-param>

<context-param>
        <param-name>dbPassword</param-name>
        <param-value>shibu@ninja</param-value>
</context-param>

</web-app>
```

**Pom.xml:**

```
<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 https://maven.apache.org/xsd/maven-
4.0.0.xsd">
        <modelVersion>4.0.0</modelVersion>
        <groupId>ProjectManagement</groupId>
        <artifactId>ProjectManagement</artifactId>
        <version>0.0.1-SNAPSHOT</version>
        <packaging>war</packaging>

        <dependencies>
                <dependency>
                        <groupId>javax.servlet</groupId>
                        <artifactId>javax.servlet-api</artifactId>
                        <version>3.1.0</version>
                        <scope>provided</scope>
                </dependency>
                <dependency>
                        <groupId>javax.servlet.jsp</groupId>
                        <artifactId>javax.servlet.jsp-api</artifactId>
                        <version>2.3.3</version>
                        <scope>provided</scope>
                </dependency>
                <dependency>
```

```
                <groupId>javax.servlet</groupId>
                <artifactId>jstl</artifactId>
                <version>1.2</version>
            </dependency>
            <dependency>
                <groupId>mysql</groupId>
                <artifactId>mysql-connector-java</artifactId>
                <version>8.0.20</version>
            </dependency>

        </dependencies>

        <build>
            <plugins>
                <plugin>
                    <artifactId>maven-compiler-plugin</artifactId>
                    <version>3.8.1</version>
                    <configuration>
                        <release>17</release>
                    </configuration>
                </plugin>
                <plugin>
                    <artifactId>maven-war-plugin</artifactId>
                    <version>3.2.3</version>
                </plugin>
            </plugins>
        </build>
</project>
```

**MySQL:**

- CREATE DATABASE ProductManagement;
- USE ProductManagement;
- CREATE TABLE product (product_id int(11) NOT NULL AUTO_INCREMENT, name varchar(128) NOT NULL, description varchar(255) NOT NULL, price float NOT NULL, PRIMARY KEY (product_id), UNIQUE KEY product_id_UNIQUE (product_id), UNIQUE KEY name_UNIQUE (name));

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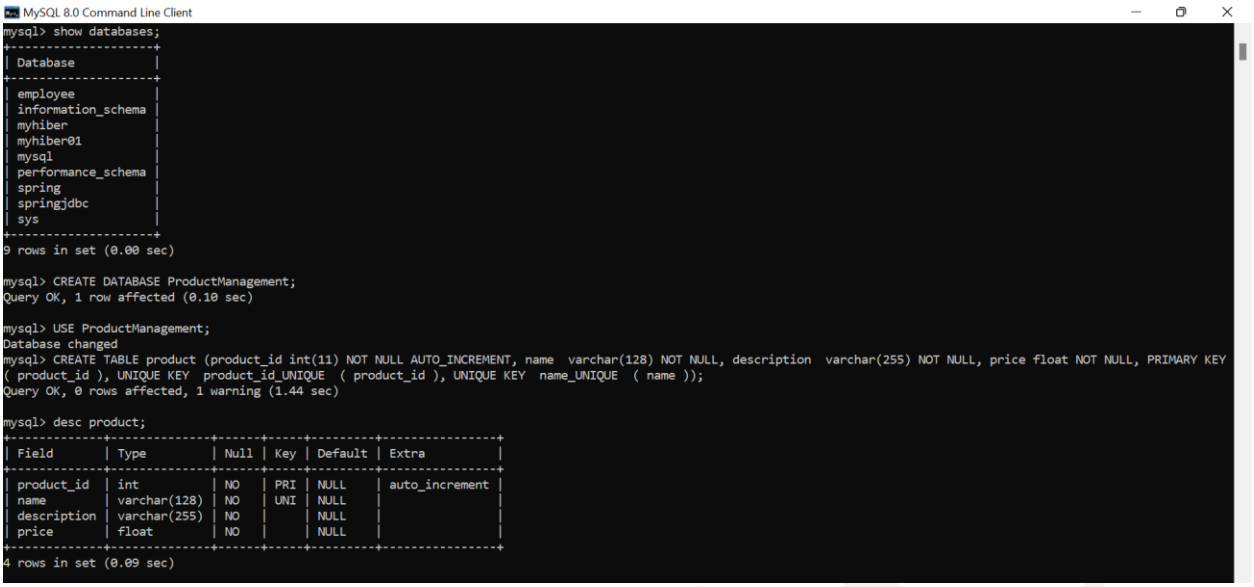
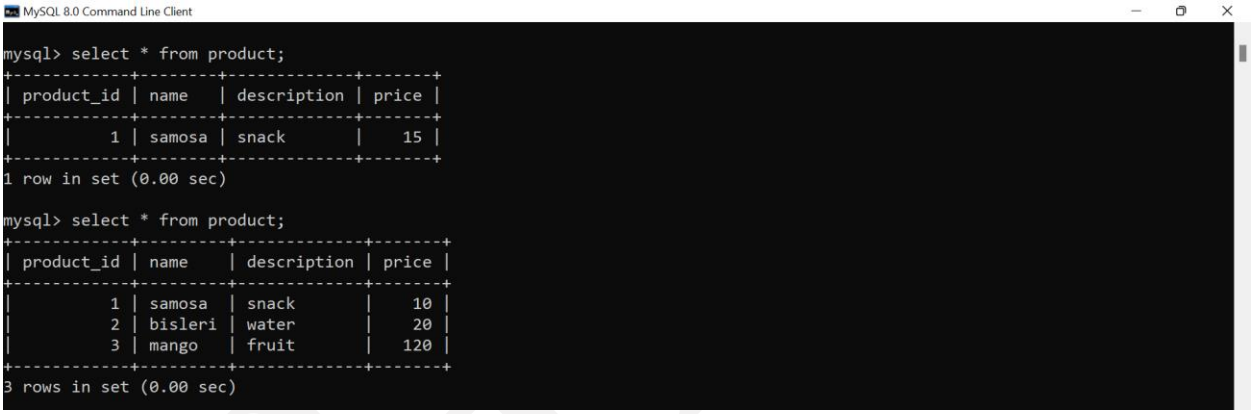
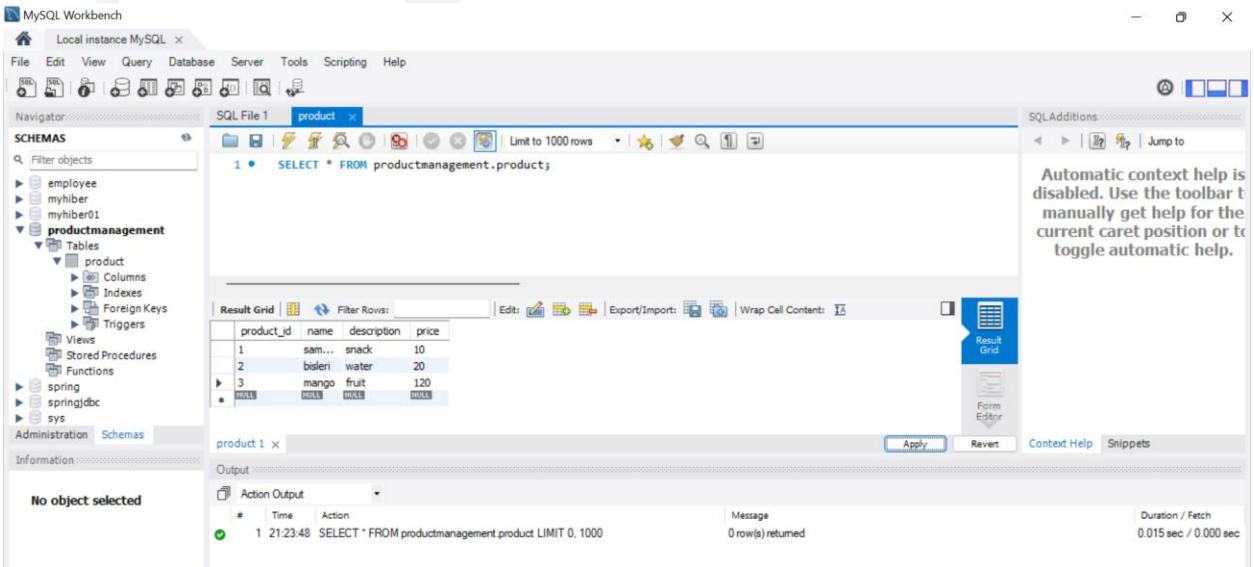



## Workbench:



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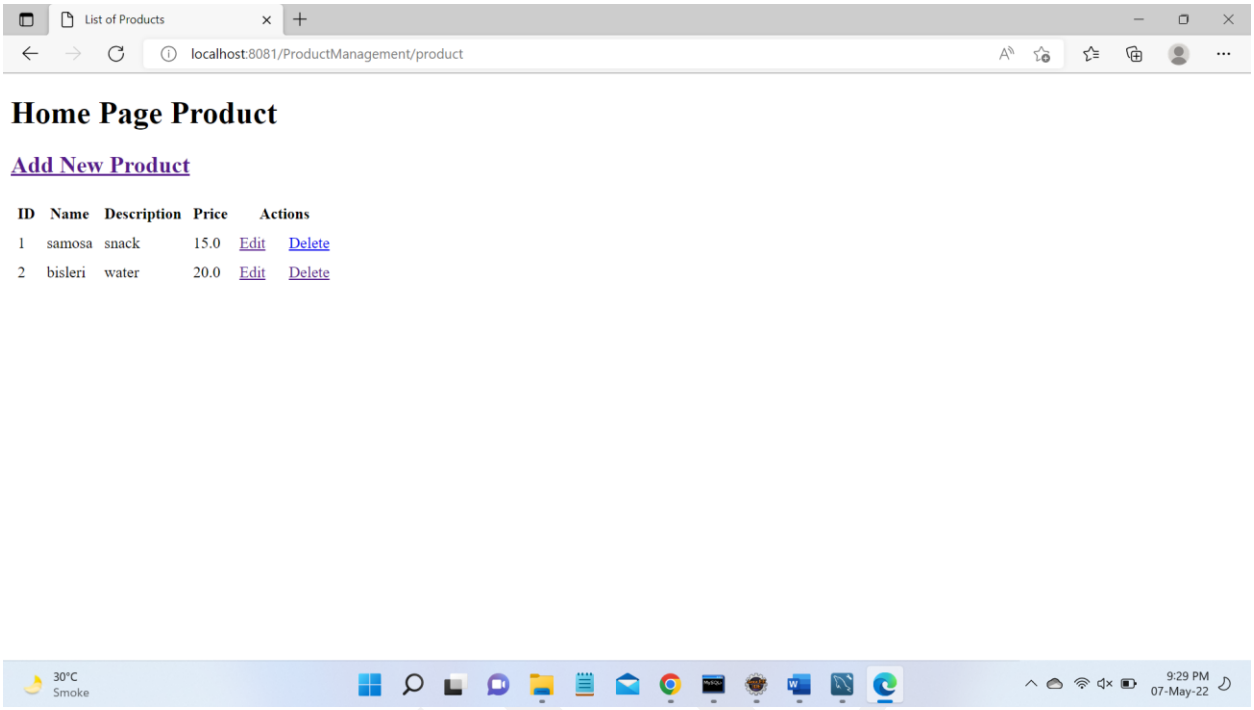
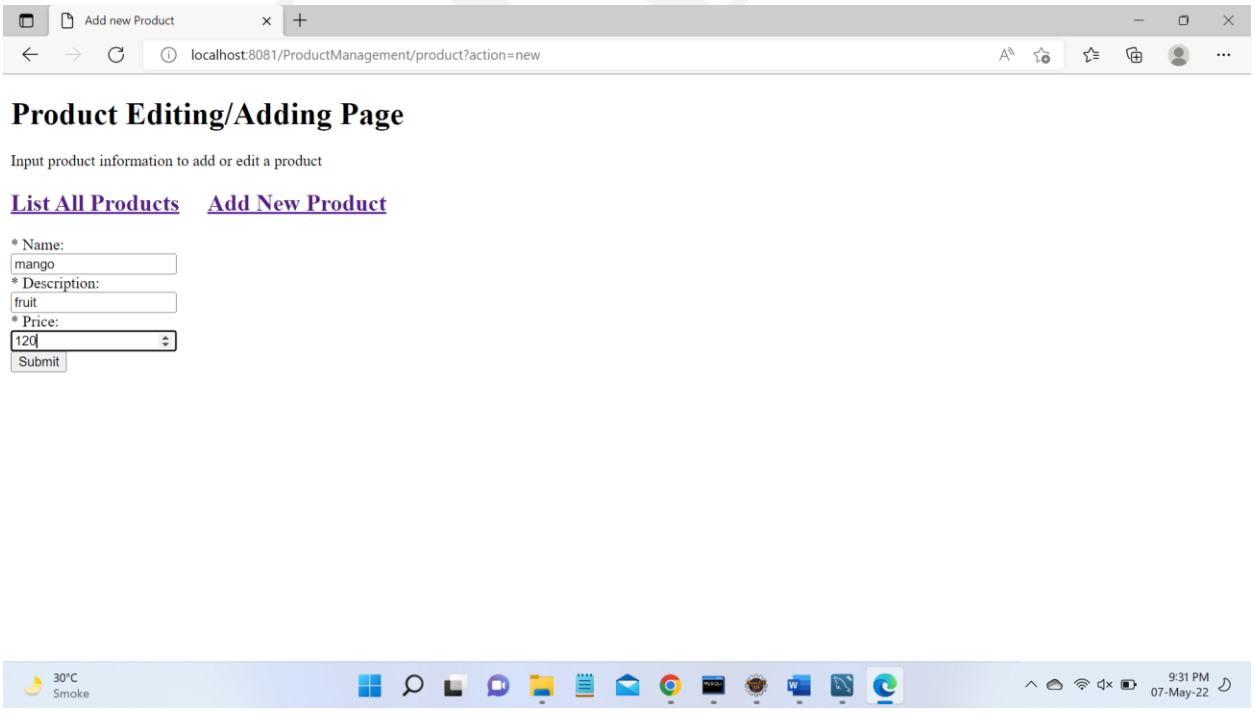
## Output:

## Home Page:




## Product adding page:



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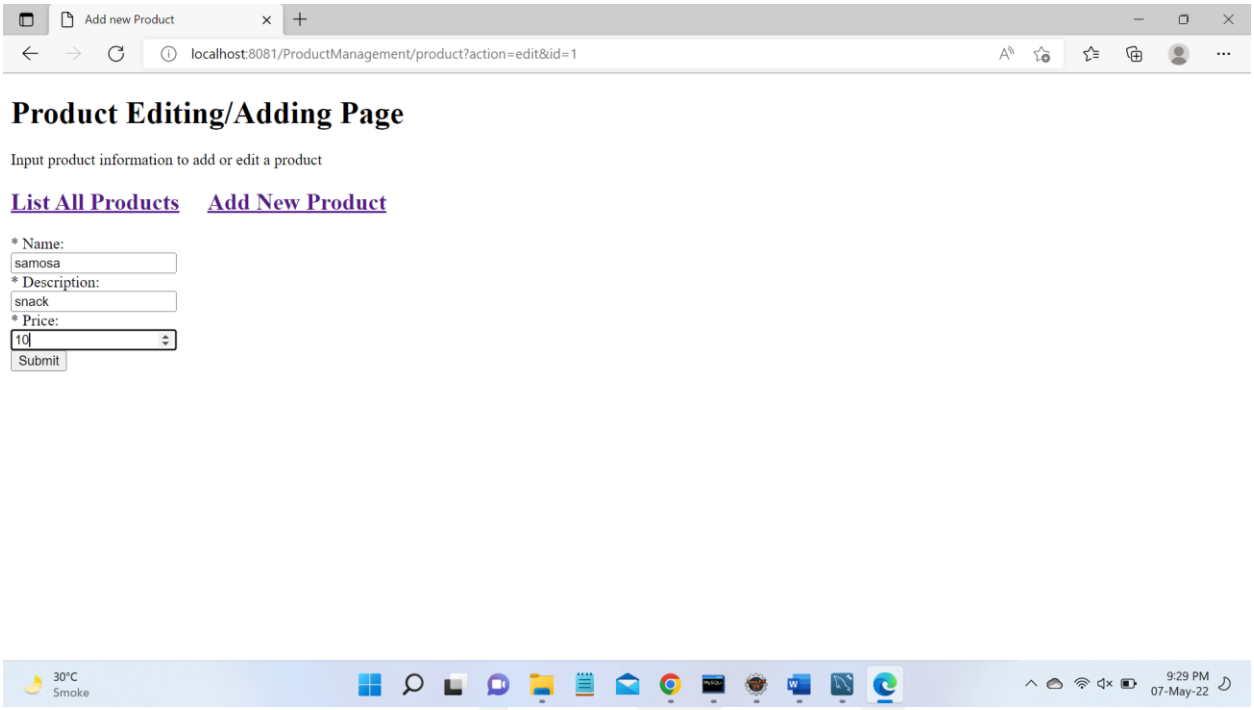
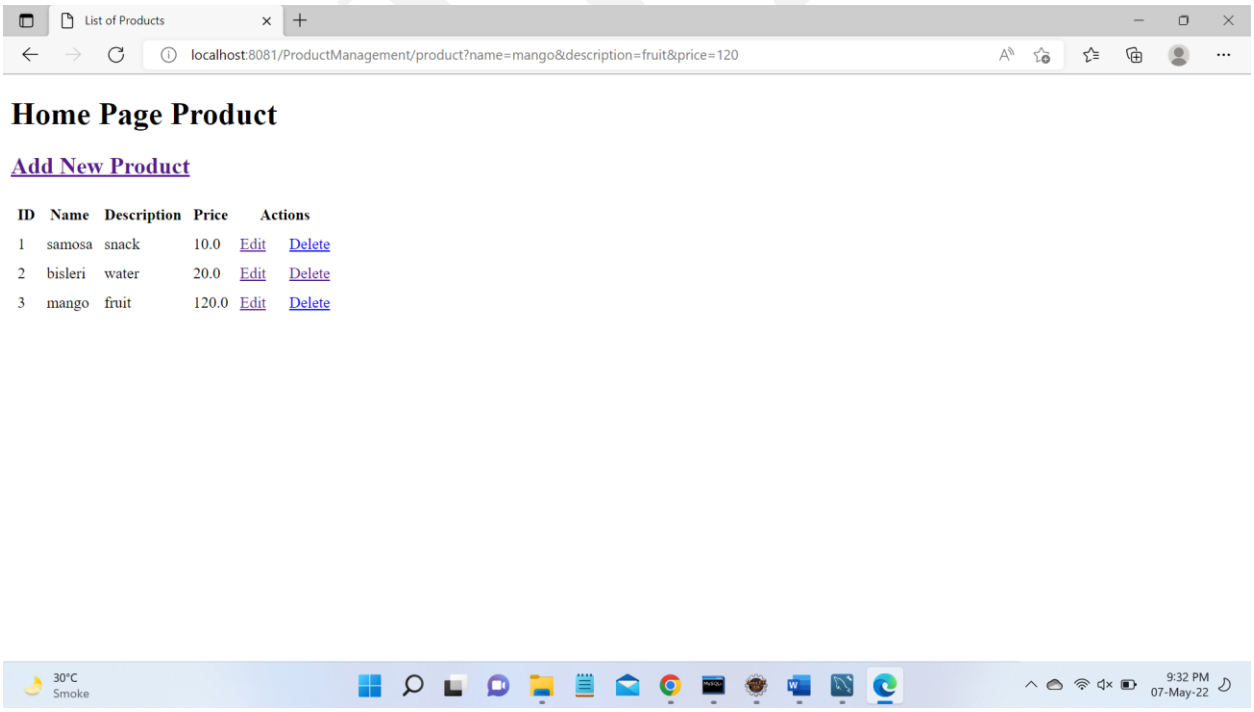
## Product editing page:




## Product displaying page



5. **Design a JAVA Servlet Program to Download a file and display it on the screen (A link has to be provided in HTML, when the link is clicked corresponding file has to be displayed on Screen).**

**Code:**

**FileDownloadServlet.java:**

```
package com.jcg.servlet;

import java.io.File;
import java.io.FileInputStream;
import java.io.IOException;
import java.io.OutputStream;

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

@WebServlet(description = "Download File From The Server", urlPatterns = {
"/downloadServlet" })
public class FileDownloadServlet extends HttpServlet {

	private static final long serialVersionUID = 1L;

	public static int BUFFER_SIZE = 1024 * 100;
	public static final String UPLOAD_DIR = "uploadedFiles";

	/***** This Method Is Called By The Servlet Container To Process A 'GET' Request
*****/
	public void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
		handleRequest(request, response);
	}

	public void handleRequest(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {

		/***** Get The Absolute Path Of The File To Be Downloaded *****/
		String fileName = request.getParameter("fileName"),
				applicationPath = getServletContext().getRealPath(""),
				downloadPath = applicationPath + File.separator +
UPLOAD_DIR,
				filePath = downloadPath + File.separator + fileName;
```

```
File file = new File(filePath);
OutputStream outStream = null;
FileInputStream inputStream = null;

if (file.exists()) {

	/**** Setting The Content Attributes For The Response Object ****/
	String mimeType = "application/octet-stream";
	response.setContentType(mimeType);

	/**** Setting The Headers For The Response Object ****/
	String headerKey = "Content-Disposition";
	String headerValue = String.format("attachment; filename=\"%s\"",
file.getName());
	response.setHeader(headerKey, headerValue);

	try {

		/**** Get The Output Stream Of The Response ****/
		outStream = response.getOutputStream();
		inputStream = new FileInputStream(file);
		byte[] buffer = new byte[BUFFER_SIZE];
		int bytesRead = -1;

		/**** Write Each Byte Of Data Read From The Input Stream
Write Each Byte Of Data  Read From The Input Stream Into The Output Stream ****/
		while ((bytesRead = inputStream.read(buffer)) != -1) {
			outStream.write(buffer, 0, bytesRead);
		}
	} catch(IOException ioExObj) {
		System.out.println("Exception While Performing The I/O
Operation?= " + ioExObj.getMessage());
	} finally {
		if (inputStream != null) {
			inputStream.close();
		}

		outStream.flush();
		if (outStream != null) {
			outStream.close();
		}
	}
} else {

	/***** Set Response Content Type *****/
```

```
                        response.setContentType("text/html");

                        /***** Print The Response *****/
                        response.getWriter().println("<h3>File "+ fileName +" Is Not Present
.....!</h3>");
                }
        }
}
```

**FileUploadServlet.java:**

```
package com.jcg.servlet;

import java.io.File;
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;

import javax.servlet.RequestDispatcher;
import javax.servlet.ServletException;
import javax.servlet.annotation.MultipartConfig;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
import javax.servlet.http.Part;

@WebServlet(description = "Upload File To The Server", urlPatterns = { "/fileUploadServlet" })
@MultipartConfig(fileSizeThreshold = 1024 * 1024 * 10, maxFileSize = 1024 * 1024 * 30,
maxRequestSize = 1024 * 1024 * 50)
public class FileUploadServlet extends HttpServlet {

        private static final long serialVersionUID = 1L;
        public static final String UPLOAD_DIR = "uploadedFiles";

        /***** This Method Is Called By The Servlet Container To Process A 'POST' Request
*****/
        public void doPost(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
                handleRequest(request, response);
        }

        public void handleRequest(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
```

```
		/***** Get The Absolute Path Of The Web Application *****/
		String applicationPath = getServletContext().getRealPath(""),
				uploadPath = applicationPath + File.separator + UPLOAD_DIR;

		File fileUploadDirectory = new File(uploadPath);
		if (!fileUploadDirectory.exists()) {
			fileUploadDirectory.mkdirs();
		}

		String fileName = "";
		UploadDetail details = null;
		List<UploadDetail> fileList = new ArrayList<UploadDetail>();

		for (Part part : request.getParts()) {
			fileName = extractFileName(part);
			details = new UploadDetail();
			details.setFileName(fileName);
			details.setFileSize(part.getSize() / 1024);
			try {
				part.write(uploadPath + File.separator + fileName);
				details.setUploadStatus("Success");
			} catch (IOException ioObj) {
				details.setUploadStatus("Failure : "+ ioObj.getMessage());
			}
			fileList.add(details);
		}

		request.setAttribute("uploadedFiles", fileList);
		RequestDispatcher dispatcher =
request.getRequestDispatcher("/fileuploadResponse.jsp");
		dispatcher.forward(request, response);
	}

	/***** Helper Method #1 - This Method Is Used To Read The File Names *****/
	private String extractFileName(Part part) {
		String fileName = "",
				contentDisposition = part.getHeader("content-disposition");
		String[] items = contentDisposition.split(";");
		for (String item : items) {
			if (item.trim().startsWith("filename")) {
				fileName = item.substring(item.indexOf("=") + 2, item.length() -
1);
			}
		}
		return fileName;
	}
```

```
}
```

**UploadDetail.java:**

```
package com.jcg.servlet;

import java.io.Serializable;

public class UploadDetail implements Serializable {

	private long fileSize;
	private String fileName, uploadStatus;

	private static final long serialVersionUID = 1L;

	public long getFileSize() {
		return fileSize;
	}

	public void setFileSize(long fileSize) {
		this.fileSize = fileSize;
	}

	public String getFileName() {
		return fileName;
	}

	public void setFileName(String fileName) {
		this.fileName = fileName;
	}

	public String getUploadStatus() {
		return uploadStatus;
	}

	public void setUploadStatus(String uploadStatus) {
		this.uploadStatus = uploadStatus;
	}
}
```

**UploadFilesServlet.java:**

```
package com.jcg.servlet;

import java.io.File;
import java.io.IOException;
import java.util.ArrayList;
import java.util.List;

import javax.servlet.RequestDispatcher;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@WebServlet(description = "List The Already Uploaded Files", urlPatterns = {
"/uploadedFilesServlet" })
public class UploadedFilesServlet extends HttpServlet {

	private static final long serialVersionUID = 1L;
	public static final String UPLOAD_DIR = "uploadedFiles";

	/***** This Method Is Called By The Servlet Container To Process A 'GET' Request
*****/
	public void doGet(HttpServletRequest request, HttpServletResponse response) throws
ServletException, IOException {
		handleRequest(request, response);
	}

	public void handleRequest(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {

		/***** Get The Absolute Path Of The Web Application *****/
		String applicationPath = getServletContext().getRealPath(""),
				uploadPath = applicationPath + File.separator + UPLOAD_DIR;

		File fileUploadDirectory = new File(uploadPath);
		if (!fileUploadDirectory.exists()) {
			fileUploadDirectory.mkdirs();
		}

		UploadDetail details = null;
		File[] allFiles = fileUploadDirectory.listFiles();
		List<UploadDetail> fileList = new ArrayList<UploadDetail>();

		for (File file : allFiles) {
```

```
                details = new UploadDetail();
                details.setFileName(file.getName());
                details.setFileSize(file.length() / 1024);
                fileList.add(details);
            }

            request.setAttribute("uploadedFiles", fileList);
            RequestDispatcher dispatcher = request.getRequestDispatcher("/allfiles.jsp");
            dispatcher.forward(request, response);
        }
}
```

**Fileupload.js:**

```
/***** jQuery To Prevent The Form Submission In Case No File Is Selected For Upload ****/
$(document).ready(function() {
        $("#fileUploadErr").hide();

        /***** Hide The Error Message When The Attachment Btn Is Clicked. ****/
        $('#fileAttachment').click(function(eObj) {
            $("#fileUploadErr").hide();
        });

        /***** Validating Whether The Attachment Is Uploaded Or Not. ****/
        $('#uploadBtn').click(function(eObj) {
            var file = $("#fileAttachment").map(function() {
                return $(this).val().trim() ? true : false;
            }).get();
            if (file.includes(true)) {
                /***** Do Nothing...! ****/
            } else {
                $("#fileUploadErr").css({'color':'red', 'font-weight': 'bold'}).show();
                eObj.preventDefault();
            }
        });
});
```

**Allfiles.jsp:**

```
<%@page import="java.util.List"%>
<%@page import="com.jcg.servlet.UploadDetail"%>
<%@page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-
8"%>
<!DOCTYPE html>
<html>
```

```
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Servlet File Upload/Download</title>


    </head>
    <body>
        <div class="panel">
            <h1>Uploaded Files</h1>
            <table class="bordered_table">
                <thead>
                    <tr align="center"><th>File Name</th><th>File Size</th><th>Action</th></tr>
                </thead>
                <tbody>
                    <% List<UploadDetail> uploadDetails =
(List<UploadDetail>)request.getAttribute("uploadedFiles");
                    if(uploadDetails != null && uploadDetails.size() > 0) {
                    for(int i=0; i<uploadDetails.size(); i++) {
                %>
                <tr>
                    <td align="center"><span id="fileName"><%=uploadDetails.get(i).getFileName()
%></span></td>
                    <td align="center"><span id="fileSize"><%=uploadDetails.get(i).getFileSize() %>
KB</span></td>
                    <td align="center"><span id="fileDownload"><a id="downloadLink"
class="hyperLink"
href="<%=request.getContextPath()%>/downloadServlet?fileName=<%=uploadDetails.get(i).ge
tFileName() %>">Download</a></span></td>
                </tr>
                <% }
                 } else { %>
                <tr>
                    <td colspan="3" align="center"><span id="noFiles">No Files
Uploaded.....!</span></td>
                </tr>
                <% } %>
                </tbody>
            </table>
            <div class="margin_top_15px">
                <a id="fileUpload" class="hyperLink"
href="<%=request.getContextPath()%>/fileupload.jsp">Back</a>
            </div>
        </div>
    </body>
</html>
```

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**Fileupload.jsp:**

```
<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
	<head>
	  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
	  <title>Servlet File Upload/Download</title>


	  <script type="text/javascript" src="resource/js/jquery-3.2.1.min.js"></script>
	  <script type="text/javascript" src="resource/js/fileupload.js"></script>
	</head>
	<body>
	  <div class="panel">
	    <h1>File Upload and Download</h1>

	    <form id="fileUploadForm" method="post" action="fileUploadServlet" enctype="multipart/form-data">
	      <div class="form_group">
	        <label>Upload File</label><span id="colon">: </span><input id="fileAttachment" type="file" name="fileUpload" multiple="multiple" />
	        <span id="fileUploadErr">Please Upload A File!</span>
	      </div>
	      <br>
	      <button id="uploadBtn" type="submit" class="btn btn_primary">Upload</button>
	    </form>
	  </div>

	  <!-- List All Uploaded Files -->
	  <br>
	  <div class="panel">
	    <a id="allFiles" class="hyperLink" href="<%=request.getContextPath()%>/uploadedFilesServlet">List all uploaded files</a>
	  </div>
	</body>
</html>
```

**fileuploadResponse.jsp:**

```
<%@page import="java.util.List"%>
<%@page import="com.jcg.servlet.UploadDetail"%>
<%@page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
	<head>
		<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
		<title>Servlet File Upload/Download</title>

		<!-- <link rel="stylesheet" href="resource/css/main.css" /> -->
	</head>
	<body>
		<div class="panel">
			<h1>File Upload Status</h1>
		  <table class="bordered_table">
			<thead>
				<tr align="center"><th>File Name</th><th>File Size</th><th>Upload Status</th><th>Action</th></tr>
			</thead>
			<tbody>
				<% List<UploadDetail> uploadDetails = (List<UploadDetail>)request.getAttribute("uploadedFiles");
					for(int i=0; i<uploadDetails.size(); i++) {
				%>
				<tr>
					<td align="center"><span id="fileName"><%=uploadDetails.get(i).getFileName() %></span></td>
		<td align="center"><span id="fileSize"><%=uploadDetails.get(i).getFileSize() %> KB</span></td>
					<td align="center"><span id="fileuploadStatus"><%=uploadDetails.get(i).getUploadStatus() %></span></td>
					<td align="center"><span id="fileDownload"><a id="downloadLink" class="hyperLink" href="<%=request.getContextPath()%>/downloadServlet?fileName=<%=uploadDetails.get(i).getFileName() %>">Download</a></span></td>
				</tr>
				<% } %>
			</tbody>
		  </table>
		  <div class="margin_top_15px">
			<a id="fileUpload" class="hyperLink" href="<%=request.getContextPath()%>/fileupload.jsp">Back</a>
		  </div>
		</div>
```

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

**Web.xml:**

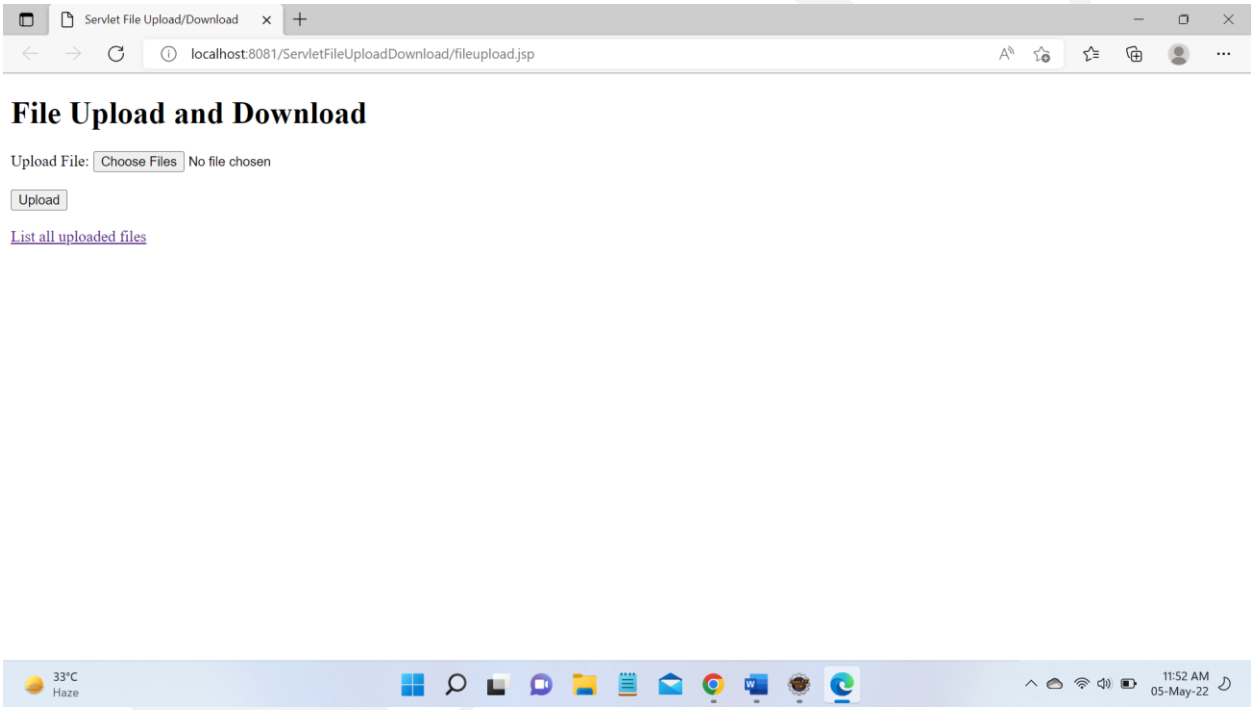
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd" version="3.0">
  <display-name>Servlet File Upload/Download</display-name>
  <welcome-file-list>
    <welcome-file>fileupload.jsp</welcome-file>
  </welcome-file-list>
</web-app>
```

**Pom.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/maven-
v4_0_0.xsd">
    <modelVersion>4.0.0</modelVersion>
    <groupId>ServletFileUploadDownload</groupId>
    <artifactId>ServletFileUploadDownload</artifactId>
    <packaging>war</packaging>
    <version>0.0.1-SNAPSHOT</version>
    <name>ServletFileUploadDownload Maven Webapp</name>
    <url>http://maven.apache.org</url>
    <dependencies>
        <!-- Servlet API Dependency -->
        <dependency>
            <groupId>javax.servlet</groupId>
            <artifactId>javax.servlet-api</artifactId>
            <version>3.1.0</version>
        </dependency>
        <dependency>
            <groupId>javax.servlet.jsp</groupId>
            <artifactId>jsp-api</artifactId>
            <version>2.1</version>
        </dependency>
    </dependencies>
    <build>
        <plugins>
```

```
                <plugin>
                    <groupId>org.apache.maven.plugins</groupId>
                    <artifactId>maven-war-plugin</artifactId>
                    <version>3.3.1</version>
                </plugin>
            </plugins>
            <finalName>${project.artifactId}</finalName>
        </build>
</project>
```

**Output:**



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## File Upload and Download

Upload File: Choose Files Receipt Format.pdf

Upload

List all uploaded files



## File Upload Status

| File Name | File Size | Upload Status | Action |
|---|---|---|---|
| Receipt Format.pdf | 102 KB | Success | Download |

Back

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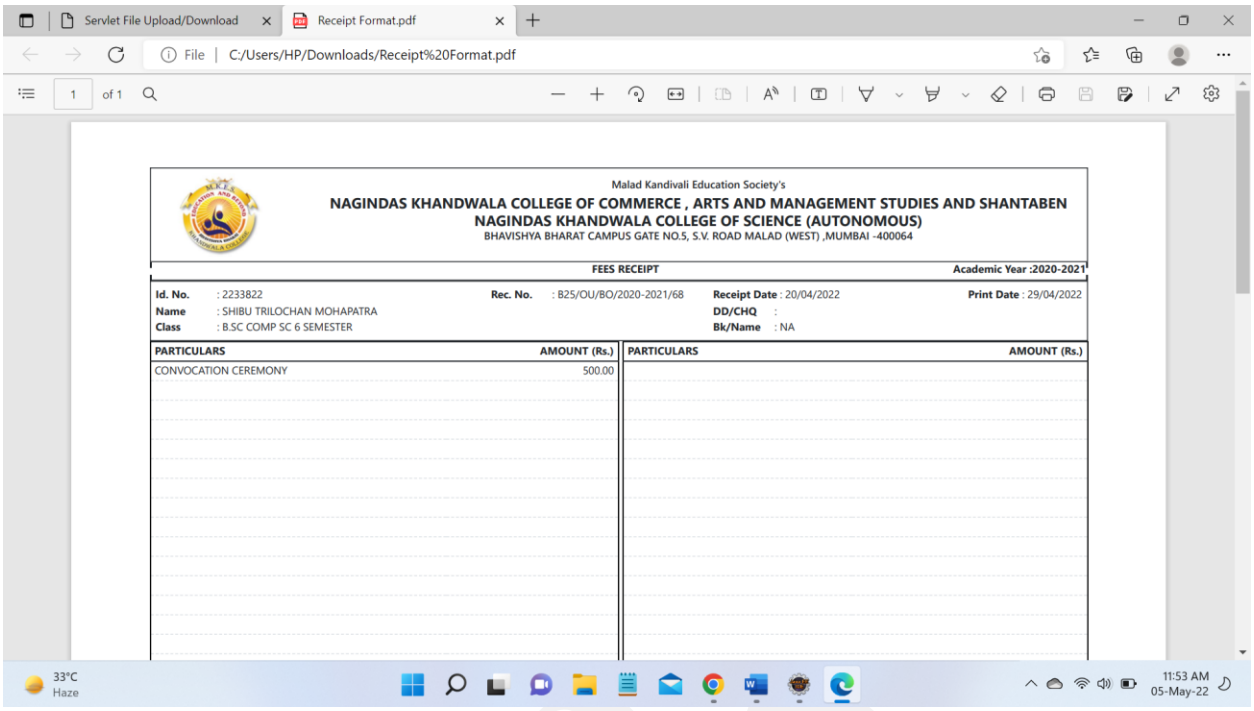

Malad Kandivali Education Society's

**NAGINDAS KHANDWALA COLLEGE OF COMMERCE , ARTS AND MANAGEMENT STUDIES AND SHANTABEN NAGINDAS KHANDWALA COLLEGE OF SCIENCE (AUTONOMOUS)**

BHAVISHYA BHARAT CAMPUS GATE NO.5, S.V. ROAD MALAD (WEST) ,MUMBAI -400064

**FEES RECEIPT** **Academic Year :2020-2021**

| | | | | | |
|---|---|---|---|---|---|
| **Id. No.** | : 2233822 | **Rec. No.** | : B25/OU/BO/2020-2021/68 | **Receipt Date** : 20/04/2022 | **Print Date** : 29/04/2022 |
| **Name** | : SHIBU TRILOCHAN MOHAPATRA | | | **DD/CHQ** : | |
| **Class** | : B.SC COMP SC 6 SEMESTER | | | **Bk/Name** : NA | |

| PARTICULARS | AMOUNT (Rs.) | PARTICULARS | AMOUNT (Rs.) |
|---|---|---|---|
| CONVOCATION CEREMONY | 500.00 | | |

**6.**

**a) Design a JAVA Servlet Program to implement Request Dispatcher object using include() and forward() methods.**

**Code:**

**Login.java:**

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


public class Login extends HttpServlet {

public void doPost(HttpServletRequest request, HttpServletResponse response)
      throws ServletException, IOException {

   response.setContentType("text/html");
   PrintWriter out = response.getWriter();

   String n=request.getParameter("userName");
   String p=request.getParameter("userPass");

   if(p.equals("servlet")){
      RequestDispatcher rd=request.getRequestDispatcher("servlet2");
      rd.forward(request, response);
   }
   else{
      out.print("Sorry UserName or Password Error!");
      RequestDispatcher rd=request.getRequestDispatcher("/index.html");
      rd.include(request, response);

      }
   }

}
```

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**WelcomeServlet.java:**

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

public class WelcomeServlet extends HttpServlet {

   public void doPost(HttpServletRequest request, HttpServletResponse response)
      throws ServletException, IOException {

   response.setContentType("text/html");
   PrintWriter out = response.getWriter();

   String n=request.getParameter("userName");
   out.print("Welcome "+n);
   }

}
```

**Index.html:**

```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Login</title>
</head>
<body>
<form action="servlet1" method="post">
Name:<input type="text" name="userName"/><br/>
Password:<input type="password" name="userPass"/><br/>
<input type="submit" value="login"/>

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

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**Web.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_4_0.xsd" id="WebApp_ID" version="4.0">
  <display-name>RequestDispatcher</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.jsp</welcome-file>
    <welcome-file>default.htm</welcome-file>
  </welcome-file-list>

  <servlet>
    <servlet-name>Login</servlet-name>
    <servlet-class>Login</servlet-class>
  </servlet>
  <servlet>
    <servlet-name>WelcomeServlet</servlet-name>
    <servlet-class>WelcomeServlet</servlet-class>
  </servlet>

  <servlet-mapping>
    <servlet-name>Login</servlet-name>
    <url-pattern>/servlet1</url-pattern>
  </servlet-mapping>
  <servlet-mapping>
    <servlet-name>WelcomeServlet</servlet-name>
    <url-pattern>/servlet2</url-pattern>
  </servlet-mapping>

  <welcome-file-list>
   <welcome-file>index.html</welcome-file>
  </welcome-file-list>
</web-app>
```

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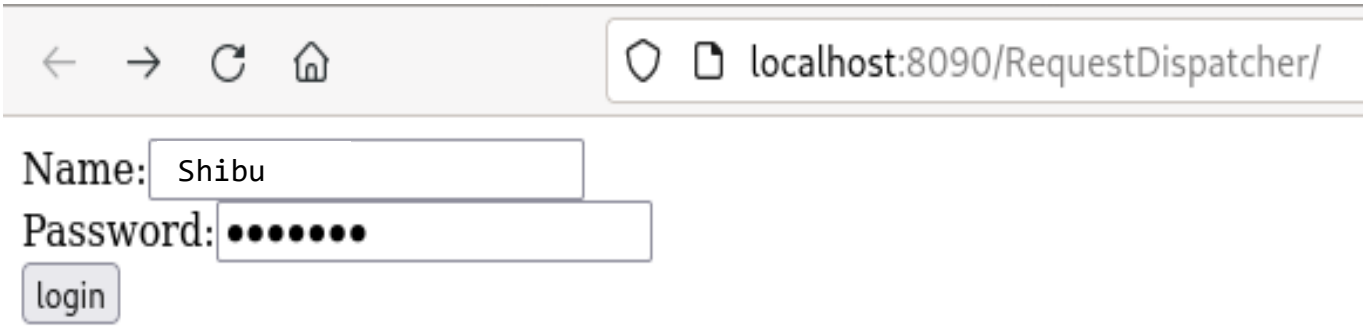
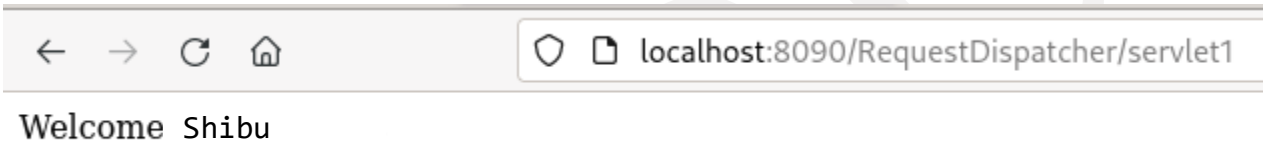
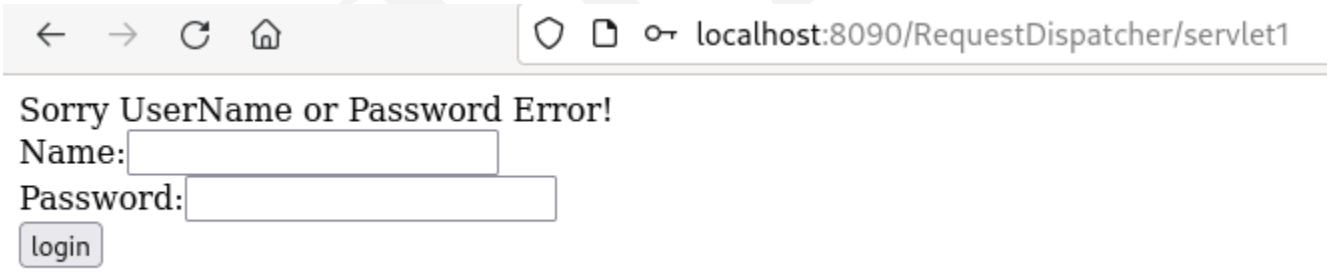
**Output:**




**With correct login details –**




**With incorrect login details –**



**b) Implement a JAVA Servlet Program to implement sessions using HTTP Session Interface.**

**Code:**

**FirstServlet.java:**

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

public class FirstServlet extends HttpServlet {
        public void doGet(HttpServletRequest request, HttpServletResponse response) {
                try {
                        response.setContentType("text/html");
                        PrintWriter out = response.getWriter();
                        String n = request.getParameter("userName");
                        out.print("Welcome " + n);
                        HttpSession session = request.getSession();
                        session.setAttribute("uname", n);
                        out.print("<a href='servlet2'>visit</a>");
                        out.close();
                } catch (Exception e) {
                        System.out.println(e);
                }
        }
}
```

**SecondServlet.java:**

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

public class SecondServlet extends HttpServlet {

public void doGet(HttpServletRequest request, HttpServletResponse response){
      try{

         response.setContentType("text/html");
         PrintWriter out = response.getWriter();
         HttpSession session=request.getSession(false);
```

```
        String n=(String)session.getAttribute("uname");
        out.print("Hello "+n);
        out.close();
            }catch(Exception e){System.out.println(e);}
    }
}
```

**Index.html:**

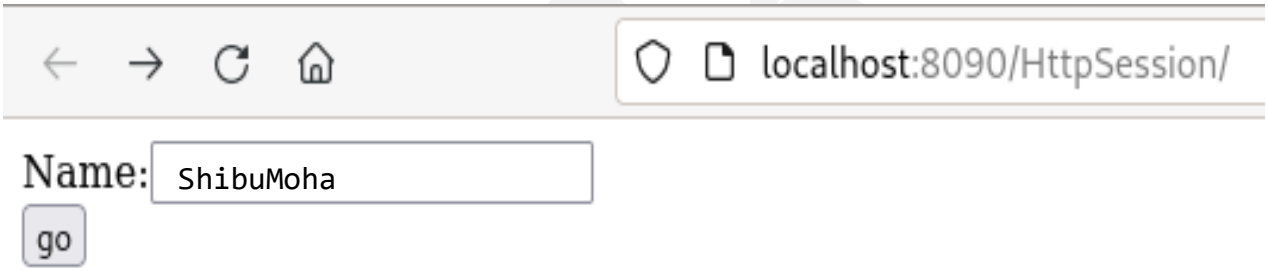
```
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>login</title>
</head>
<body>
<form action="servlet1">
Name:<input type="text" name="userName"/><br/>
<input type="submit" value="go"/>
</form>
</body>
</html>
```

**Web.xml:**

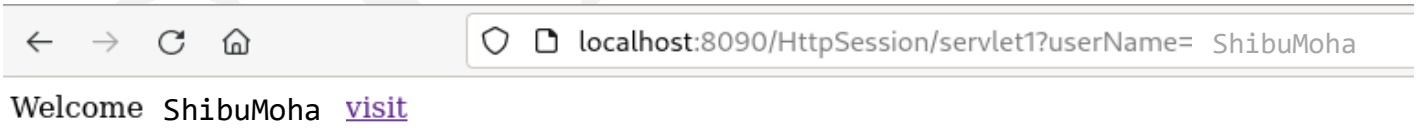
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://xmlns.jcp.org/xml/ns/javaee"
xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd" id="WebApp_ID" version="4.0">
  <display-name>HttpSession</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.jsp</welcome-file>
    <welcome-file>default.htm</welcome-file>
  </welcome-file-list>
                <servlet>
                <servlet-name>s1</servlet-name>
                <servlet-class>FirstServlet</servlet-class>
                </servlet>
```

```
        <servlet-mapping>
        <servlet-name>s1</servlet-name>
        <url-pattern>/servlet1</url-pattern>
        </servlet-mapping>

        <servlet>
        <servlet-name>s2</servlet-name>
        <servlet-class>SecondServlet</servlet-class>
        </servlet>

        <servlet-mapping>
        <servlet-name>s2</servlet-name>
        <url-pattern>/servlet2</url-pattern>
        </servlet-mapping>
</web-app>
```

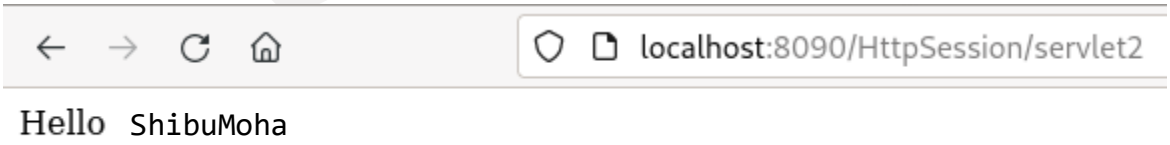
**Output:**




**Servlet1 –**




**Servlet2 –**



Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

**JSP**

1. **Develop dynamic web application to manage user (userId, name, dob, address) details using JSP. This app must have following pages**
   a. **Home page**
   b. **User adding page**
   c. **User editing page**
   d. **User displaying page**

**Code:**
**User.java:**

```
package com.javatpoint.bean;

import java.sql.Date;

public class User {
private int id;
private String name,password,email,sex,address;
private Date dob;
public int getId() {
	return id;
}
public void setId(int id) {
	this.id = id;
}
public String getName() {
	return name;
}
public void setName(String name) {
	this.name = name;
}
public String getPassword() {
	return password;
}
public void setPassword(String password) {
	this.password = password;
}
public String getEmail() {
	return email;
}
public void setEmail(String email) {
	this.email = email;
}
public String getSex() {
```

```
        return sex;
}
public void setSex(String sex) {
        this.sex = sex;
}
public Date getDob() {
        return dob;
}
public void setDob(Date dob) {
        this.dob = dob;
}
public String getAddress() {
        return address;
}
public void setAddress(String address) {
        this.address = address;
}
}
```

**UserDao:**

```
package com.javatpoint.dao;
import java.sql.*;
import java.util.ArrayList;
import java.util.List;


import com.javatpoint.bean.User;
public class UserDao {
public static Connection getConnection(){
        Connection con=null;
        try{
                Class.forName("com.mysql.jdbc.Driver");

        con=DriverManager.getConnection("jdbc:mysql://localhost:3306/test","root","shibu@nin
ja");
        }catch(Exception e){System.out.println(e);}
        return con;
}
public static int save(User u){
        int status=0;
        try{
                Connection con=getConnection();
                PreparedStatement ps=con.prepareStatement("insert into
register(name,password,email,sex,dob,address) values(?,?,?,?,?,?)");
                ps.setString(1,u.getName());
                ps.setString(2,u.getPassword());
```

```
                ps.setString(3,u.getEmail());
                ps.setString(4,u.getSex());
                ps.setDate(5,u.getDob());
                ps.setString(6,u.getAddress());
                status=ps.executeUpdate();
        }catch(Exception e){System.out.println(e);}
        return status;
}
public static int update(User u){
        int status=0;
        try{
                Connection con=getConnection();
                PreparedStatement ps=con.prepareStatement("update register set
name=?,password=?,email=?,sex=?,dob=?,address=? where id=?");
                ps.setString(1,u.getName());
                ps.setString(2,u.getPassword());
                ps.setString(3,u.getEmail());
                ps.setString(4,u.getSex());
                ps.setDate(5,u.getDob());
                ps.setString(6,u.getAddress());
                ps.setInt(7,u.getId());
                status=ps.executeUpdate();
        }catch(Exception e){System.out.println(e);}
        return status;
}
public static int delete(User u){
        int status=0;
        try{
                Connection con=getConnection();
                PreparedStatement ps=con.prepareStatement("delete from register where id=?");
                ps.setInt(1,u.getId());
                status=ps.executeUpdate();
        }catch(Exception e){System.out.println(e);}

        return status;
}
public static List<User> getAllRecords(){
        List<User> list=new ArrayList<User>();

        try{
                Connection con=getConnection();
                PreparedStatement ps=con.prepareStatement("select * from register");
                ResultSet rs=ps.executeQuery();
                while(rs.next()){
                        User u=new User();
                        u.setId(rs.getInt("id"));
```

```
                u.setName(rs.getString("name"));
                u.setPassword(rs.getString("password"));
                u.setEmail(rs.getString("email"));
                u.setSex(rs.getString("sex"));
                u.setDob(rs.getDate("dob"));
                u.setAddress(rs.getString("address"));
                list.add(u);
            }
        }catch(Exception e){System.out.println(e);}
        return list;
}
public static User getRecordById(int id){
        User u=null;
        try{
            Connection con=getConnection();
            PreparedStatement ps=con.prepareStatement("select * from register where id=?");
            ps.setInt(1,id);
            ResultSet rs=ps.executeQuery();
            while(rs.next()){
                u=new User();
                u.setId(rs.getInt("id"));
                u.setName(rs.getString("name"));
                u.setPassword(rs.getString("password"));
                u.setEmail(rs.getString("email"));
                u.setSex(rs.getString("sex"));
                u.setDob(rs.getDate("dob"));
                u.setAddress(rs.getString("address"));
            }
        }catch(Exception e){System.out.println(e);}
        return u;
}
}
```

**Adduser.jsp:**

```
<%@page import="com.javatpoint.dao.UserDao"%>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<%@page import="com.javatpoint.bean.User"%>
<jsp:useBean id="u" class="com.javatpoint.bean.User"></jsp:useBean>
<jsp:setProperty property="*" name="u"/>

<%
int i=UserDao.save(u);
if(i>0){
response.sendRedirect("adduser-success.jsp");
}else{
```

```
response.sendRedirect("adduser-error.jsp");
}
%>
```

**Adduser-error.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>Add User Success</title>
</head>
<body>

<p>Sorry, an error occured!</p>
<jsp:include page="userform.html"></jsp:include>

</body>
</html>
```

**Adduserform.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>Adding User Page</title>
</head>
<body>

<jsp:include page="userform.html"></jsp:include>

</body>
</html>
```

**Adduser-success.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>Add User Success</title>
```

```
</head>
<body>

<p>Record successfully saved!</p>
<jsp:include page="userform.html"></jsp:include>

</body>
</html>
```

**Deleteuser.jsp:**

```
<%@page import="com.javatpoint.dao.UserDao"%>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<%@page import="com.javatpoint.bean.User"%>
<jsp:useBean id="u" class="com.javatpoint.bean.User"></jsp:useBean>
<jsp:setProperty property="*" name="u"/>

<%
UserDao.delete(u);
response.sendRedirect("viewusers.jsp");
%>
```

**Editform.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>Edit Form</title>
</head>
<body>
<%@page import="com.javatpoint.dao.UserDao,com.javatpoint.bean.User"%>

<%
String id=request.getParameter("id");
User u=UserDao.getRecordById(Integer.parseInt(id));
%>

<h1>User Editing Page</h1>
<form action="edituser.jsp" method="post">
<input type="hidden" name="id" value="<%=u.getId() %>"/>
<table>
<tr><td>Name:</td><td><input type="text" name="name" value="<%=
u.getName()%>"/></td></tr>
```

```
<tr><td>Password:</td><td><input type="password" name="password" value="<%=
u.getPassword()%>"/></td></tr>
<tr><td>Email:</td><td><input type="email" name="email" value="<%=
u.getEmail()%>"/></td></tr>
<tr><td>Sex:</td><td><input type="radio" name="sex" value="male"/>Male <input
type="radio" name="sex" value="female"/>Female </td></tr>
<tr><td>Dob:</td><td><input type="date">
<tr><td>Address:</td><td>
<select name="address">
<option>India</option>
<option>UK</option>
<option>USA</option>
<option>Canada</option>
<option>Other</option>
</select>
</td></tr>
<tr><td colspan="2"><input type="submit" value="Edit User"/></td></tr>
</table>
</form>

</body>
</html>
```

**Edituser.jsp:**

```
<%@page import="com.javatpoint.dao.UserDao"%>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<%@page import="com.javatpoint.bean.User"%>
<jsp:useBean id="u" class="com.javatpoint.bean.User"></jsp:useBean>
<jsp:setProperty property="*" name="u"/>

<%
int i=UserDao.update(u);
response.sendRedirect("viewusers.jsp");
%>
```

**Index.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>
<h2>User details Home Page</h2>
<a href="adduserform.jsp">User Adding Page</a>
<br><br>
<a href="viewusers.jsp">User Display Page</a>

</body>
</html>
```

**Userform.html:**

```
<!DOCTYPE html>
<html>

<a href="viewusers.jsp">View All Records</a><br/>

<h1>Adding New User</h1>
<form action="adduser.jsp" method="post">
<table>
<tr><td>Name:</td><td><input type="text" name="name"/></td></tr>
<tr><td>Password:</td><td><input type="password" name="password"/></td></tr>
<tr><td>Email:</td><td><input type="email" name="email"/></td></tr>
<tr><td>Sex:</td><td><input type="radio" name="sex" value="male"/>Male <input
type="radio" name="sex" value="female"/>Female </td></tr>
<tr><td>Dob:</td><td><input type="date">
<tr><td>Address:</td><td>
<select name="address">
<option>India</option>
<option>UK</option>
<option>USA</option>
<option>Canada</option>
<option>Other</option>
</select>
</td></tr>
<tr><td colspan="2"><input type="submit" value="Add User"/></td></tr>
</table>
</form>
</html>
```

**Viewusers.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>View Users</title>
</head>
<body>

<%@page import="com.javatpoint.dao.UserDao,com.javatpoint.bean.*,java.util.*"%>
<%@ taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>

<h1>User Displaying Page</h1>

<%
List<User> list=UserDao.getAllRecords();
request.setAttribute("list",list);
%>

<table border="1" width="90%">
<tr><th>Id</th><th>Name</th><th>Password</th><th>Email</th><th>Sex</th><th>Dob</th>
<th>Address</th><th>Edit</th><th>Delete</th></tr>
<c:forEach items="${list}" var="u">
        <tr><td>${u.getId()}</td>
        <td>${u.getName()}</td>
        <td>${u.getPassword()}</td>
        <td>${u.getEmail()}</td>
        <td>${u.getSex()}</td>
        <td>${u.getDob()}</td>
        <td>${u.getAddress()}</td>
        <td><a href="editform.jsp?id=${u.getId()}">Edit</a></td>
        <td><a href="deleteuser.jsp?id=${u.getId()}">Delete</a></td></tr>
</c:forEach>
</table>
<br/><a href="adduserform.jsp">Add New User</a>

</body>
</html>
```

**Pom.xml:**

```
<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 https://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>JSPCrud</groupId>
  <artifactId>JSPCrud</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <packaging>war</packaging>
  <dependencies>
```

```
            <dependency>
                <groupId>javax.servlet</groupId>
                <artifactId>javax.servlet-api</artifactId>
                <version>3.1.0</version>
                <scope>provided</scope>
            </dependency>
            <dependency>
                <groupId>javax.servlet.jsp</groupId>
                <artifactId>javax.servlet.jsp-api</artifactId>
                <version>2.3.3</version>
                <scope>provided</scope>
            </dependency>
            <dependency>
                <groupId>javax.servlet</groupId>
                <artifactId>jstl</artifactId>
                <version>1.2</version>
            </dependency>
            <dependency>
                <groupId>mysql</groupId>
                <artifactId>mysql-connector-java</artifactId>
                <version>8.0.20</version>
            </dependency>

        </dependencies>
  <build>
    <plugins>
      <plugin>
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.8.1</version>
        <configuration>
          <release>17</release>
        </configuration>
      </plugin>
      <plugin>
        <artifactId>maven-war-plugin</artifactId>
        <version>3.2.3</version>
      </plugin>
    </plugins>
  </build>
</project>
```

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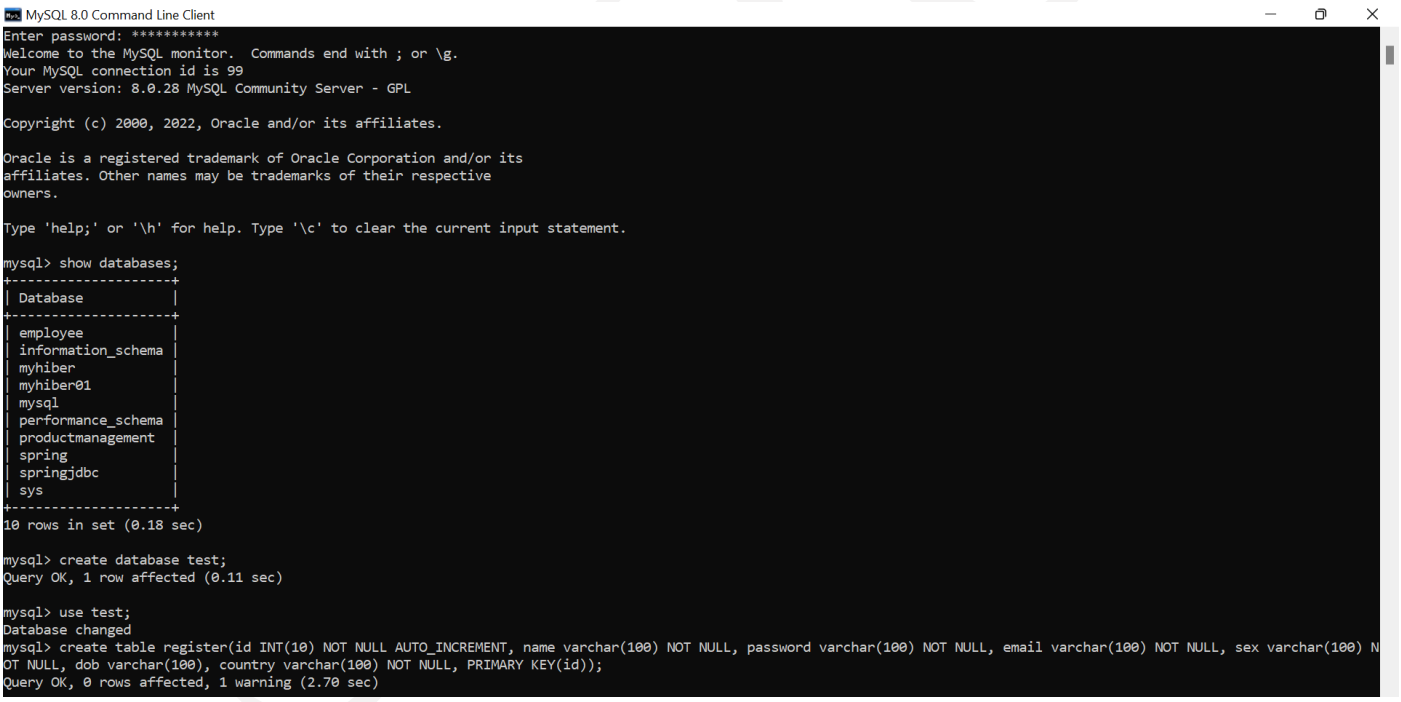
**MySQL:**

- Create database test;
- Use test;
- Create table register(id INT(10) NOT NULL AUTO_INCREMENT, name varchar(100) NOT NULL, password varchar(100) NOT NULL, email varchar(100) NOT NULL, sex varchar(100) NOT NULL, dob varchar(100), country varchar(100) NOT NULL,PRIMARY KEY(id));
- desc register;
- alter table register MODIFY column dob DATE;
- select * from register;



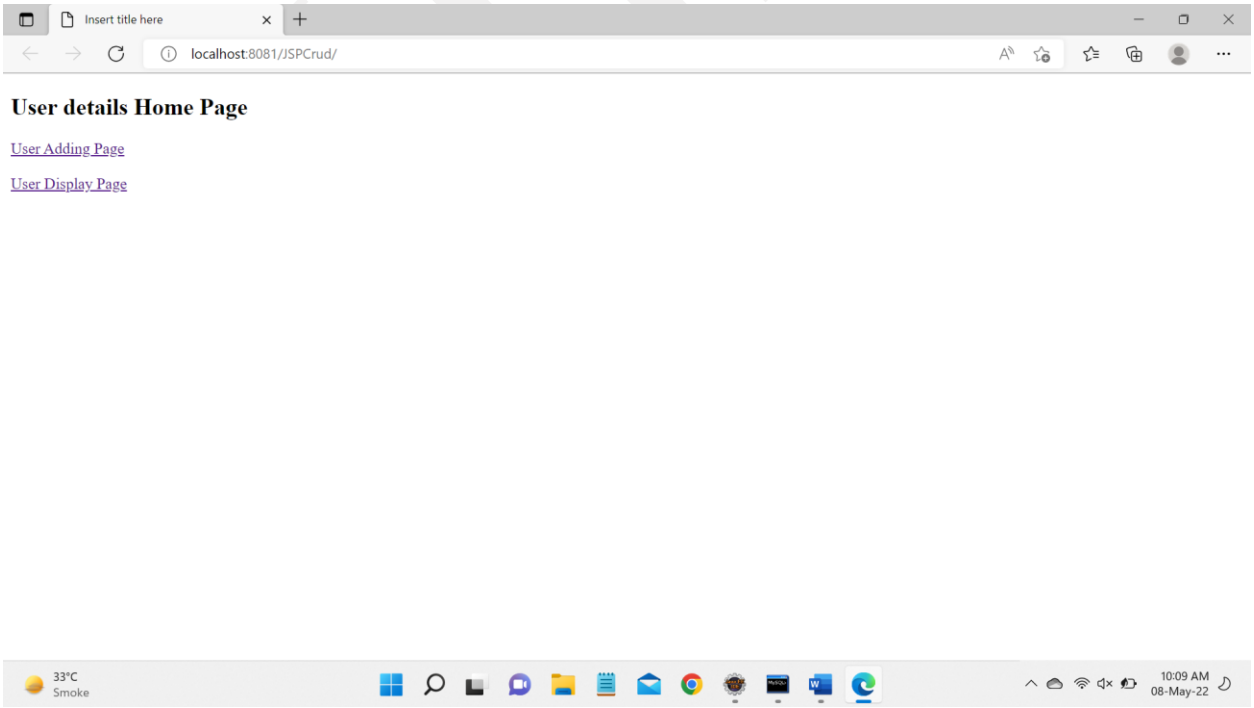
Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

MySQL 8.0 Command Line Client

```
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc register;
+----------+--------------+------+-----+---------+----------------+
| Field    | Type         | Null | Key | Default | Extra          |
+----------+--------------+------+-----+---------+----------------+
| id       | int          | NO   | PRI | NULL    | auto_increment |
| name     | varchar(100) | NO   |     | NULL    |                |
| password | varchar(100) | NO   |     | NULL    |                |
| email    | varchar(100) | NO   |     | NULL    |                |
| sex      | varchar(100) | NO   |     | NULL    |                |
| dob      | datetime     | YES  |     | NULL    |                |
| address  | varchar(100) | NO   |     | NULL    |                |
+----------+--------------+------+-----+---------+----------------+
7 rows in set (0.22 sec)

mysql> alter table register MODIFY column dob DATE;
Query OK, 2 rows affected (3.15 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from register;
+----+------+----------+----------------+--------+------+---------+
| id | name | password | email          | sex    | dob  | address |
+----+------+----------+----------------+--------+------+---------+
|  1 | test | test     | test@gmail.com | female | NULL | India   |
|  2 | asd  | asd      | asd@gmail.com  | male   | NULL | USA     |
+----+------+----------+----------------+--------+------+---------+
2 rows in set (0.00 sec)

mysql>
```

**Output:**

**Home page:**



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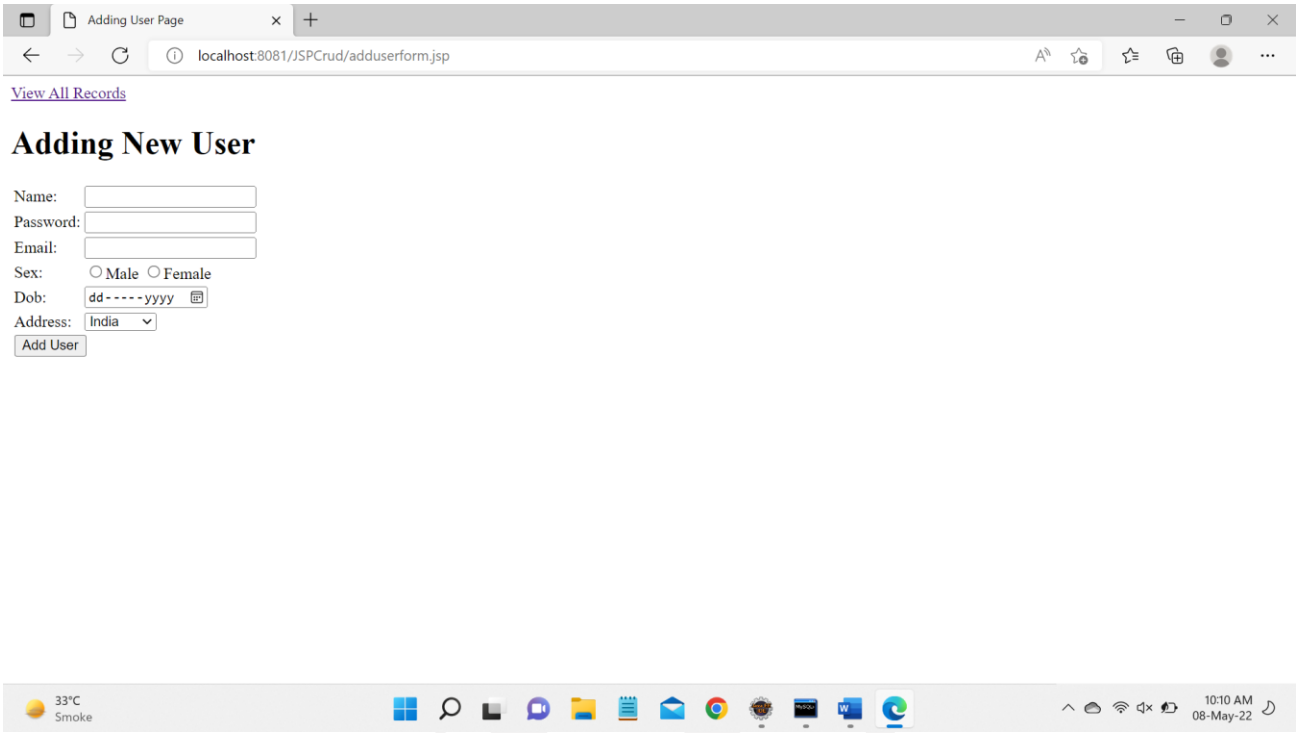
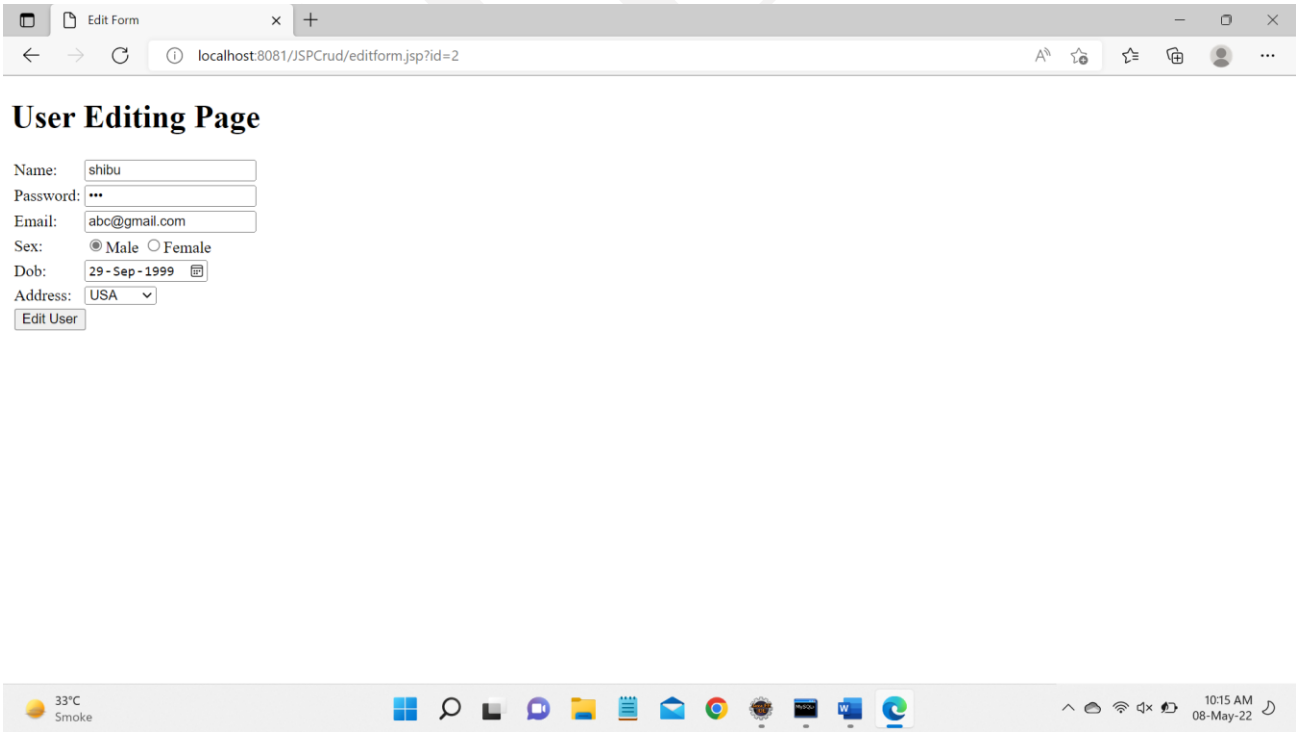
## User adding page:




## User editing page:



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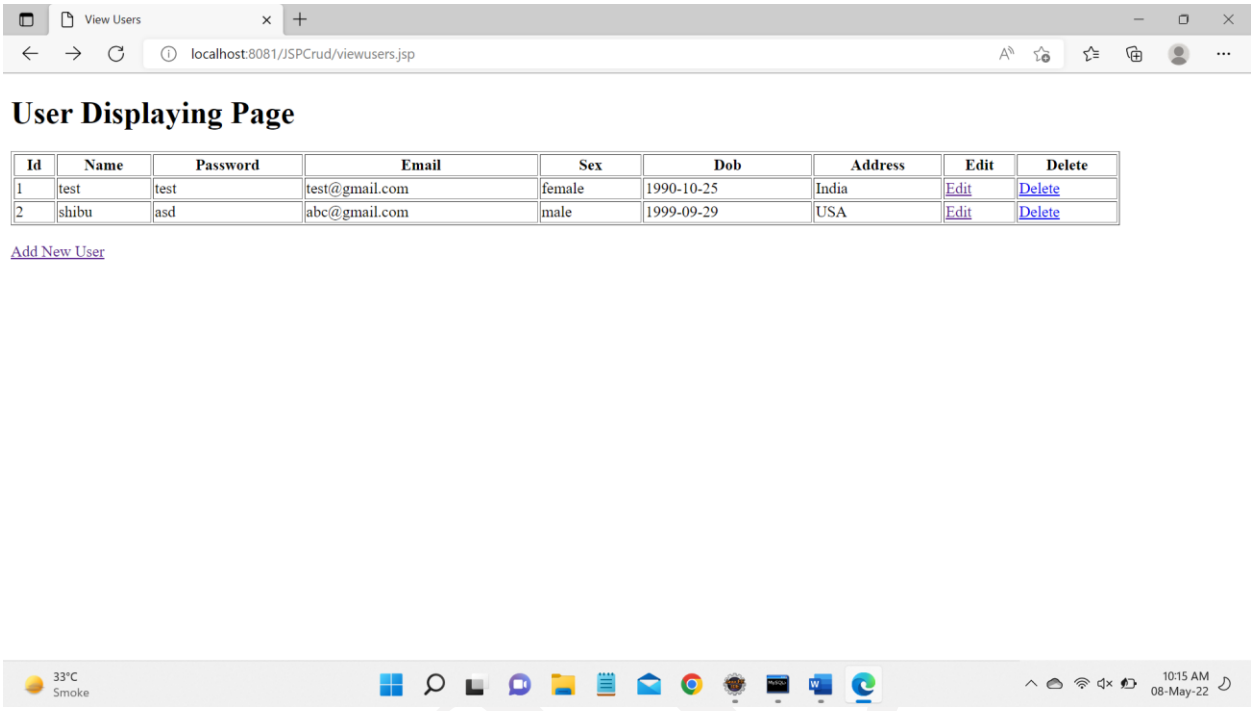
**User displaying page:**



Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

2. **Write JSP program to implement custom tag with name <product>, which display product (prodId, name, category, price) details.**

**Code:**

**ForwardTag.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Forward Action Example</title>
</head>
<body>

<body>
<!-- > is square.jsp -->
<!-- < is OrderForm.jsp -->

<%if(Math.random()<0.5){ %>
<jsp:forward page="square.jsp"></jsp:forward>

<%} else{ %>
<jsp:forward page="OrderForm.jsp"></jsp:forward>
<%}
%>

</body>
</html>
```

**Square.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>IPower of 2 for integers in the range0-10</title>
</head>
<body>

<center></center>
```

```
<table border="2" align="center">
<th>Exponent</th>
<th>2^Exponent</th>

<% for(int i=0;i<=10;i++)
{ // start the loop
%>

<tr>
<td><%=i %></td>
<td><%=Math.pow(2,i) %></td>
</tr>
<%}//end of loop %>
</table>
</center>

</body>
</html>
```

**OrderForm.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
   pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Sample Order Form</title>
</head>
<body>

<h1 align="center">A Sample Order Form</h1>

<%! int prodid[]={1,2,3,4,5};
String name []={"Pen", "Pencil", "Book", "Mouse", "Keyboard"} ;
String category[]={"stationary","stationary","stationary","computer","computer"};
double price[]={10.10, 5.5, 99.99, 200.00, 600.00};
int quantity[]={10,5,8,5,2};
%>

<table align="center" bgcolour="Blue" border="1" width="50%">

<tr><td>ProdId</td>
<td>Name</td>
<td>Category</td>
```

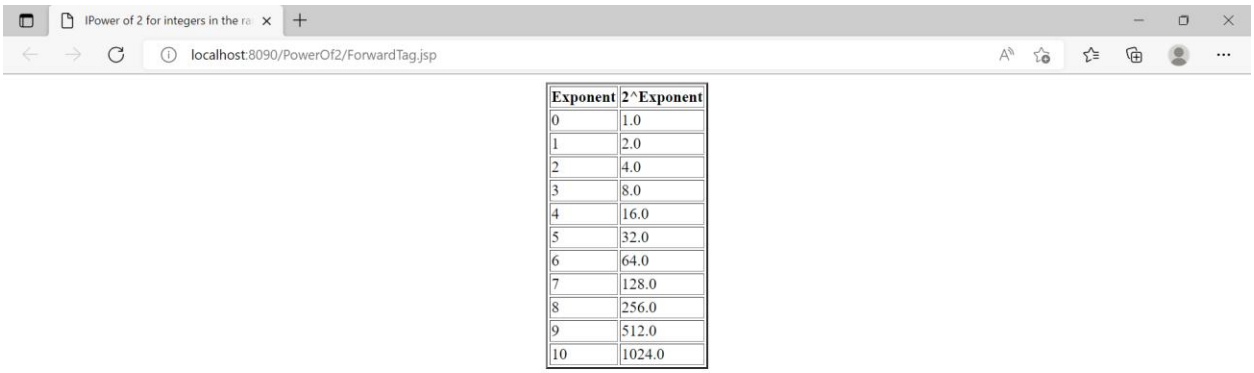
```
<td>Price</td>
<td>Quantity</td>
<td>Total Price</td>
</tr>

<%for(int i=0;i<5;i++){ %>
<tr><td><%=prodid[i] %></td>
<td><%=name[i] %></td>
<td><%=category[i] %></td>
<td><%=price[i] %></td>
<td><%=quantity[i] %></td>
<td><%=price[i] * quantity[i] %></td>

<%}//end for loop %>

</table>

</body>
</html>
```

**Web.xml:**

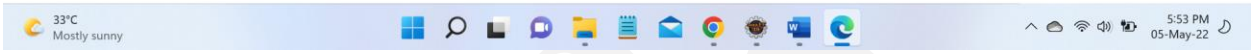
```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd" id="WebApp_ID" version="3.0">
  <display-name>PowerOf2</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.jsp</welcome-file>
    <welcome-file>default.htm</welcome-file>
  </welcome-file-list>
</web-app>
```

**Output:**

Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**




| Exponent | 2^Exponent |
|---|---|
| 0 | 1.0 |
| 1 | 2.0 |
| 2 | 4.0 |
| 3 | 8.0 |
| 4 | 16.0 |
| 5 | 32.0 |
| 6 | 64.0 |
| 7 | 128.0 |
| 8 | 256.0 |
| 9 | 512.0 |
| 10 | 1024.0 |





## A Sample Order Form

| ProdId | Name | Category | Price | Quantity | Total Price |
|---|---|---|---|---|---|
| 1 | Pen | stationary | 10.1 | 10 | 101.0 |
| 2 | Pencil | stationary | 5.5 | 5 | 27.5 |
| 3 | Book | stationary | 99.99 | 8 | 799.92 |
| 4 | Mouse | computer | 200.0 | 5 | 1000.0 |
| 5 | Keyboard | computer | 600.0 | 2 | 1200.0 |

3. **Design a JAVA JSP Program to implement verification of a particular user login and display a welcome page**

**Code:**

**Index.html:**

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!DOCTYPE html>
<html>
  <head>
      <title>JSP Page</title>
   </head>
   <body>
   <form method="post" action="auth.jsp" >
      <h1>
      User name <input type="text" name="uname" />
      <br>
      Password  <input type="password" name="pwd" />
      <input type="submit" value="Login"  />
       </h1>
   </form>
   </body>
</html>
```

**Auth.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>
      <title>JSP Page</title>
   </head>
   <body>
      <%
         String u=request.getParameter("uname");
         String p=request.getParameter("pwd");
         if ((u.equals("admin"))&& (p.equals("hello")))
                out.println("Welcome "+u+" you are authenticated");
          else
                out.println("Failed Login Attempt");
      %>
```

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

**Web.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd" id="WebApp_ID" version="3.0">
  <display-name>userpass</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.jsp</welcome-file>
    <welcome-file>default.htm</welcome-file>
  </welcome-file-list>
</web-app>
```

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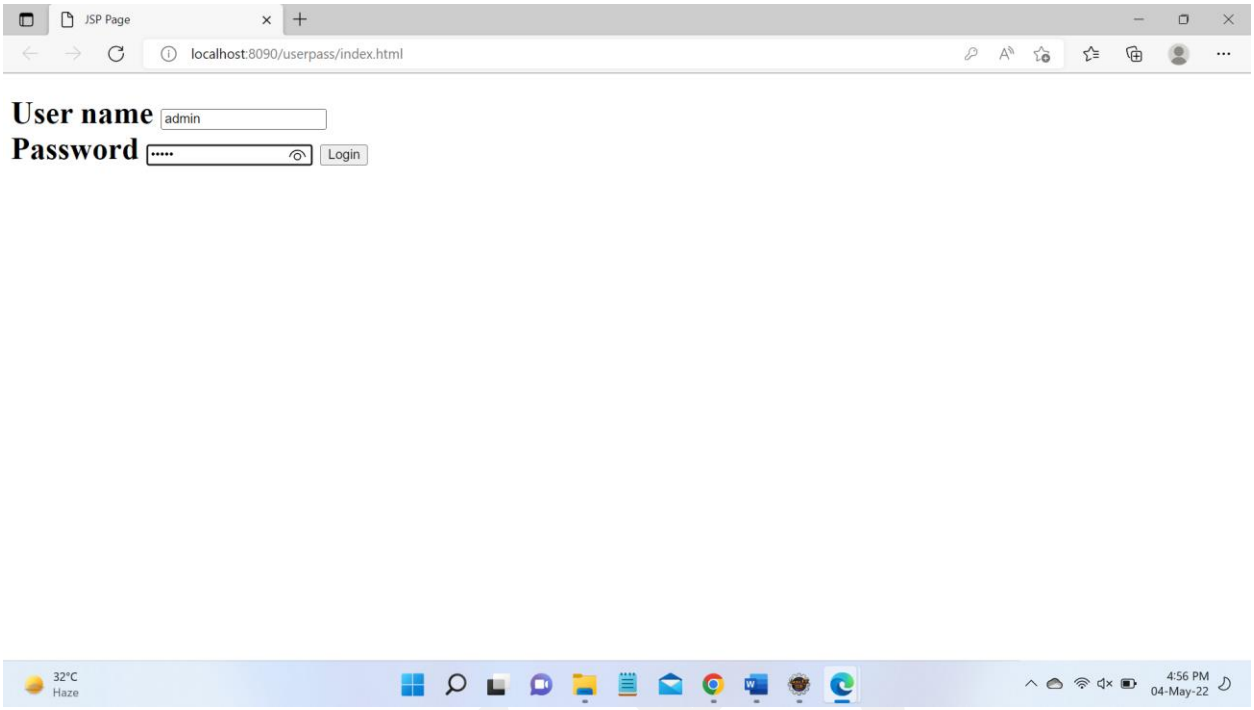
**Output:**



4. **Write a program to design a simple calculator using JSP**

**Code:**

**Calculator.html:**

```
<!DOCTYPE html>
<html>
<title>calculator</title>
<head>
<h1>
        <center>Simple Calculator</center>
</h1>
</head>
<body>
        <center>
                <form action="calculator.jsp" method="get">

                        <label for="num1"><b>Number 1</b></label> <input type="text"
                                name="num1"><br>
                        <br> <label for="num2"><b>Number 2</b></label> <input
                                type="text" name="num2"><br>
                        <br> <input type="radio" name="r1" value="Add">+ <input
                                type="radio" name="r1" value="Sub">-<br> <input
                                type="radio" name="r1" value="mul">* <input type="radio"
                                name="r1" value="div">/<br>
                        <br> <input type="submit" value="submit">
                </form>
        </center>
</body>
</html>
```

**Calculator.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>
<title>calculator</title>
<head></head>
<body>
        <%@page language="java"%>
        <%
 int num1 = Integer.parseInt(request.getParameter("num1"));
 int num2 = Integer.parseInt(request.getParameter("num2"));
```

```
String operation = request.getParameter("r1");
if(operation.equals("Add")){
int add=num1+num2;
out.println("Addition is: "+add);
}
else if(operation.equals("Sub")){
int sub=num1-num2;
out.println("Substraction is: "+sub);
}
else if(operation.equals("mul")){
int mul=num1*num2;
out.println("multiplication is: "+mul);
}
else if(operation.equals("div"))
{
int div = num1/num2;

if(num1>=num2)
out.println("division is: "+div);
else
out.println("The division cannot be performed");
}
%>
</body>
</html>
```

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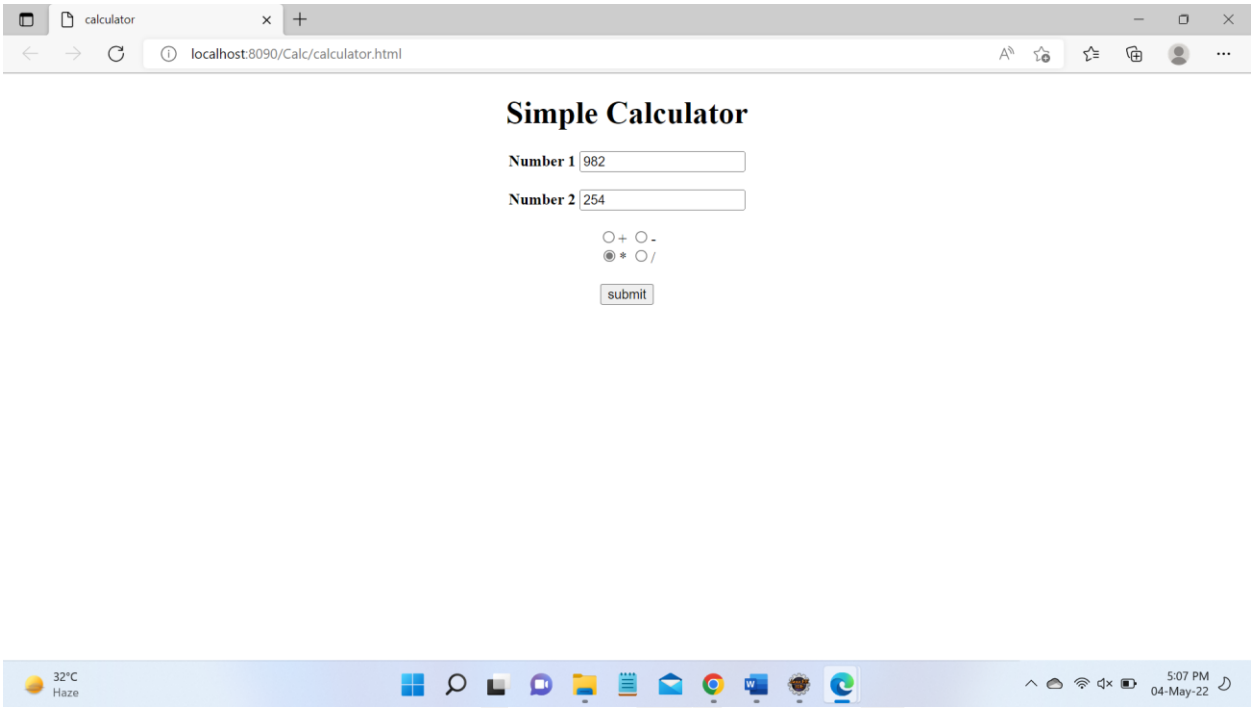
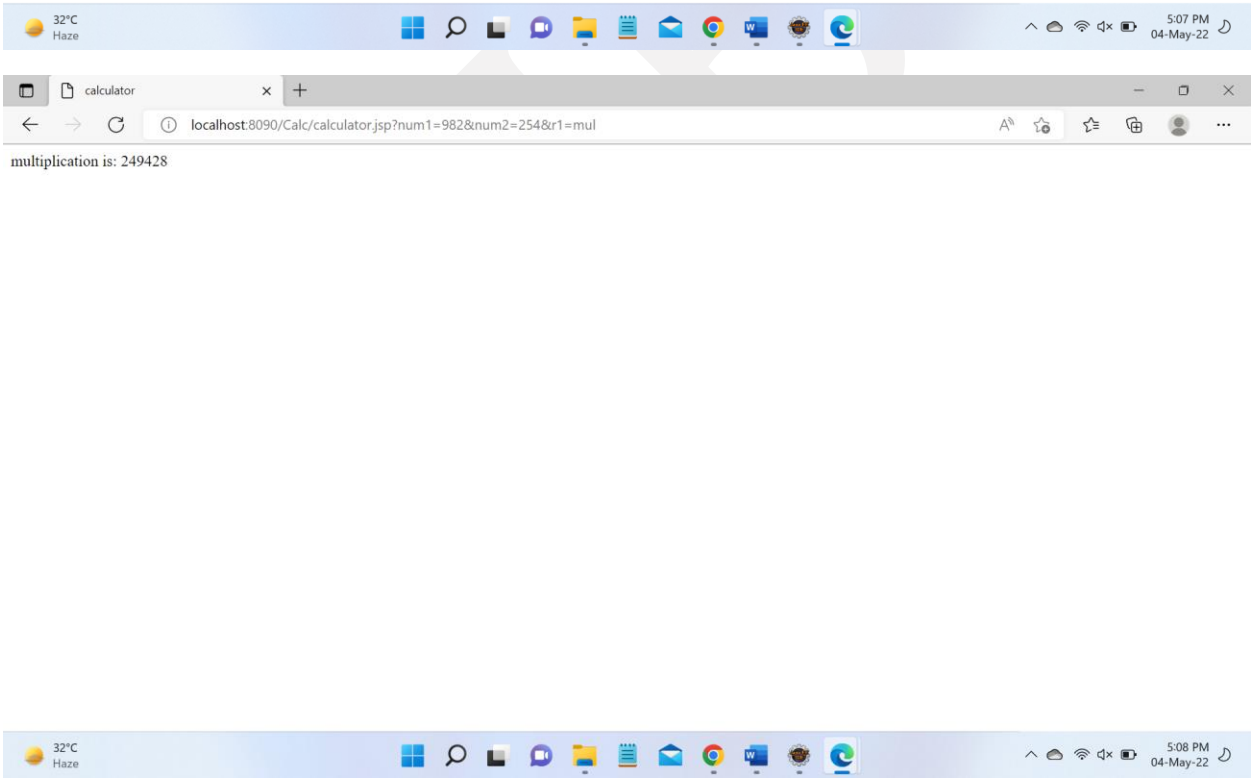
**Output:**



Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

## JSF

1. **Write a JSF application to print Hello World.**

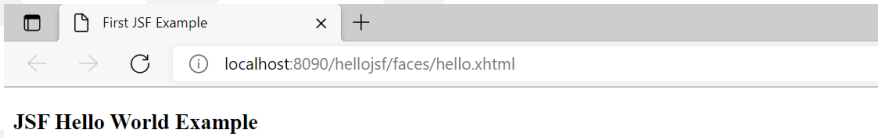
**Code:**

**Hello.xhtml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:f="http://java.sun.com/jsf/core"
      xmlns:h="http://java.sun.com/jsf/html">

<h:head>
      <title>First JSF Example</title>
</h:head>
<h:body>
      <h3>JSF Hello World Example</h3>
</h:body>
</html>
```

**Output:**



Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

2. **Write a JSF application for Celsius to Fahrenheit convertor.**

**Code:**

**TemperatureConvertor.java:**

```
package shibu.jsf.jsfDemo.model;

public class TemperatureConvertor {
	private double celsius;
	private double fahrenheit;
	private boolean initial = true;

	public double getCelsius() {
		return celsius;
	}

	public void setCelsius(double celsius) {
		this.celsius = celsius;
	}

	public double getFahrenheit() {
		return fahrenheit;
	}

	public boolean getInitial() {
		return initial;
	}

	public String reset() {
		initial = true;
		fahrenheit = 0;
		celsius = 0;
		return "reset";
	}

	public String celsiusToFahrenheit() {
		initial = false;
		fahrenheit = (celsius * 9 / 5) + 32;
		return "calculated";
	}
}
```

**Faces-config.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<faces-config
   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-facesconfig_2_2.xsd"
   version="2.2">
        <managed-bean>
                <managed-bean-name>temperatureConvertor</managed-bean-name>
                <managed-bean-
class>shibu.jsf.jsfDemo.model.TemperatureConvertor</managed-bean-class>
                <managed-bean-scope>session</managed-bean-scope>
        </managed-bean>

</faces-config>
```

**Web.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://java.sun.com/xml/ns/javaee"
xsi:schemaLocation="http://java.sun.com/xml/ns/javaee http://java.sun.com/xml/ns/javaee/web-
app_3_0.xsd" id="WebApp_ID" version="3.0">
  <display-name>jsfDemo</display-name>
  <welcome-file-list>
    <welcome-file>index.html</welcome-file>
    <welcome-file>index.jsp</welcome-file>
    <welcome-file>index.htm</welcome-file>
    <welcome-file>default.html</welcome-file>
    <welcome-file>default.jsp</welcome-file>
    <welcome-file>default.htm</welcome-file>
  </welcome-file-list>
  <servlet>
    <servlet-name>Faces Servlet</servlet-name>
    <servlet-class>javax.faces.webapp.FacesServlet</servlet-class>
    <load-on-startup>1</load-on-startup>
  </servlet>
  <servlet-mapping>
    <servlet-name>Faces Servlet</servlet-name>
    <url-pattern>/faces/*</url-pattern>
  </servlet-mapping>
  <context-param>
    <description>State saving method: 'client' or 'server' (=default). See JSF Specification
2.5.2</description>
```

```
    <param-name>javax.faces.STATE_SAVING_METHOD</param-name>
    <param-value>client</param-value>
  </context-param>
  <context-param>
    <param-name>javax.servlet.jsp.jstl.fmt.localizationContext</param-name>
    <param-value>resources.application</param-value>
  </context-param>
  <listener>
    <listener-class>com.sun.faces.config.ConfigureListener</listener-class>
  </listener>
</web-app>
```

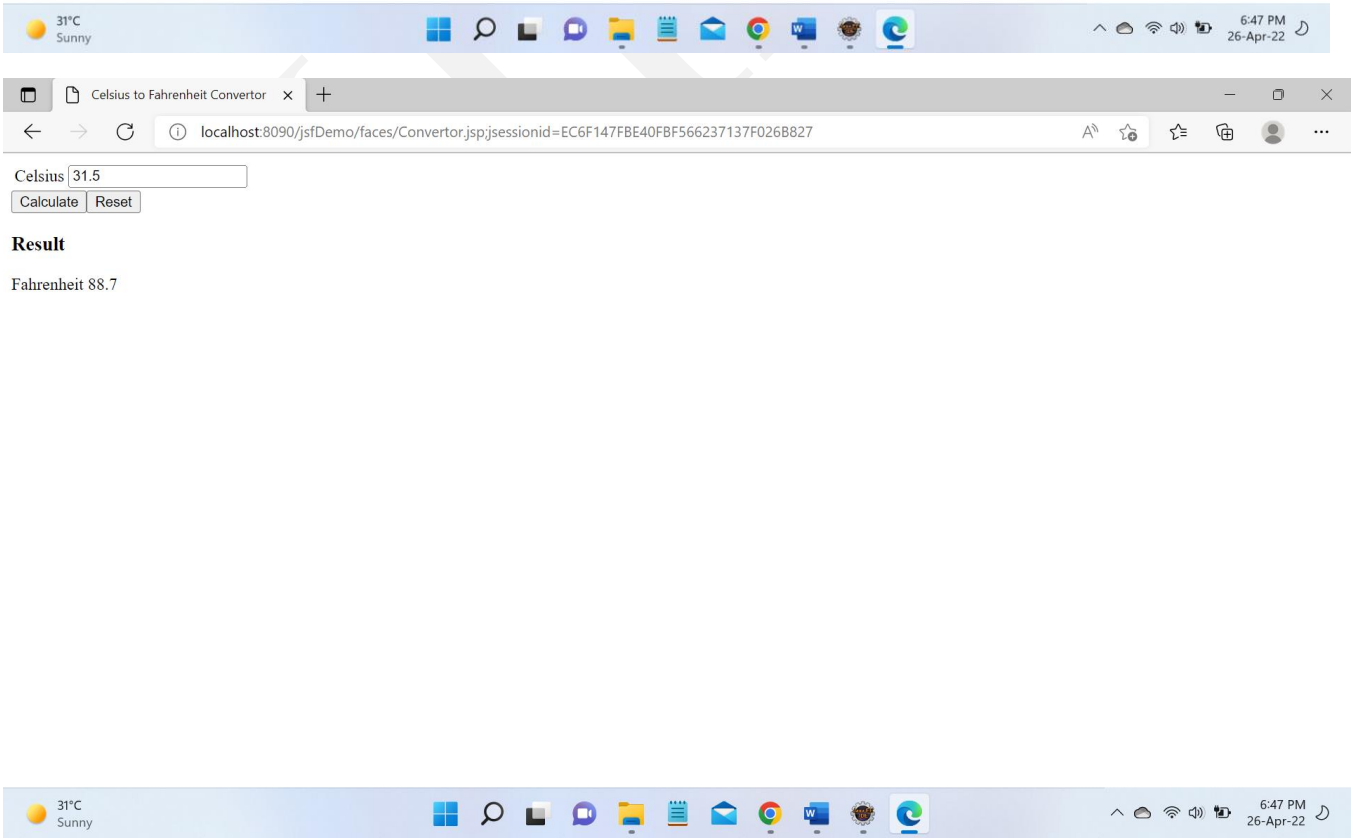
**Convertor.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
<%@ taglib prefix="f"  uri="http://java.sun.com/jsf/core"%>
<%@ taglib prefix="h"  uri="http://java.sun.com/jsf/html"%>
<!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>Celsius to Fahrenheit Convertor</title>
</head>
<body>
<f:view>
    <h:form>
        <h:panelGrid columns="2">
            <h:outputLabel value="Celsius"></h:outputLabel>
            <h:inputText  value="#{temperatureConvertor.celsius}"></h:inputText>
        </h:panelGrid>
        <h:commandButton action="#{temperatureConvertor.celsiusToFahrenheit}"
value="Calculate"></h:commandButton>
        <h:commandButton action="#{temperatureConvertor.reset}"
value="Reset"></h:commandButton>
        <h:messages layout="table"></h:messages>
    </h:form>

    <h:panelGroup rendered="#{temperatureConvertor.initial!=true}">
    <h3> Result </h3>
    <h:outputLabel value="Fahrenheit "></h:outputLabel>
    <h:outputLabel value="#{temperatureConvertor.fahrenheit}"></h:outputLabel>
    </h:panelGroup>
</f:view>
```

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

## Output:

3. **Design following JSF application to accept username in textbox. if user textbox is empty show validation message.**

**Code:**

**HelloBean.java;**

```
package com.shibu.hellojsf;

import javax.faces.bean.ManagedBean;
import javax.faces.bean.SessionScoped;
import java.io.Serializable;

@ManagedBean
@SessionScoped
public class HelloBean implements Serializable {

   private static final long serialVersionUID = 1L;

   private String name;

   public String getName() {
      return name;
   }
   public void setName(String name) {
      this.name = name;
   }
}
```

**Hello.xhtml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
        xmlns:f="http://java.sun.com/jsf/core"
        xmlns:h="http://java.sun.com/jsf/html">

<h:head>
        <title>Userform</title>
</h:head>
```

```
<h:body>
        <h3>JSF Hello World Example</h3>
        <h:form>
        What's your name?
        <h:inputText value="#{helloBean.name}"></h:inputText>
                <h:commandButton value="Submit" action="welcome"></h:commandButton>
        </h:form>
</h:body>
</html>
```

**Welcome.xhtml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
     xmlns:h="http://java.sun.com/jsf/html">

   <h:head>
      <title>Welcome</title>
   </h:head>
   <h:body bgcolor="white">
      <h3>Everything went right!</h3>
      <h4>Welcome #{helloBean.name}</h4>
   </h:body>
</html>
```

Faces-cinfig.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<faces-config
   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-facesconfig_2_2.xsd"
   version="2.2">

</faces-config>
```

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**Web.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns="http://JAVA.sun.com/xml/ns/javaee"
	xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
	id="WebApp_ID" version="3.0">
	<display-name>HelloJSF</display-name>
	<welcome-file-list>
		<welcome-file>faces/hello.xhtml</welcome-file>
	</welcome-file-list>
	<servlet>
		<servlet-name>Faces Servlet</servlet-name>
		<servlet-class>javax.faces.webapp.FacesServlet</servlet-class>
		<load-on-startup>1</load-on-startup>
	</servlet>
	<servlet-mapping>
		<servlet-name>Faces Servlet</servlet-name>
		<url-pattern>/faces/*</url-pattern>
	</servlet-mapping>
	<servlet-mapping>
		<servlet-name>Faces Servlet</servlet-name>
		<url-pattern>*.jsf</url-pattern>
	</servlet-mapping>
	<servlet-mapping>
		<servlet-name>Faces Servlet</servlet-name>
		<url-pattern>*.faces</url-pattern>
	</servlet-mapping>
	<servlet-mapping>
		<servlet-name>Faces Servlet</servlet-name>
		<url-pattern>*.xhtml</url-pattern>
	</servlet-mapping>
	<context-param>
		<param-name>javax.faces.PROJECT_STAGE</param-name>
		<param-value>Development</param-value>
	</context-param>
	<listener>
		<listener-class>com.sun.faces.config.ConfigureListener
		</listener-class>
	</listener>
</web-app>
```

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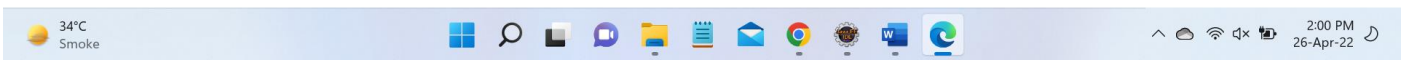
## Output:



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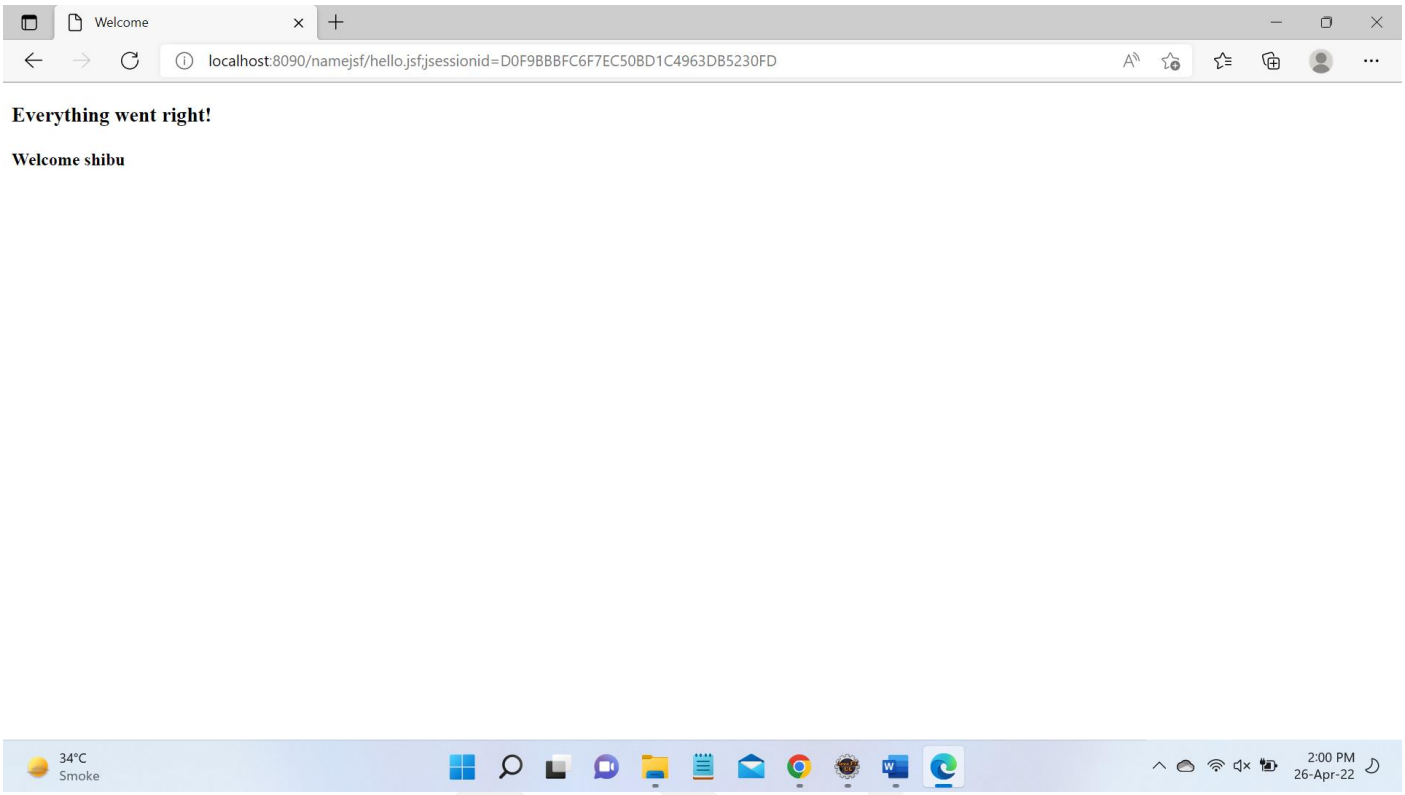


4. **A web application that takes a name as input and on submit it shows a hello <name> page where name is taken from the request. It shows the start time at the right top corner of the page and provides a logout button. On clicking this button, it should show a logout page with Thank You <name > message with the duration of usage (hint: Use session to store name and time).**

**Code:**

**Session.xhtml:**

```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head> <title> SESSION LOGIN </title> </head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
<body>
<center>
<form action="Session1.jsp" method="get">
Enter Name: <input type="text" name="uname" />
<input type="submit" value="LOGIN" name="register" />
</form>
</center>
</body>
</html>
```

**Session1.jsp:**

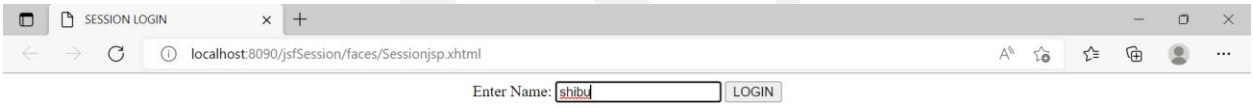
```
<%@page language="java" import="java.util.*" errorPage=""%>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
<%@ taglib prefix="f"  uri="http://java.sun.com/jsf/core"%>
<%@ taglib prefix="h"  uri="http://java.sun.com/jsf/html"%>
<form method="get" action="Session2.jsp">
<%
Date d=new Date();
%>
<p align="right"> Time;<%=d.getTime()%></p>
<%
String un=request.getParameter("uname");
session.setAttribute("user",un);
session.setAttribute("time",d.getTime());
%>
Hello <%=un%>
<br><br>
```

```
<input type="submit" value="logout">
</form>
```

**Session2.jsp:**

```
<%@page language="java" import="java.util.*" errorPage=""%>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
pageEncoding="ISO-8859-1"%>
<%@ taglib prefix="f"  uri="http://java.sun.com/jsf/core"%>
<%@ taglib prefix="h"  uri="http://java.sun.com/jsf/html"%>
<%
Date d2=new Date();
String un=(String)session.getAttribute("user");
Long t1=(Long)session.getAttribute("time");
Long t2=d2.getTime();
%>
Thank you <%=un%>
<br><br>
Session duration: <%=(t2-t1)/(60*60)%> seconds
<% session.invalidate();%>
```

**Output:**

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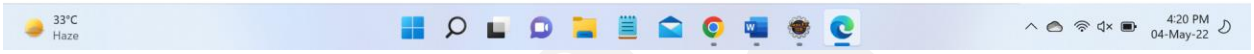



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# HIBERNATE

1. **Creating hibernate example to print “Hello Word”.**

**Code:**

**hello.java:**

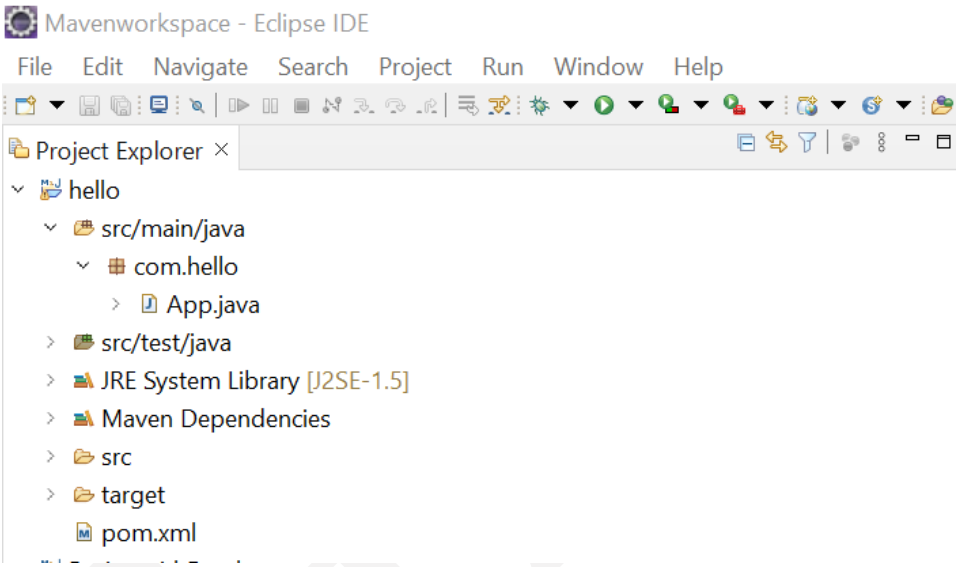
```
package com.hello;

/**
 * Hello world!
 *
 */
public class App
{
    public static void main( String[] args )
    {
        System.out.println( "Hello World!" );
    }
}
```

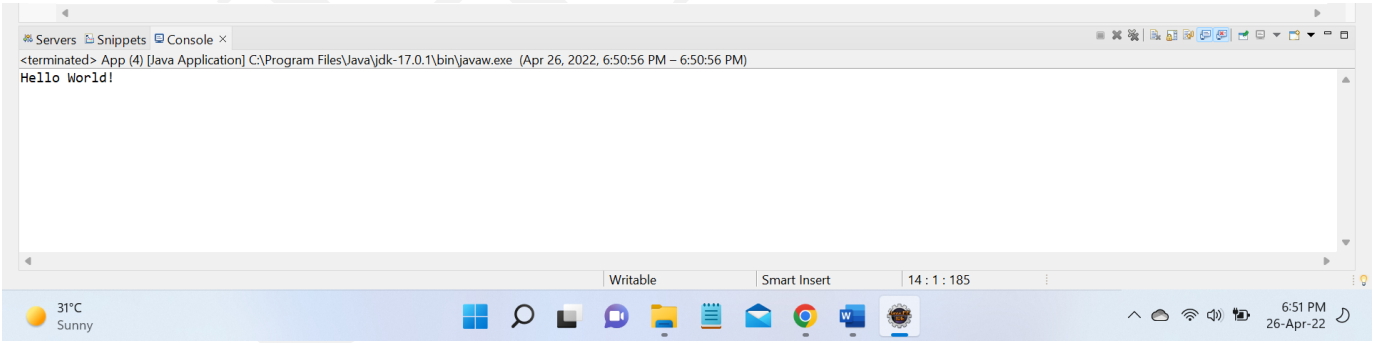
**Pom.xml:**

```
<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.spring.mvc</groupId>
  <artifactId>hello</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>hello</name>
  <url>http://maven.apache.org</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>

  <dependencies>
    <dependency>
```

```
    <groupId>junit</groupId>
    <artifactId>junit</artifactId>
    <version>3.8.1</version>
    <scope>test</scope>
   </dependency>
  </dependencies>
</project>
```

**Output:**



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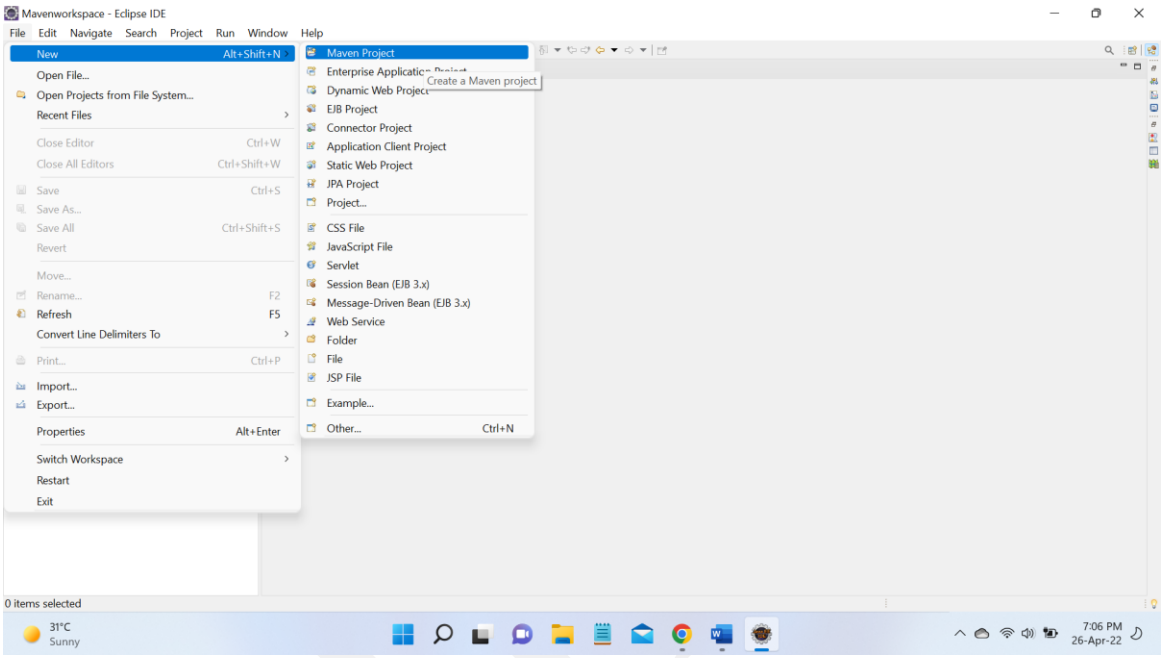
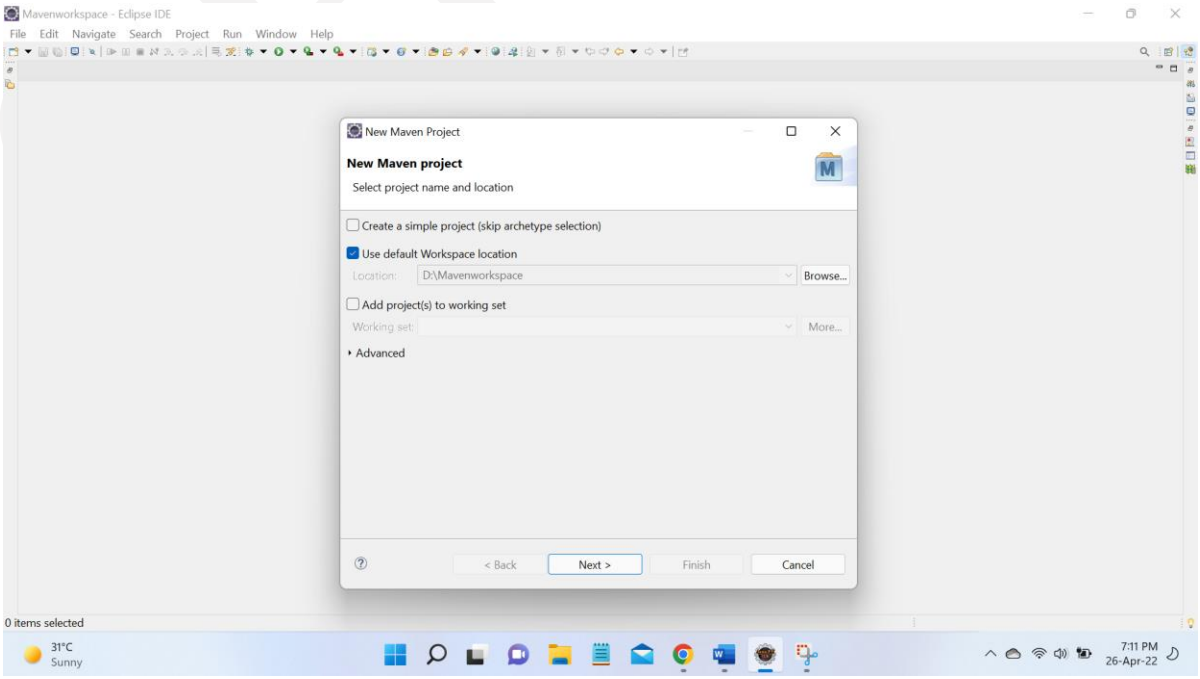
2. **A) Create Maven Project for hibernate to add dependencies**
   **B) Configure hibernate program**

## A. Create Maven Project for hibernate to add dependencies

i. New => maven project




ii. switch directory (if necessary) or just click next



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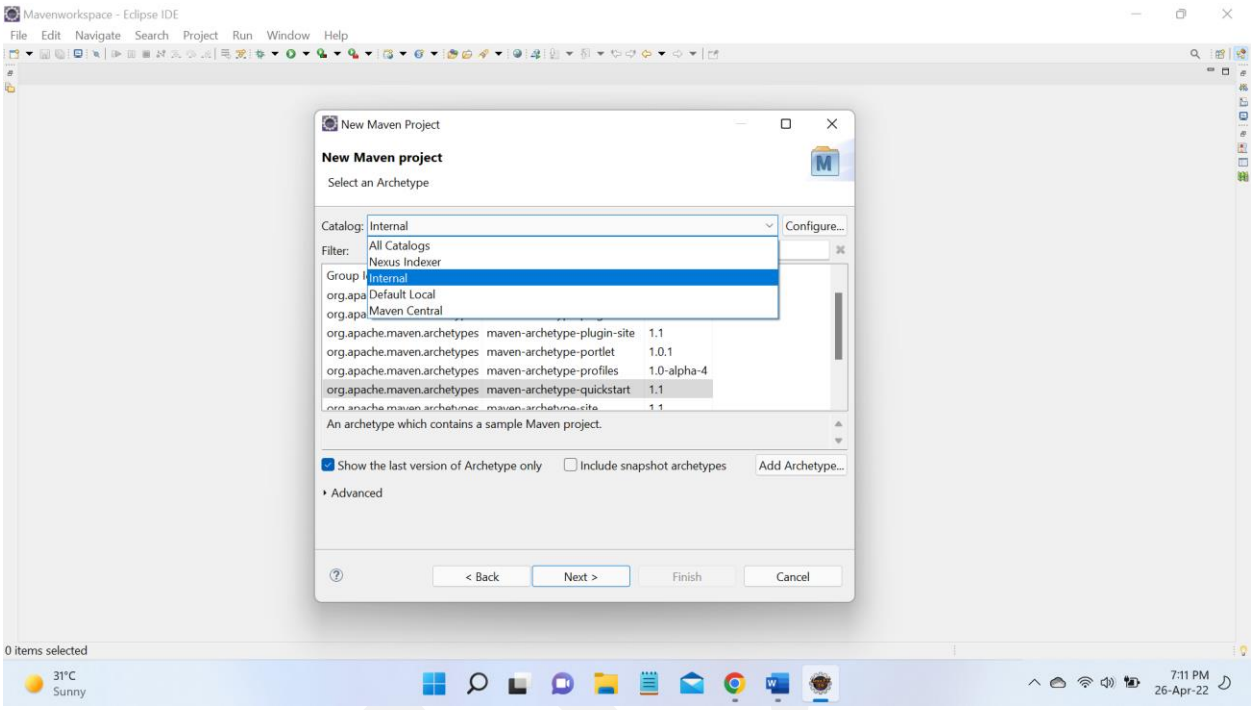
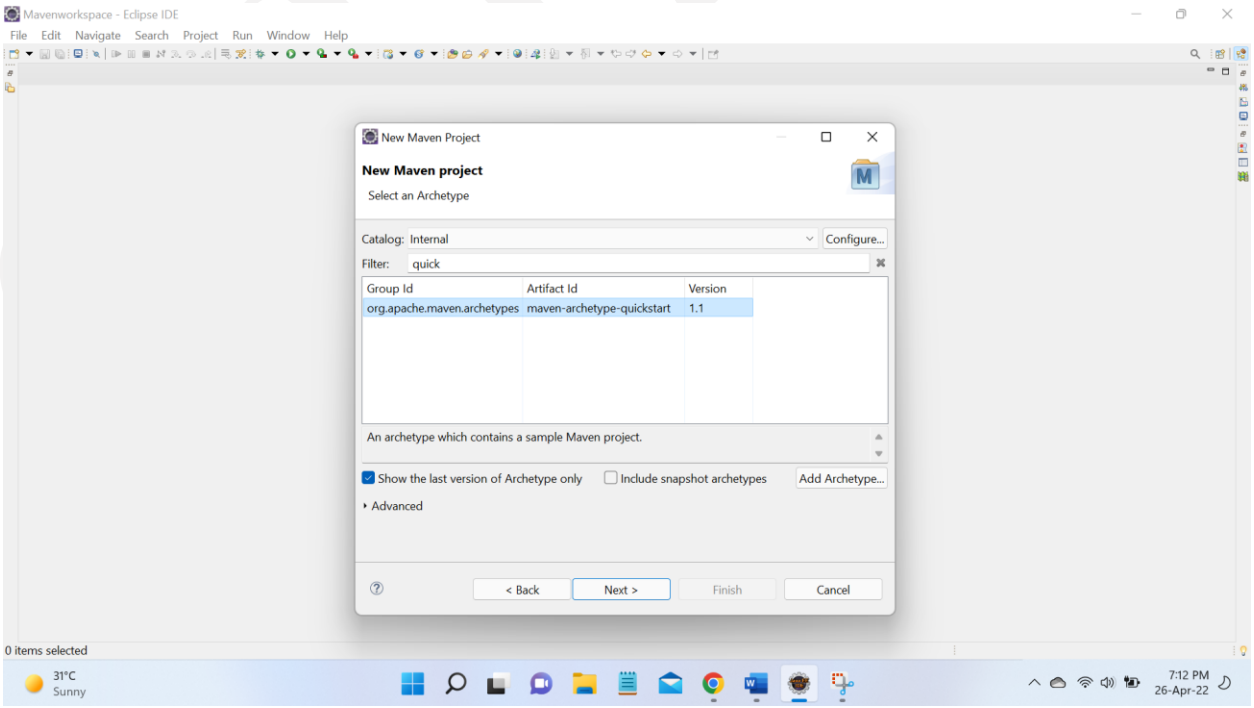
iii. catalog (select internal)




iv. filter (type quick) => select quickstart and click on Next



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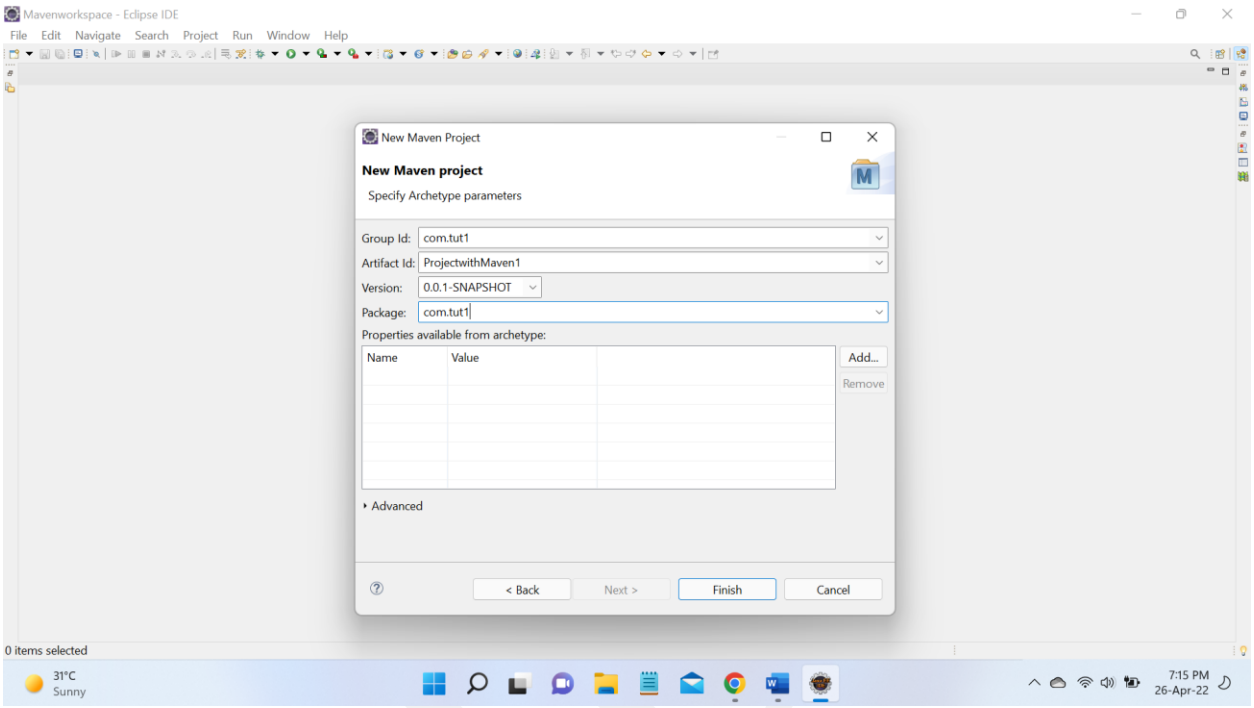
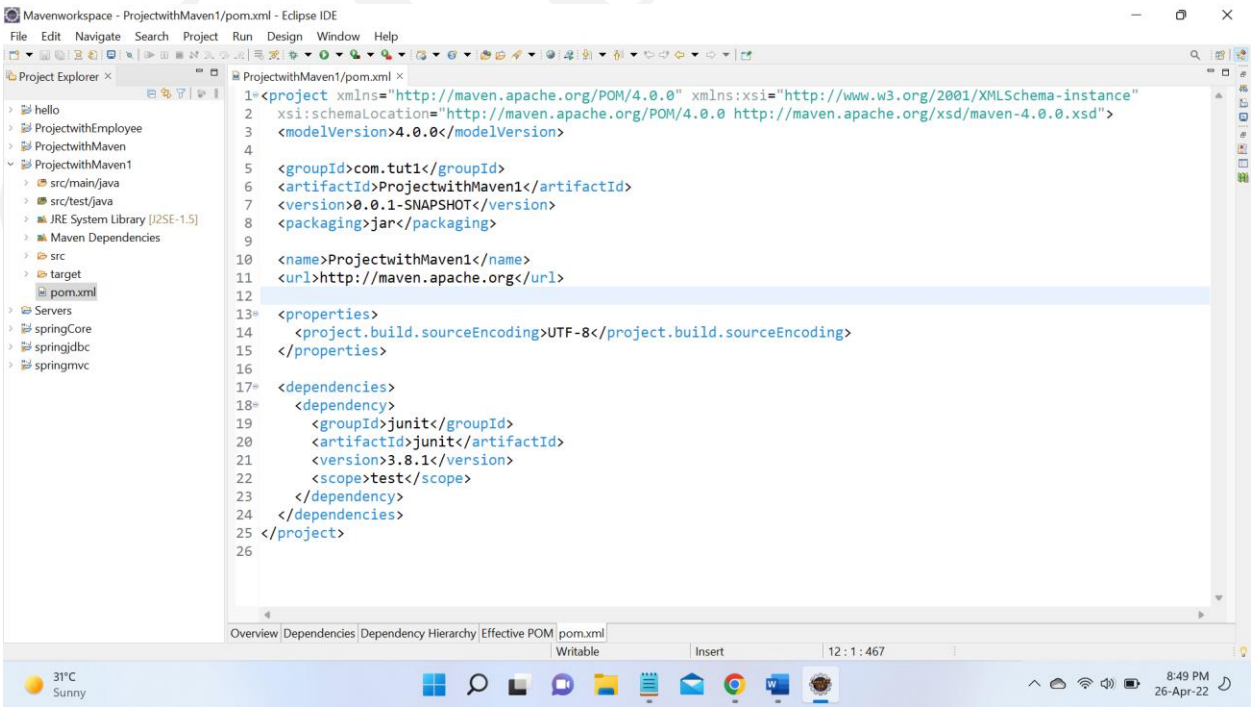
v. Write group id (com tut) => artifact Id (ProjectwithMaven) => Package (com tut) => Click on finish.




vi. Explore project, POM file is important



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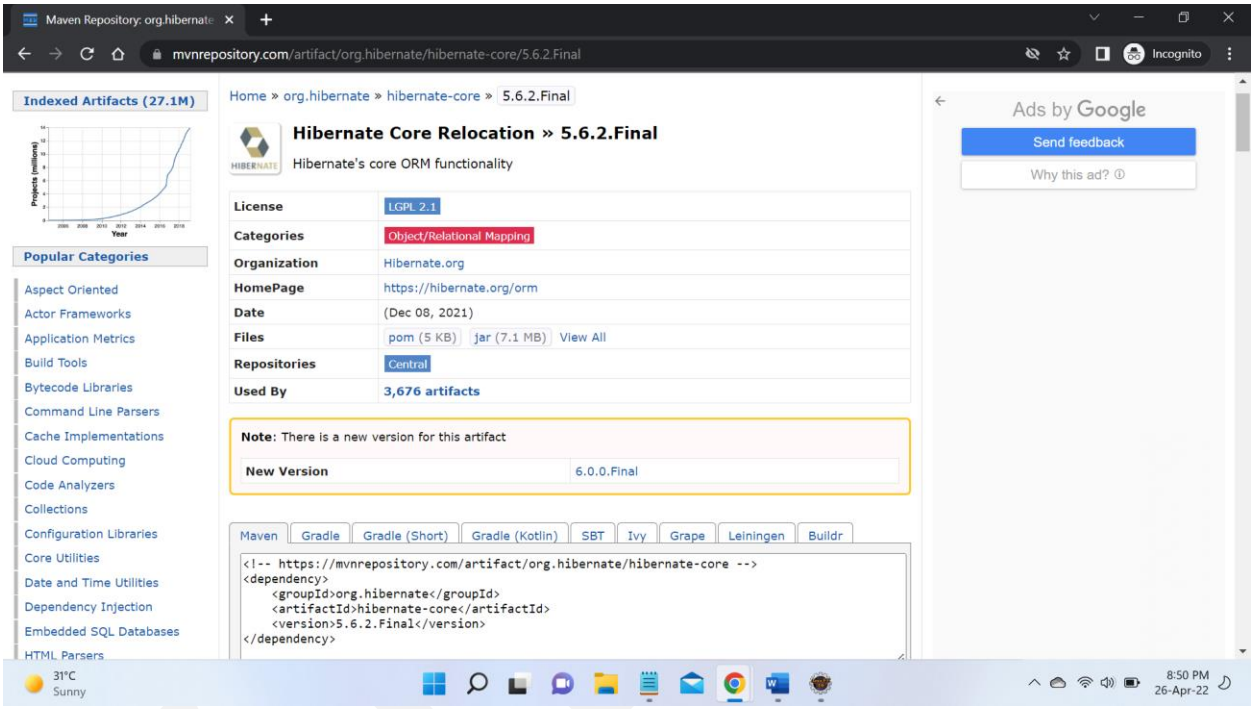
vii. Copy the maven code in the website & paste it in pom.xml under **<dependencies>** tag from below website

https://mvnrepository.com/artifact/org.hibernate/hibernate-core/5.6.2.Final




<!-- https://mvnrepository.com/artifact/org.hibernate/hibernate-core -->

<dependency>

<groupId>org.hibernate</groupId>

<artifactId>hibernate-core</artifactId>

<version>5.6.2.Final</version>

</dependency>

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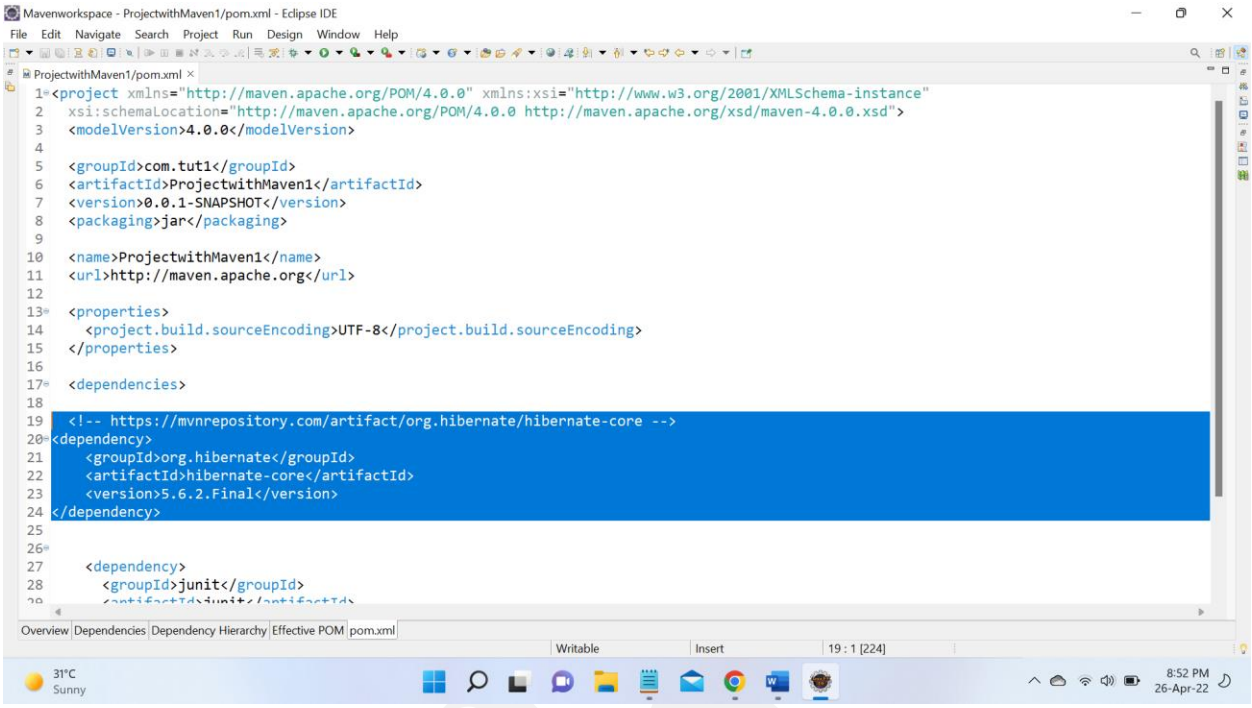
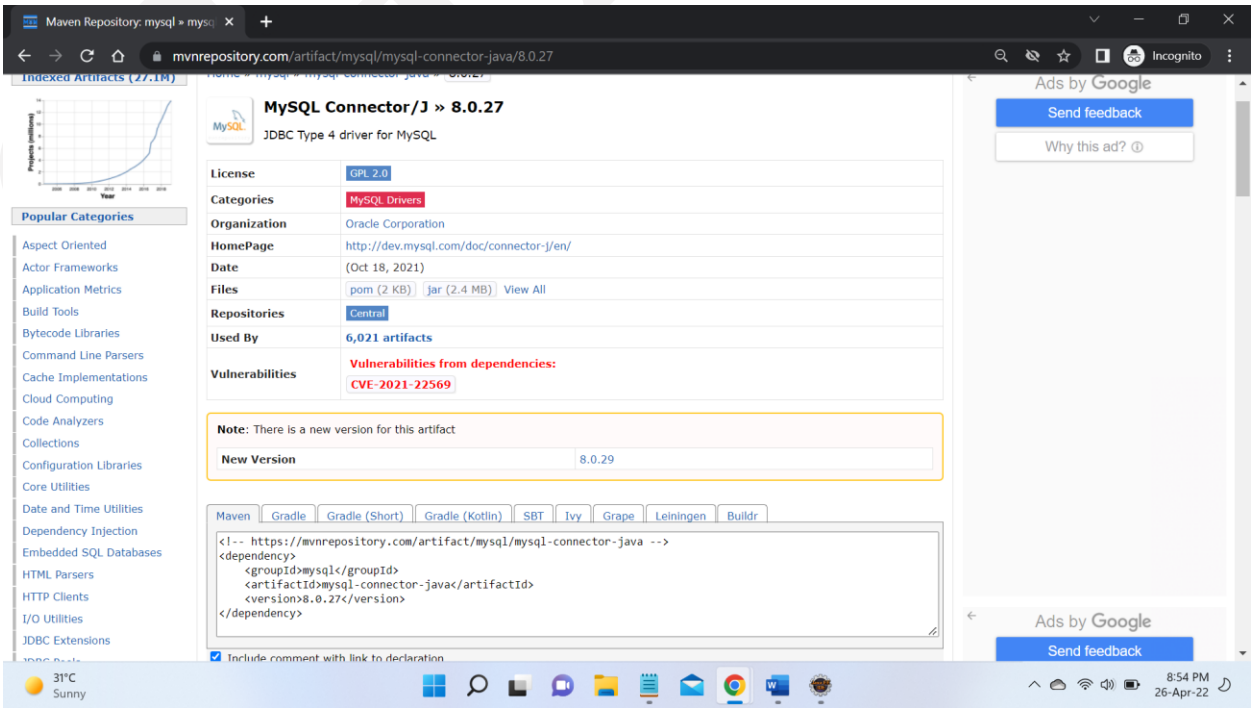



viii. Again do same for mysql maven and paste it on pom.xml under <dependencies> tag from below website

https://mvnrepository.com/artifact/mysql/mysql-connector-java/8.0.27



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<!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->

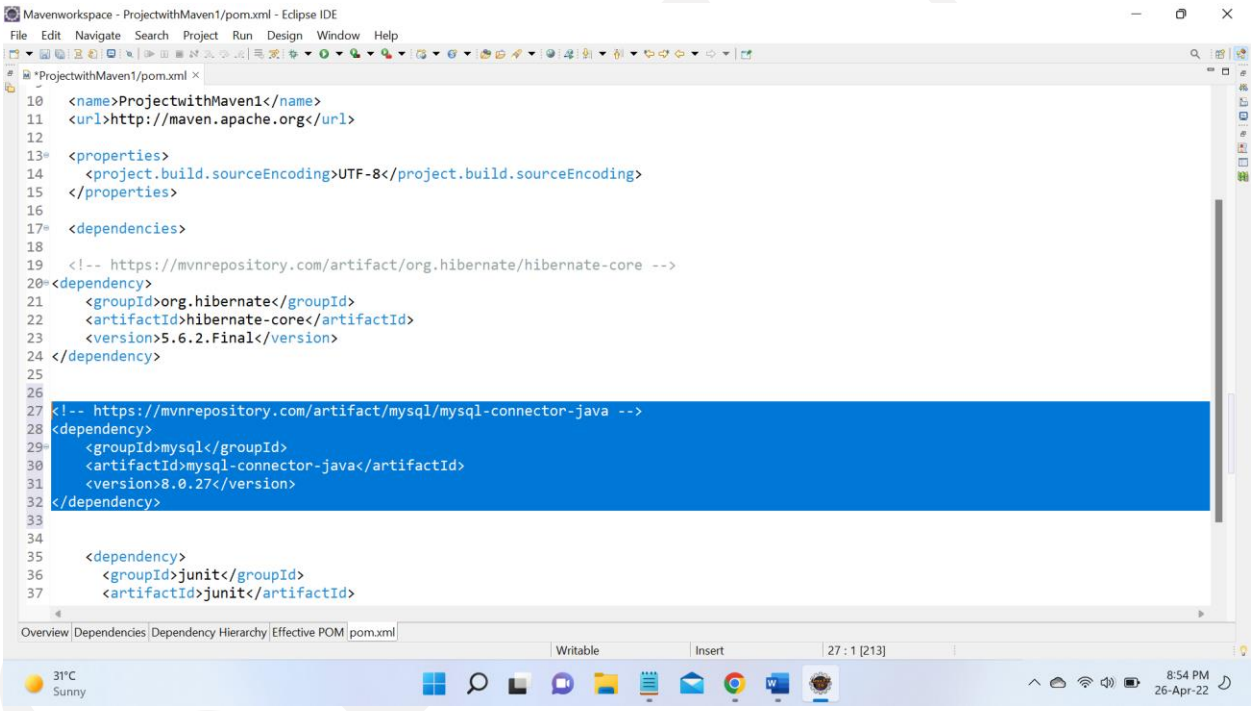
<dependency>

<groupId>mysql</groupId>

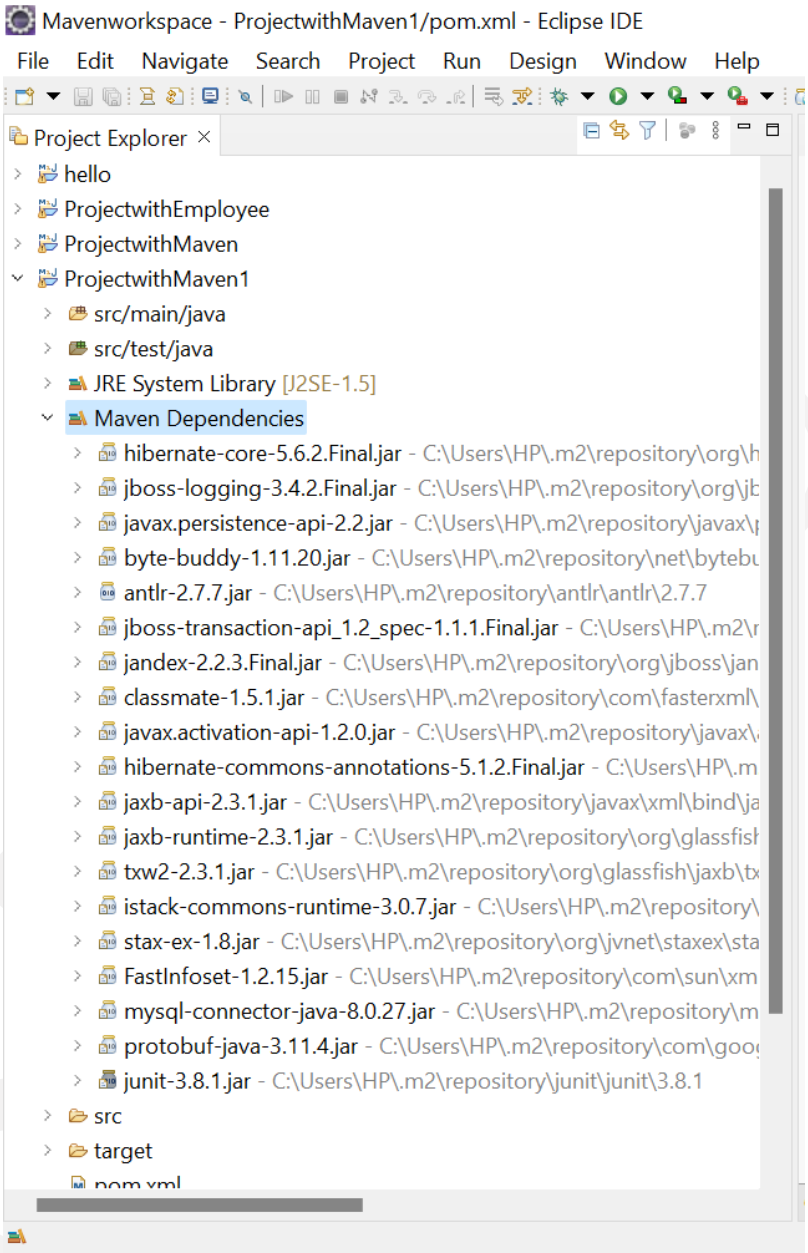
<artifactId>mysql-connector-java</artifactId>

<version>8.0.27</version>

</dependency>



ix. Explore project and all the dependencies will be auto downloaded



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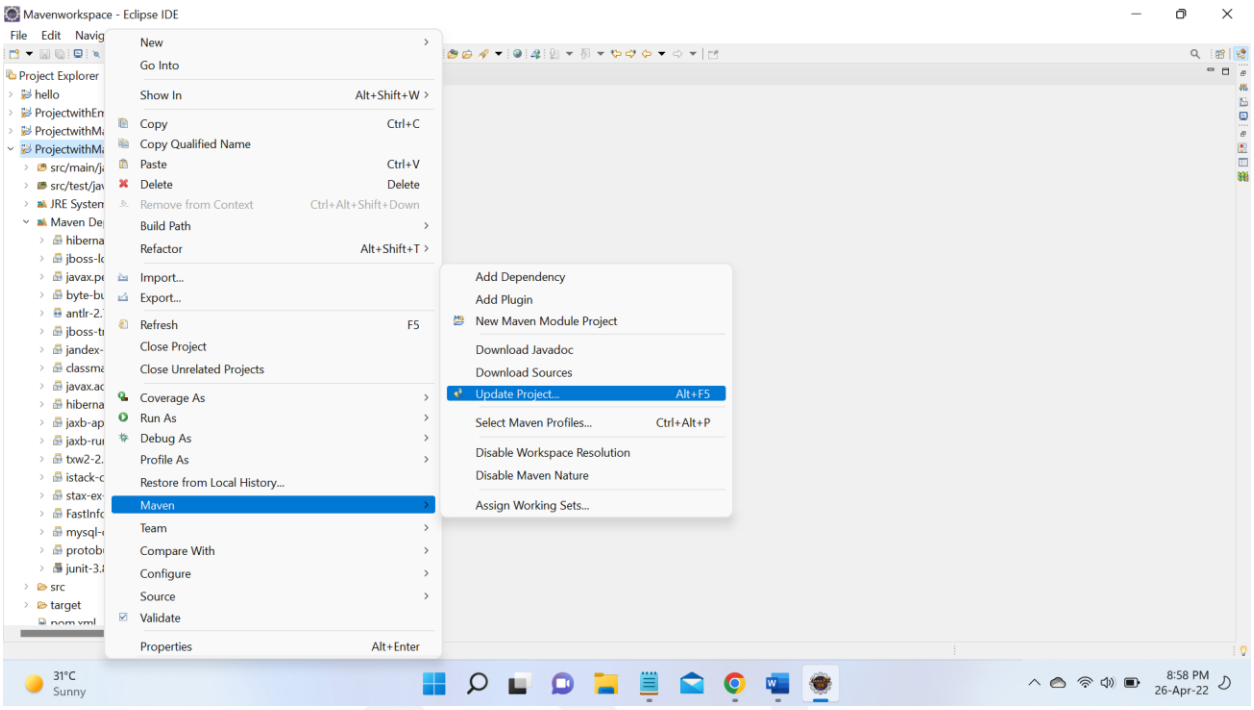
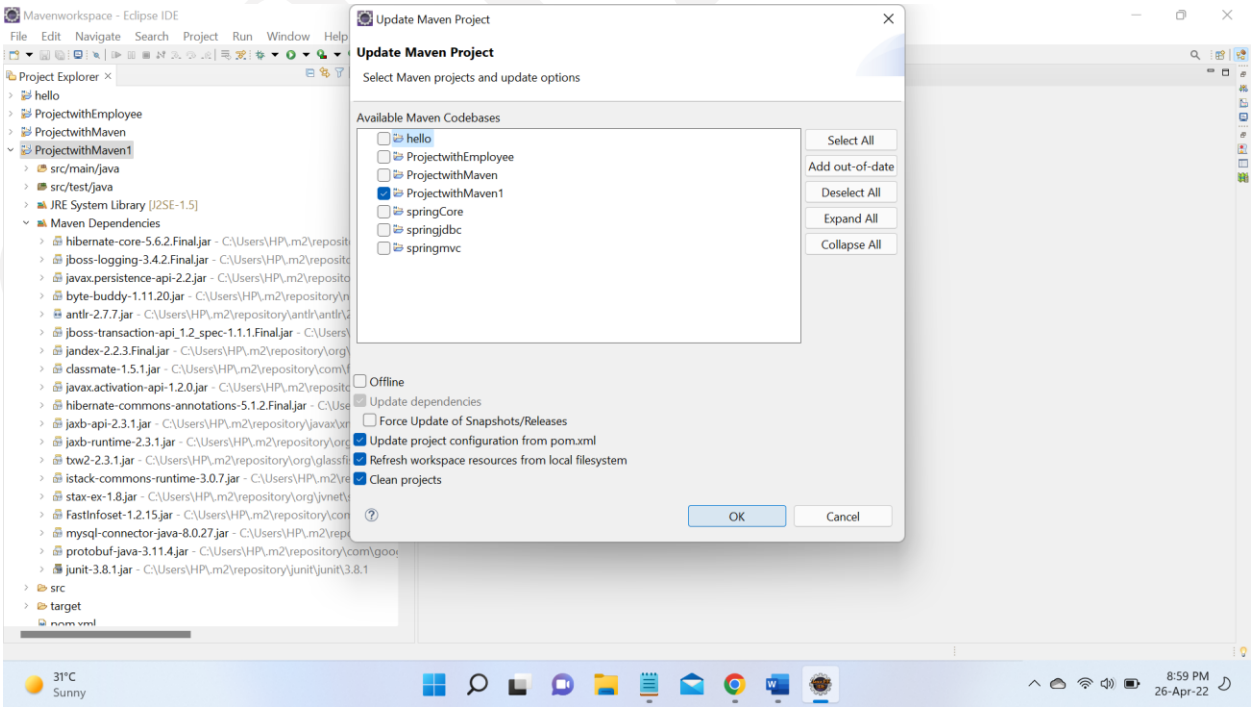
x. Now right click on project => click on maven => update project




xi. Click ok



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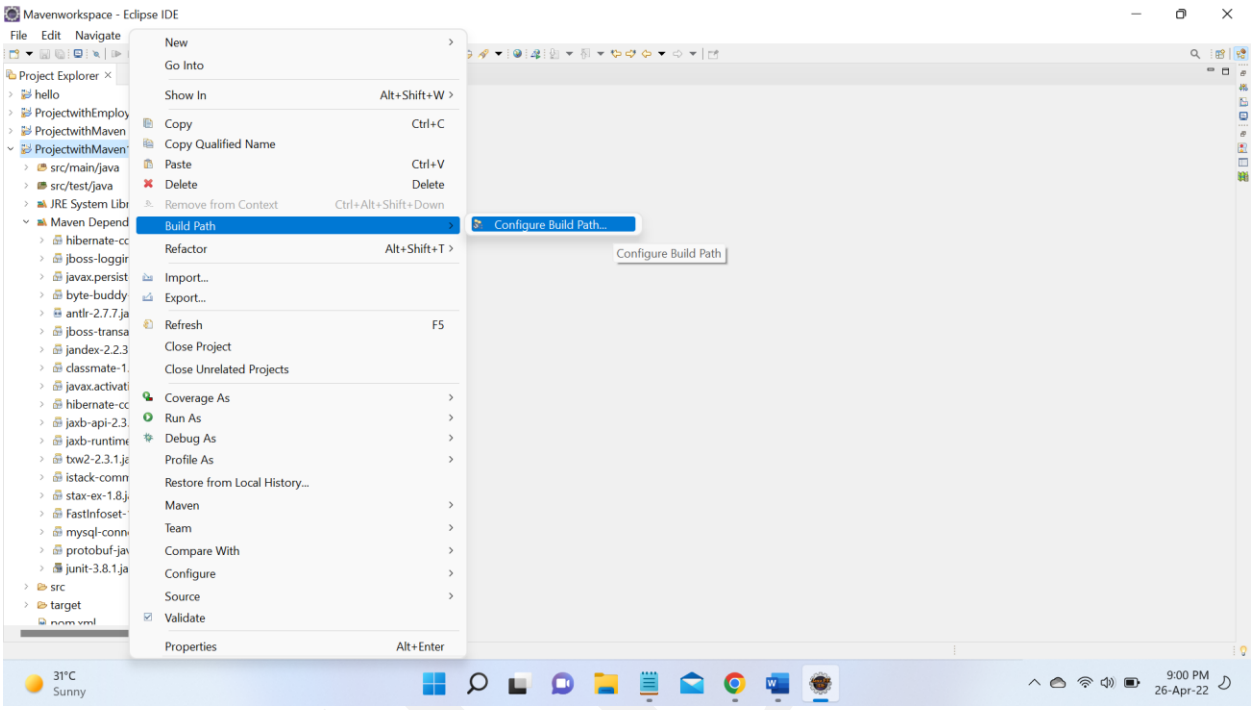
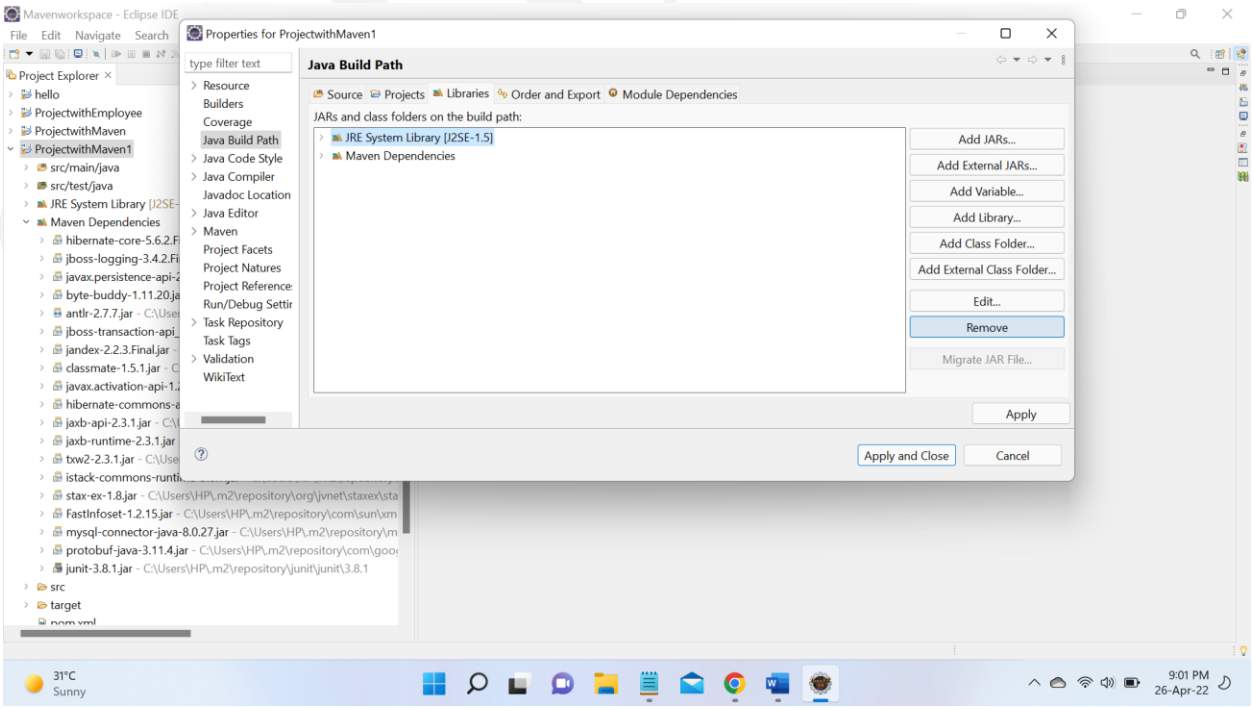
xii. To change JRE environment of your own => right click JRE system => build path => configure build path




xiii. Select JRE system & click on remove



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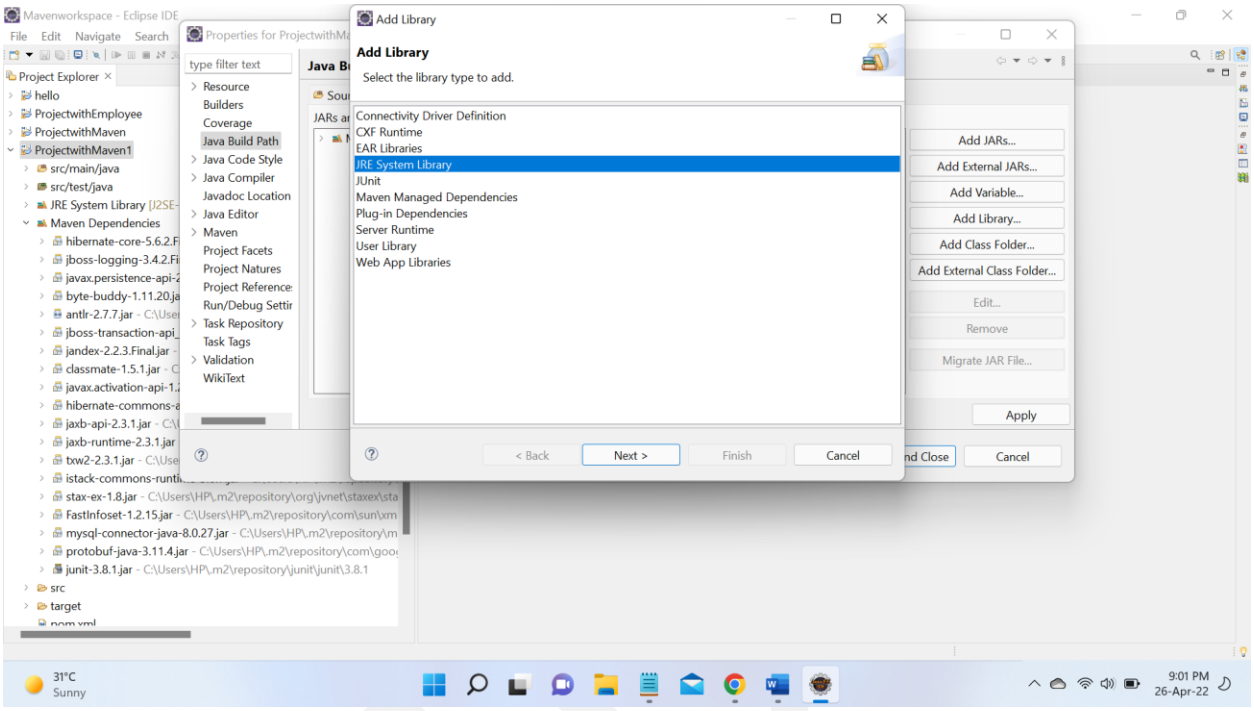
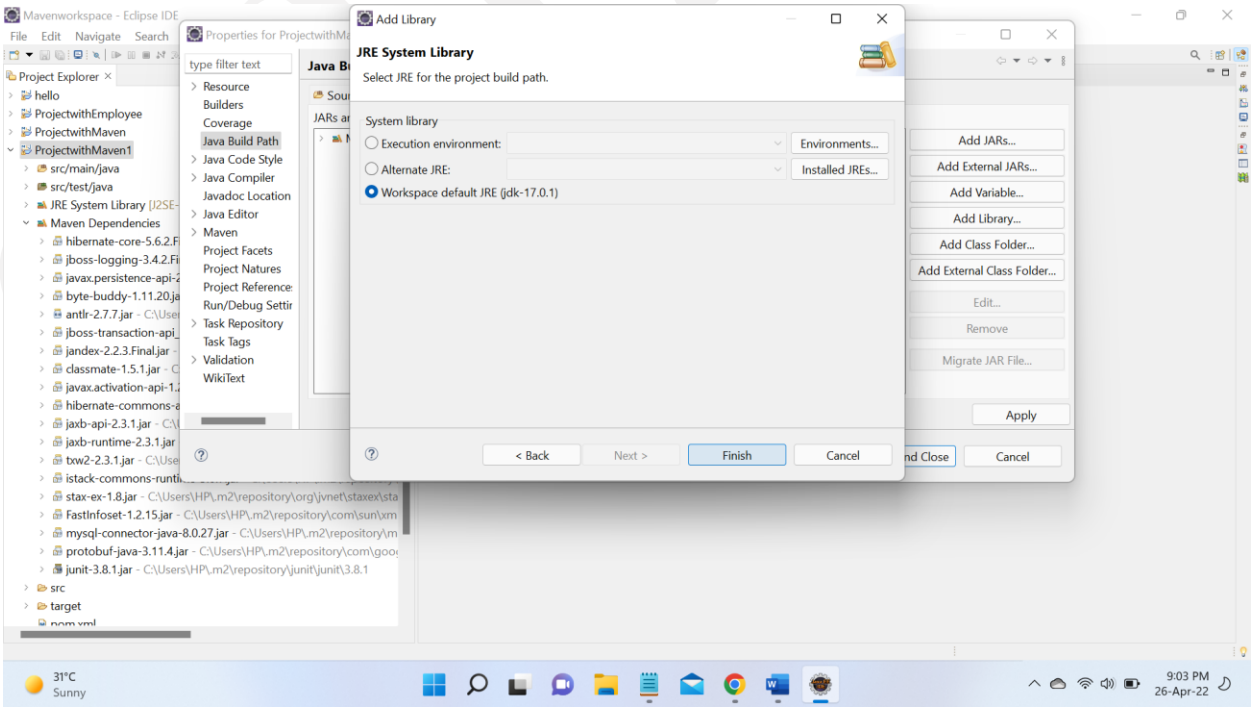
xiv. Now click add library => click JRE system library => click Next




xv. click workspace default library (jdk 17 or whatever user has) => click finish




xvi. Click on apply => apply and close

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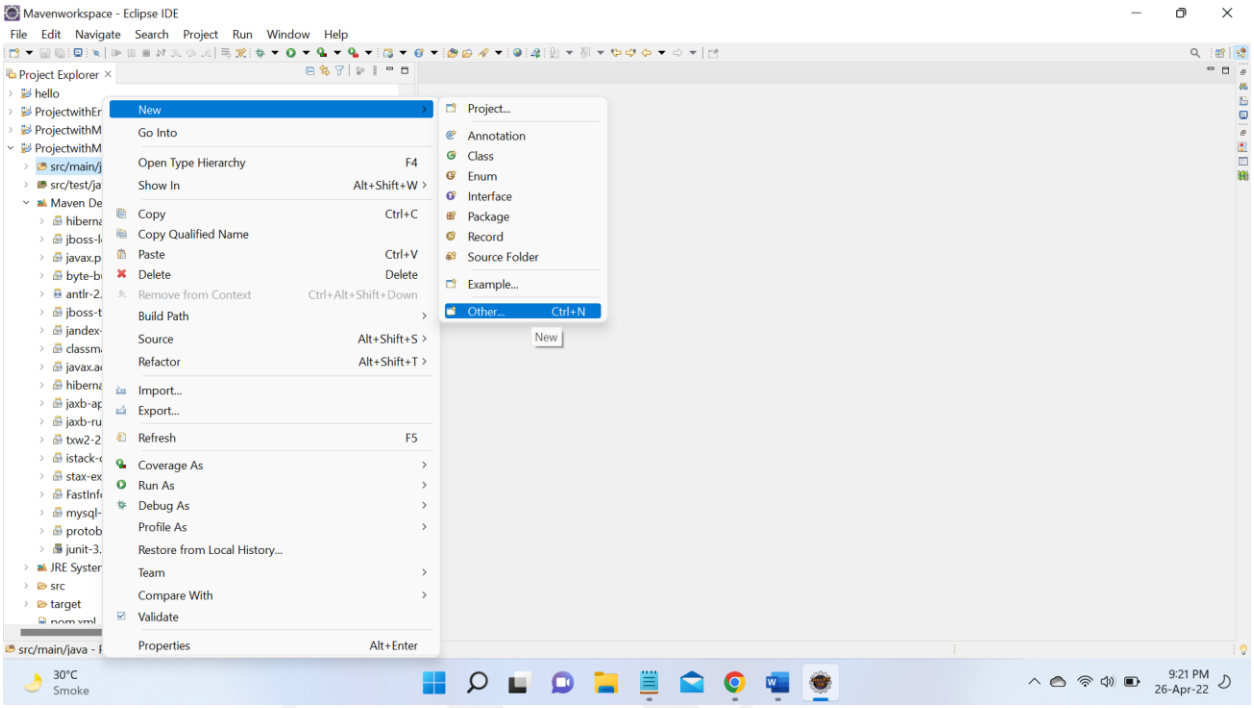
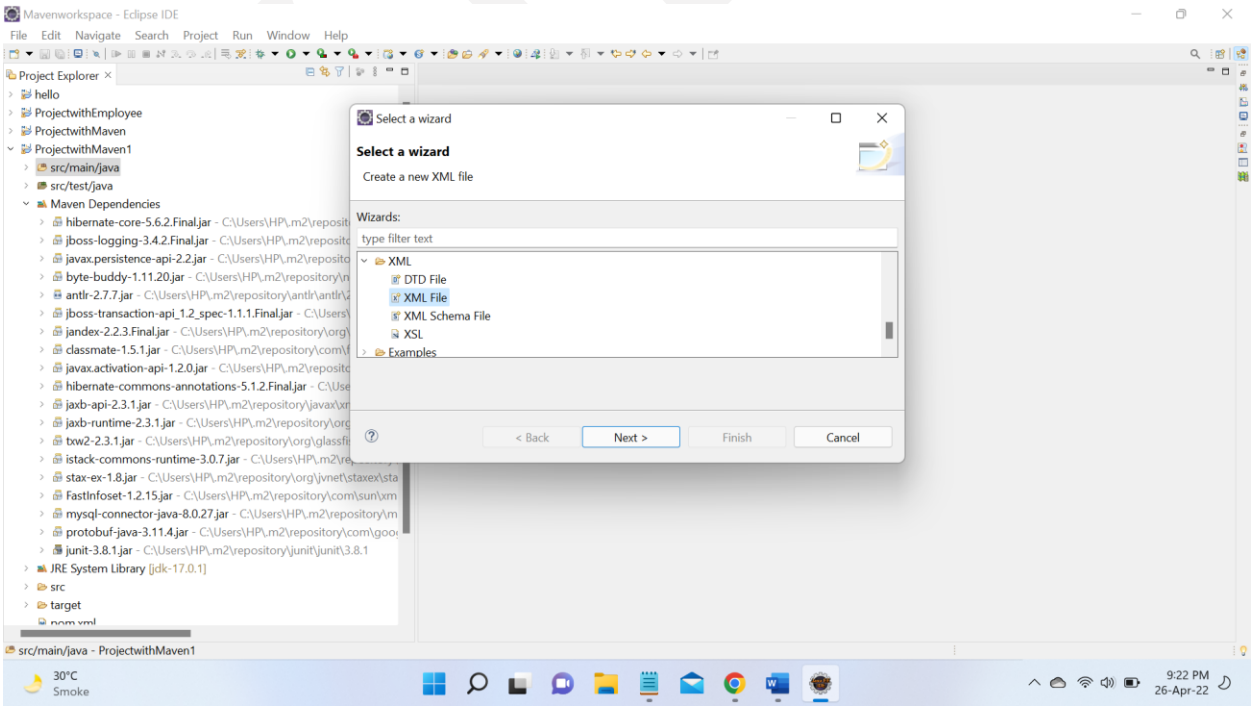
## B. Configure hibernate program

i. Right click on src/java/main

ii. New => XML file => name it hibernate.cfg.xml => Next => click on Finish



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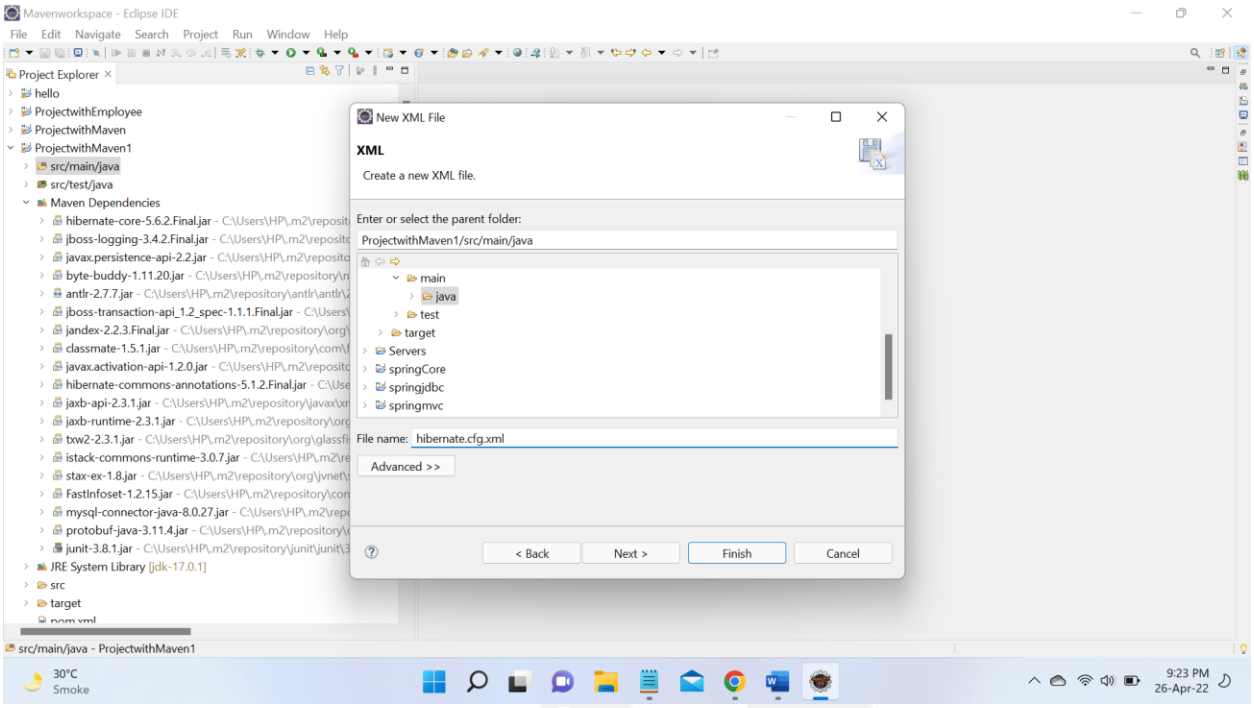


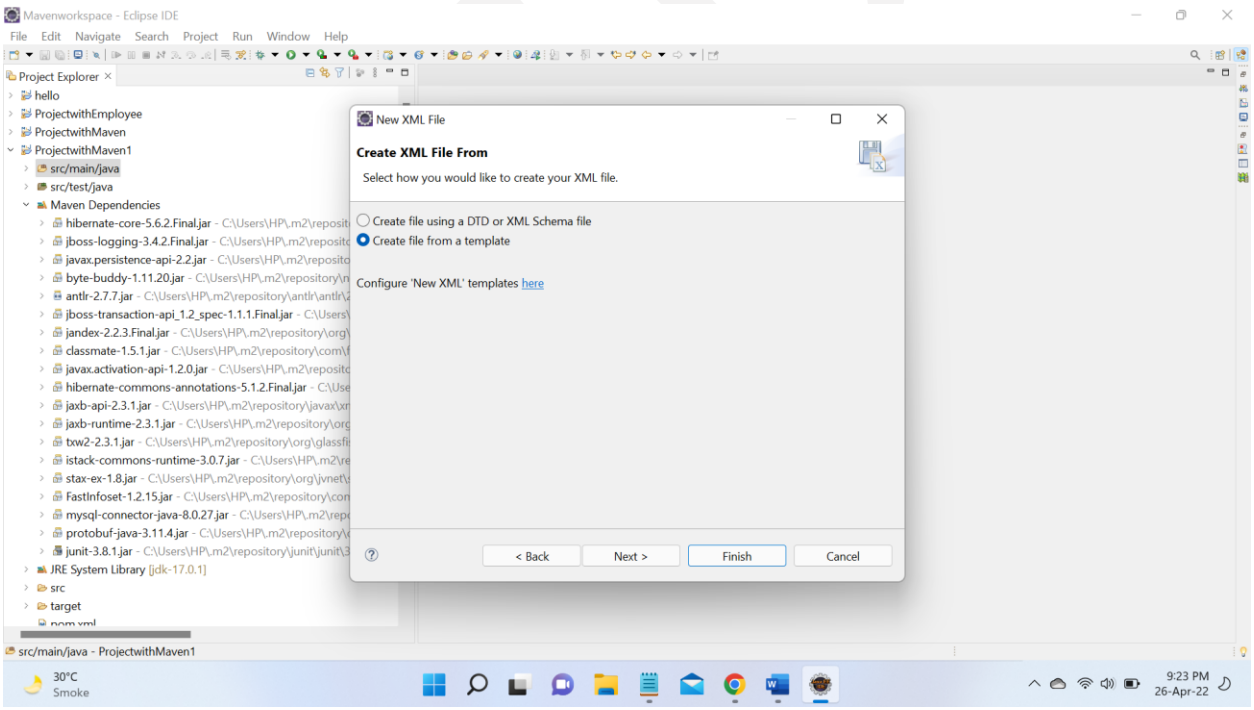

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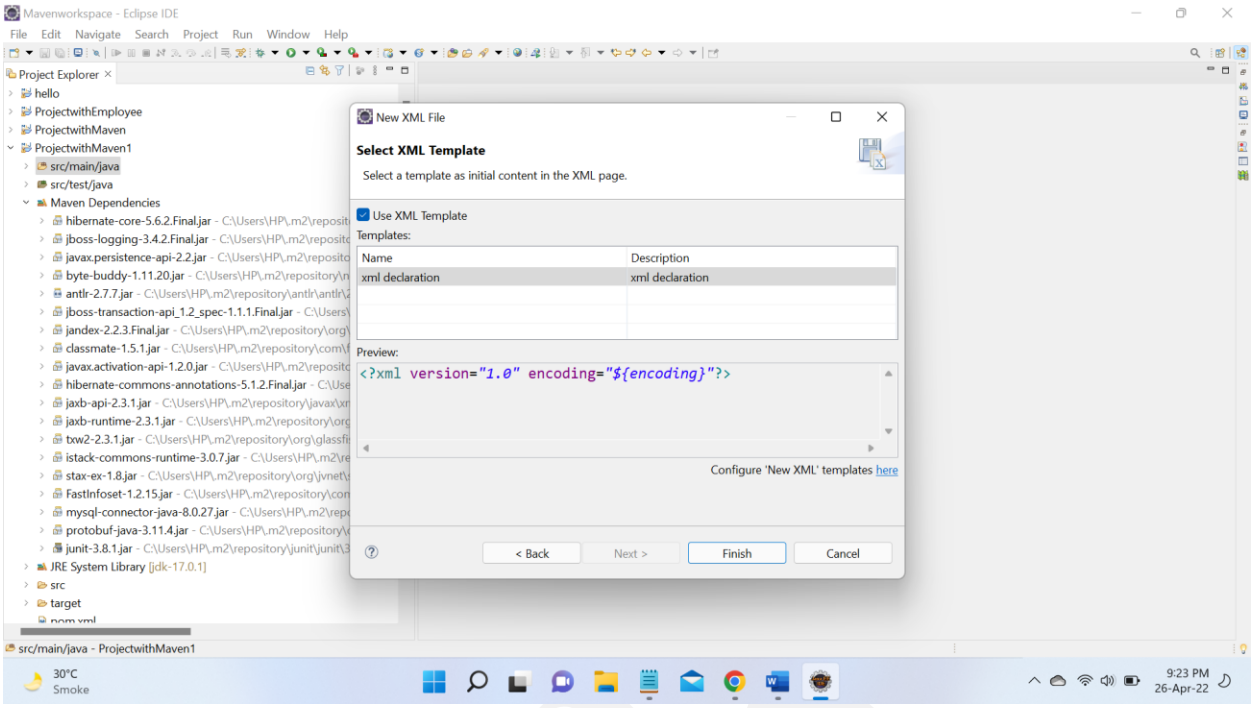


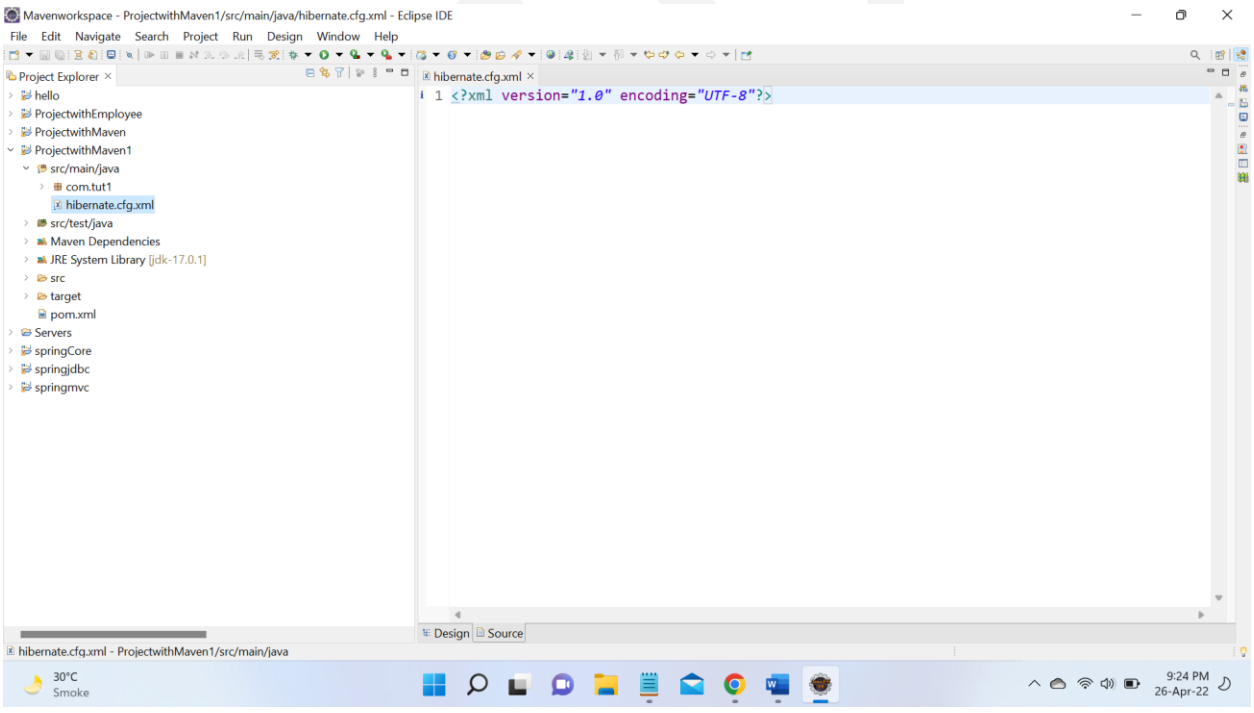

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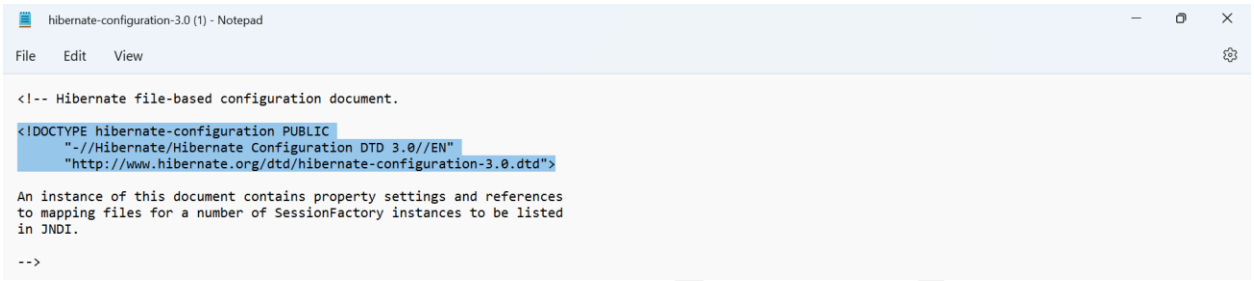
iii. Now browse to the website - https://hibernate.org/dtd/ and select hibernate-configuration-3.0.dtd , after clicking it will download automatically

iv. From downloaded DTD file, copy these lines & paste it on hibernate.cfg.xml file:




<!DOCTYPE hibernate-configuration PUBLIC

"-//Hibernate/Hibernate Configuration DTD 3.0//EN"

"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">

v. Now write further code for configuration in the file –

Like for Database, Image displaying and etc

3. **Write hibernate program to save student data using annotation**

**Code:**

**App.java:**

```
package com.tut;

import java.io.IOException;
import java.util.Date;

import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
import org.hibernate.cfg.Configuration;

/**
 * Hello world!
 *
 */
public class App {

	public static void main(String[] args) throws IOException {
		System.out.println("Project started..");
		Configuration cfg = new Configuration();
		cfg.configure("hibernate.cfg.xml");
		SessionFactory factory = cfg.buildSessionFactory();

		System.out.println(factory);

		// creating student
		Student st = new Student();
		st.setId(101);
		st.setName("Shibu");
		st.setCity("Mumbai");
		System.out.println(st);

		// create object of address class
		Address ad = new Address();
		ad.setStreet("strrt1");
		ad.setCity("Mumbai");
		ad.setOpen(true);
		ad.setAddedDate(new Date());
		ad.setX(1234);
```

```
		Session session = factory.openSession();
		Transaction tx = session.beginTransaction();
		session.save(st);

		session.save(ad);
		tx.commit();
		session.close();

		System.out.println("Done..");
	}
}
```

**Student.java:**

```
package com.tut;

import javax.persistence.Entity;
import javax.persistence.Id;

@Entity
public class Student {

	@Id
	private int id;
	private String name;
	private String city;

	public Student() {
		super();
		// TODO Auto-generated constructor stub
	}

	public Student(int id, String name, String city) {
		super();
		this.id = id;
		this.name = name;
		this.city = city;
	}

	public int getId() {
		return id;
	}
```

```
	public void setId(int id) {
		this.id = id;
	}

	public String getName() {
		return name;
	}

	public void setName(String name) {
		this.name = name;
	}

	public String getCity() {
		return city;
	}

	public void setCity(String city) {
		this.city = city;
	}

	@Override
	public String toString() {
		// TODO Auto-generated method stub
		return this.id + " :" + this.name + " : " + this.city;
	}

}
```

**Address.java:**

```
package com.tut;

import java.util.Date;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
import javax.persistence.Lob;
import javax.persistence.Table;
import javax.persistence.Temporal;
import javax.persistence.TemporalType;
import javax.persistence.Transient;
```

```
@Entity
@Table(name = "Student_Address")
public class Address {

	@Column(name = "addressId")
	@Id
	@GeneratedValue(strategy = GenerationType.IDENTITY)

	private int addressId;

	@Column(length = 50, name = "STREET")
	private String street;

	@Column(length = 100, name = "CITY")
	private String city;

	@Column(name = "is_open")
	private boolean isOpen;

	@Transient
	private double x;

	@Column(name = "added_time")
	@Temporal(TemporalType.DATE)
	private Date addedDate;

	@Lob
	private byte[] image;

	public Address() {
		super();
		// TODO Auto-generated constructor stub
	}

	public Address(int addressId, String street, String city, boolean isOpen, double x, Date
addedDate, byte[] image) {
		super();
		this.addressId = addressId;
		this.street = street;
		this.city = city;
		this.isOpen = isOpen;
		this.x = x;
		this.addedDate = addedDate;
		this.image = image;
	}
```

```
public int getAddressId() {
        return addressId;
}

public void setAddressId(int addressId) {
        this.addressId = addressId;
}

public String getStreet() {
        return street;
}

public void setStreet(String street) {
        this.street = street;
}

public String getCity() {
        return city;
}

public void setCity(String city) {
        this.city = city;
}

public boolean isOpen() {
        return isOpen;
}

public void setOpen(boolean isOpen) {
        this.isOpen = isOpen;
}

public double getX() {
        return x;
}

public void setX(double x) {
        this.x = x;
}

public Date getAddedDate() {
        return addedDate;
}

public void setAddedDate(Date addedDate) {
        this.addedDate = addedDate;
```

```
	}

	public byte[] getImage() {
		return image;
	}

	public void setImage(byte[] image) {
		this.image = image;
	}

}
```

**Hibernate.cfg.xml (CONFIGURATION FILE):**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
	"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
	"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">

<hibernate-configuration>
	<session-factory>
		<property name="connection.driver_class">com.mysql.cj.jdbc.Driver</property>
		<property
name="connection.url">jdbc:mysql://localhost:3306/myhiber01</property>
		<property name="connection.username">root</property>
		<property name="connection.password">shibu@ninja</property>
		<property name="dialect">org.hibernate.dialect.MySQL5Dialect</property>
		<property name="hbm2ddl.auto">create</property>
		<property name="show_sql">true</property>

		<mapping class="com.tut.Student" />
		<mapping class="com.tut.Address" />

	</session-factory>
</hibernate-configuration>
```

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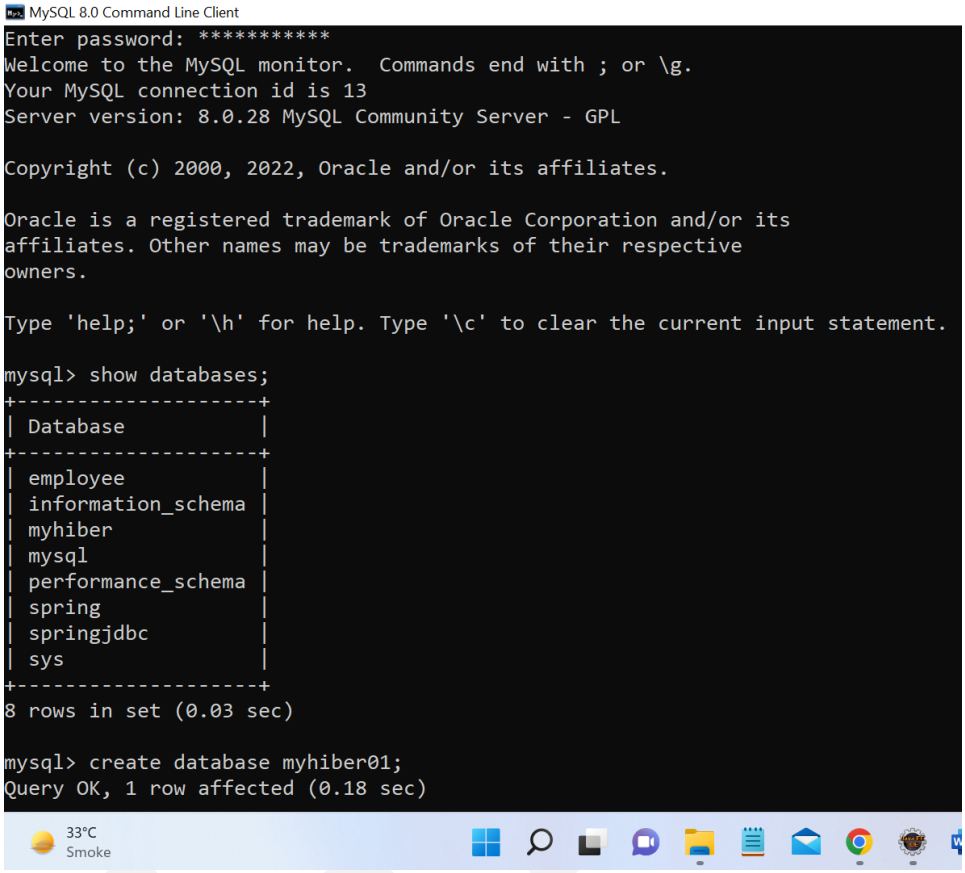
**Pom.xml:**

```
<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.tut</groupId>
	<artifactId>ProjectwithMaven</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>ProjectwithMaven</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.hibernate/hibernate-core -->
		<dependency>
			<groupId>org.hibernate</groupId>
			<artifactId>hibernate-core</artifactId>
			<version>5.6.2.Final</version>
		</dependency>


		<!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
		<dependency>
			<groupId>mysql</groupId>
			<artifactId>mysql-connector-java</artifactId>
			<version>8.0.27</version>
		</dependency>


		<dependency>
			<groupId>junit</groupId>
			<artifactId>junit</artifactId>
			<version>3.8.1</version>
			<scope>test</scope>
		</dependency>
	</dependencies>
</project>
```

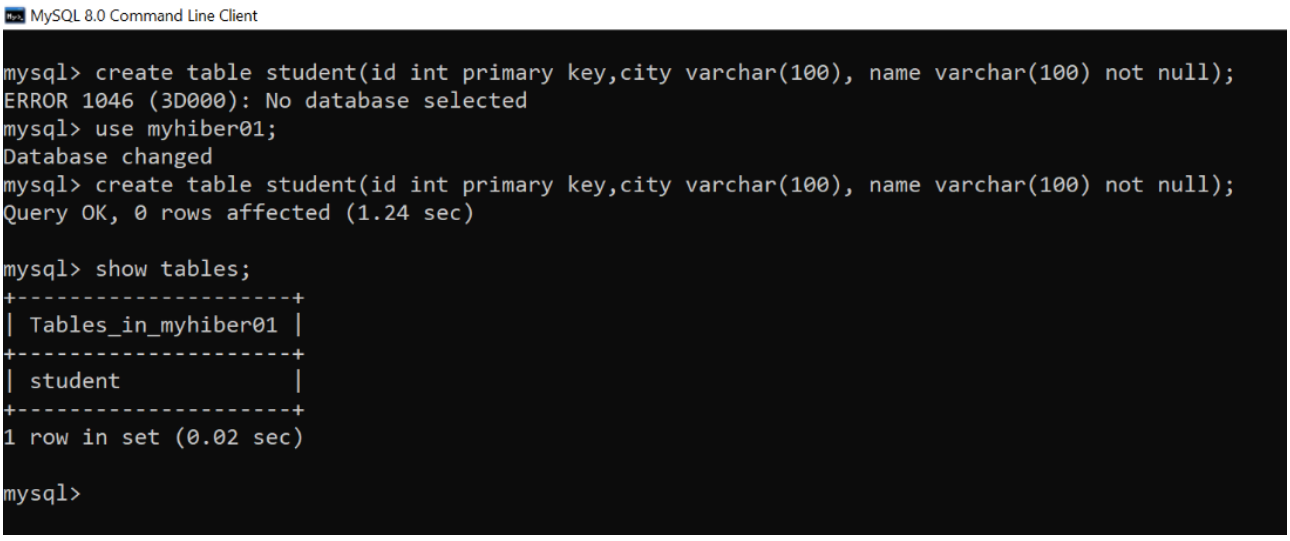
Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

## MySQL Database:

### Step 1: Create database




### Step 2: Create table student



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**Step 3: Create table student_address;**

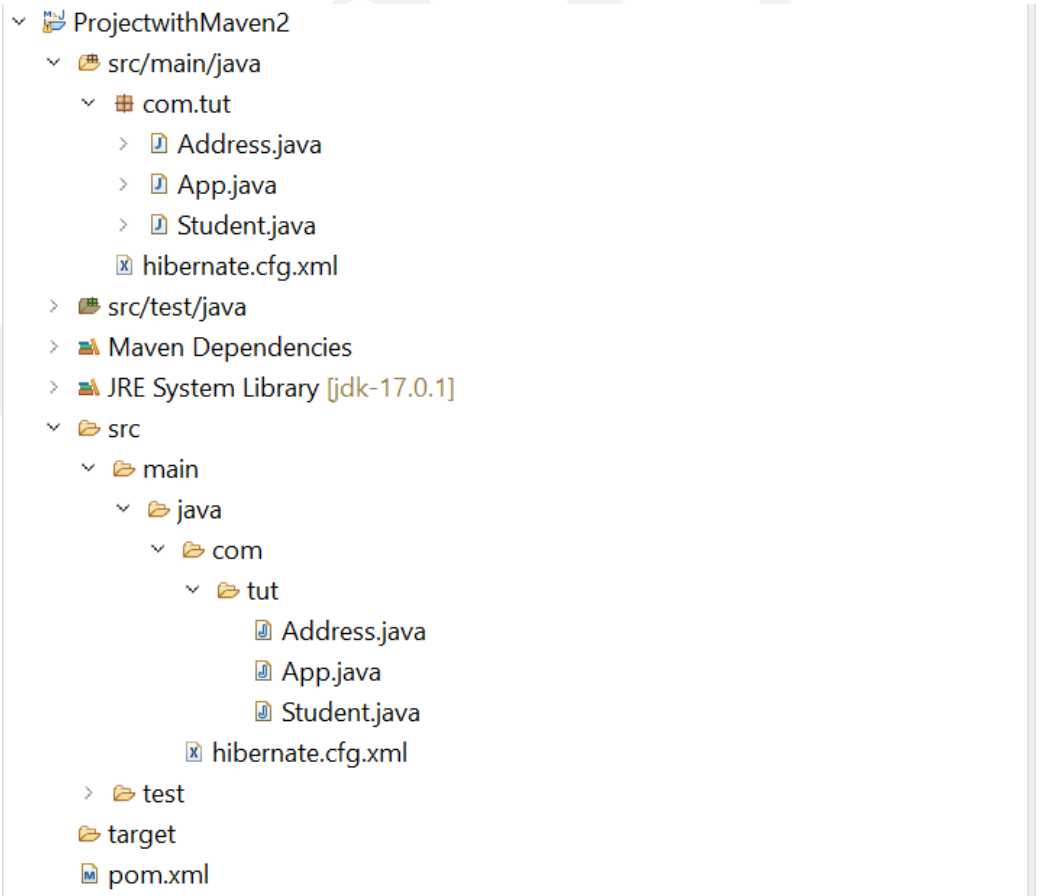
```
mysql> create table student_address(adrressId int primary key, added_time date, CITY varchar(100), image longblob, is_open bit(1), STREET varchar
(50));
Query OK, 0 rows affected (0.93 sec)

mysql> desc student_address;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| adrressId  | int          | NO   | PRI | NULL    |       |
| added_time | date         | YES  |     | NULL    |       |
| CITY       | varchar(100) | YES  |     | NULL    |       |
| image      | longblob     | YES  |     | NULL    |       |
| is_open    | bit(1)       | YES  |     | NULL    |       |
| STREET     | varchar(50)  | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
6 rows in set (0.29 sec)

mysql>
```

**Now the database and the tables have been created, switch back to Eclipse and run App.java (run java application) to display the output.**

**Eclipse Output:**



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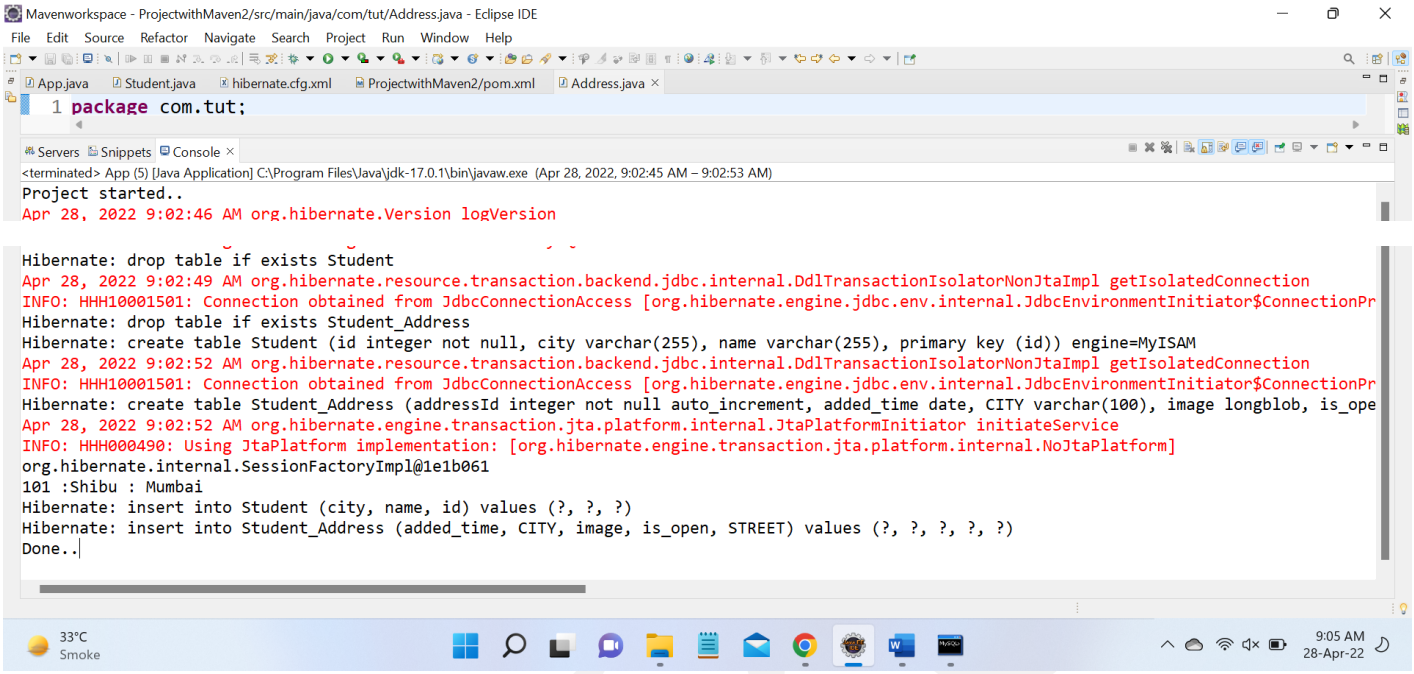
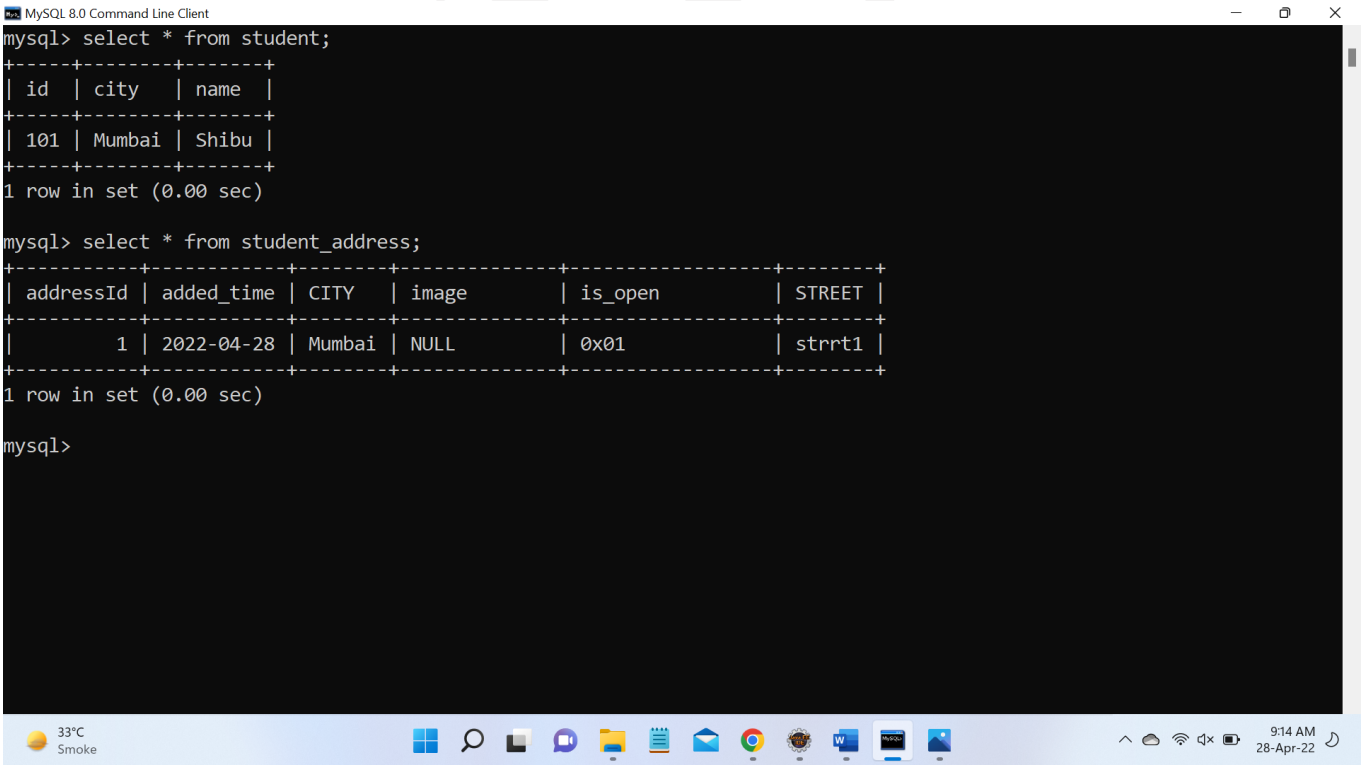



## MySQL Output:



4. **Write hibernate program to save image in database**

**Code:**

**App.java:**

```
package com.tut;

import java.io.FileInputStream;
import java.io.IOException;
import java.util.Date;

import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
import org.hibernate.cfg.Configuration;

/**
 * Hello world!
 *
 */
public class App {

	public static void main(String[] args) throws IOException {
		System.out.println("Project started..");
		Configuration cfg = new Configuration();
		cfg.configure("hibernate.cfg.xml");
		SessionFactory factory = cfg.buildSessionFactory();

		System.out.println(factory);

		// creating student
		Student st = new Student();
		st.setId(101);
		st.setName("Shibu");
		st.setCity("Mumbai");
		System.out.println(st);

		// create object of address class
		Address ad = new Address();
		ad.setStreet("strrt1");
		ad.setCity("Mumbai");
		ad.setOpen(true);
		ad.setAddedDate(new Date());
		ad.setX(1234);
```

```
                // reading an image
                FileInputStream fis = new FileInputStream("src/main/java/pic.jpeg");
                byte[] data = new byte[fis.available()];
                fis.read(data);
                ad.setImage(data);

                Session session = factory.openSession();
                Transaction tx = session.beginTransaction();
                session.save(st);

                session.save(ad);
                tx.commit();
                session.close();

                System.out.println("Done..");
        }
}
```

**Student.java:**

```
package com.tut;

import javax.persistence.Entity;
import javax.persistence.Id;

@Entity
public class Student {

        @Id
        private int id;
        private String name;
        private String city;

        public Student() {
                super();
                // TODO Auto-generated constructor stub
        }

        public Student(int id, String name, String city) {
                super();
                this.id = id;
                this.name = name;
                this.city = city;
        }
```

```
	public int getId() {
		return id;
	}

	public void setId(int id) {
		this.id = id;
	}

	public String getName() {
		return name;
	}

	public void setName(String name) {
		this.name = name;
	}

	public String getCity() {
		return city;
	}

	public void setCity(String city) {
		this.city = city;
	}

	@Override
	public String toString() {
		// TODO Auto-generated method stub
		return this.id + " :" + this.name + " : " + this.city;
	}

}
```

**Adrress.java:**

```
package com.tut;

import java.util.Date;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.GenerationType;
import javax.persistence.Id;
```

```
import javax.persistence.Lob;
import javax.persistence.Table;
import javax.persistence.Temporal;
import javax.persistence.TemporalType;
import javax.persistence.Transient;

@Entity
@Table(name = "Student_Address")
public class Address {

	@Column(name = "addressId")
	@Id
	@GeneratedValue(strategy = GenerationType.IDENTITY)

	private int addressId;

	@Column(length = 50, name = "STREET")
	private String street;

	@Column(length = 100, name = "CITY")
	private String city;

	@Column(name = "is_open")
	private boolean isOpen;

	@Transient
	private double x;

	@Column(name = "added_time")
	@Temporal(TemporalType.DATE)
	private Date addedDate;

	@Lob
	private byte[] image;

	public Address() {
		super();
		// TODO Auto-generated constructor stub
	}

	public Address(int addressId, String street, String city, boolean isOpen, double x, Date
addedDate, byte[] image) {
		super();
		this.addressId = addressId;
		this.street = street;
		this.city = city;
```

```
        this.isOpen = isOpen;
        this.x = x;
        this.addedDate = addedDate;
        this.image = image;
}

public int getAddressId() {
        return addressId;
}

public void setAddressId(int addressId) {
        this.addressId = addressId;
}

public String getStreet() {
        return street;
}

public void setStreet(String street) {
        this.street = street;
}

public String getCity() {
        return city;
}

public void setCity(String city) {
        this.city = city;
}

public boolean isOpen() {
        return isOpen;
}

public void setOpen(boolean isOpen) {
        this.isOpen = isOpen;
}

public double getX() {
        return x;
}

public void setX(double x) {
        this.x = x;
}
```

```
	public Date getAddedDate() {
		return addedDate;
	}

	public void setAddedDate(Date addedDate) {
		this.addedDate = addedDate;
	}

	public byte[] getImage() {
		return image;
	}

	public void setImage(byte[] image) {
		this.image = image;
	}

}
```

**Hibernate.cfg.xml (CONFIGURATION FILE):**

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
	"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
	"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">

<hibernate-configuration>
	<session-factory>
		<property name="connection.driver_class">com.mysql.cj.jdbc.Driver</property>
		<property
name="connection.url">jdbc:mysql://localhost:3306/myhiber</property>
		<property name="connection.username">root</property>
		<property name="connection.password">shibu@ninja</property>
		<property name="dialect">org.hibernate.dialect.MySQL5Dialect</property>
		<property name="hbm2ddl.auto">create</property>
		<property name="show_sql">true</property>

		<mapping class="com.tut.Student" />
		<mapping class="com.tut.Address" />

	</session-factory>
</hibernate-configuration>
```

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**Pom.xml:**

```
<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.tut</groupId>
	<artifactId>ProjectwithMaven</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>ProjectwithMaven</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.hibernate/hibernate-core -->
		<dependency>
			<groupId>org.hibernate</groupId>
			<artifactId>hibernate-core</artifactId>
			<version>5.6.2.Final</version>
		</dependency>


		<!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
		<dependency>
			<groupId>mysql</groupId>
			<artifactId>mysql-connector-java</artifactId>
			<version>8.0.27</version>
		</dependency>


		<dependency>
			<groupId>junit</groupId>
			<artifactId>junit</artifactId>
			<version>3.8.1</version>
			<scope>test</scope>
		</dependency>
	</dependencies>
</project>
```

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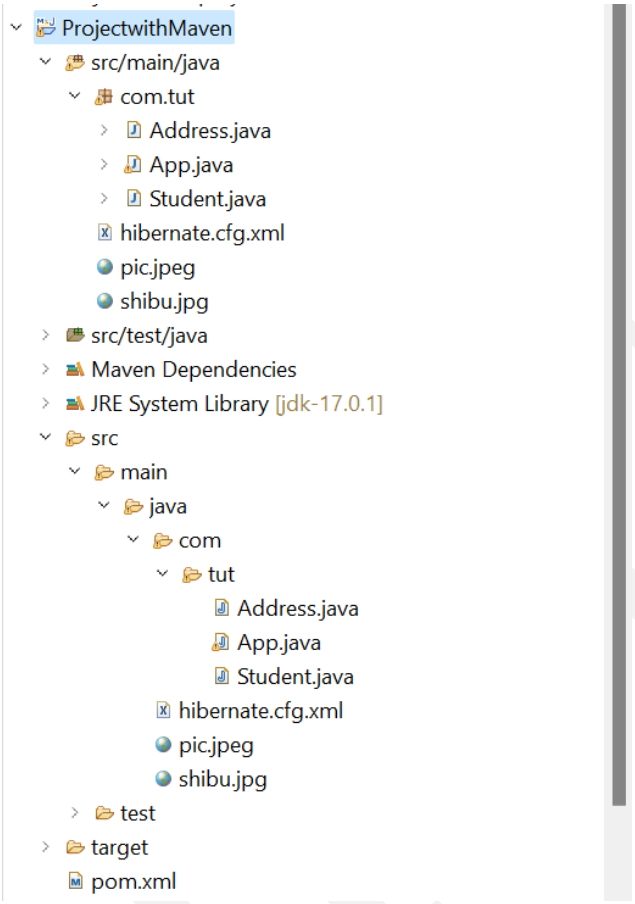
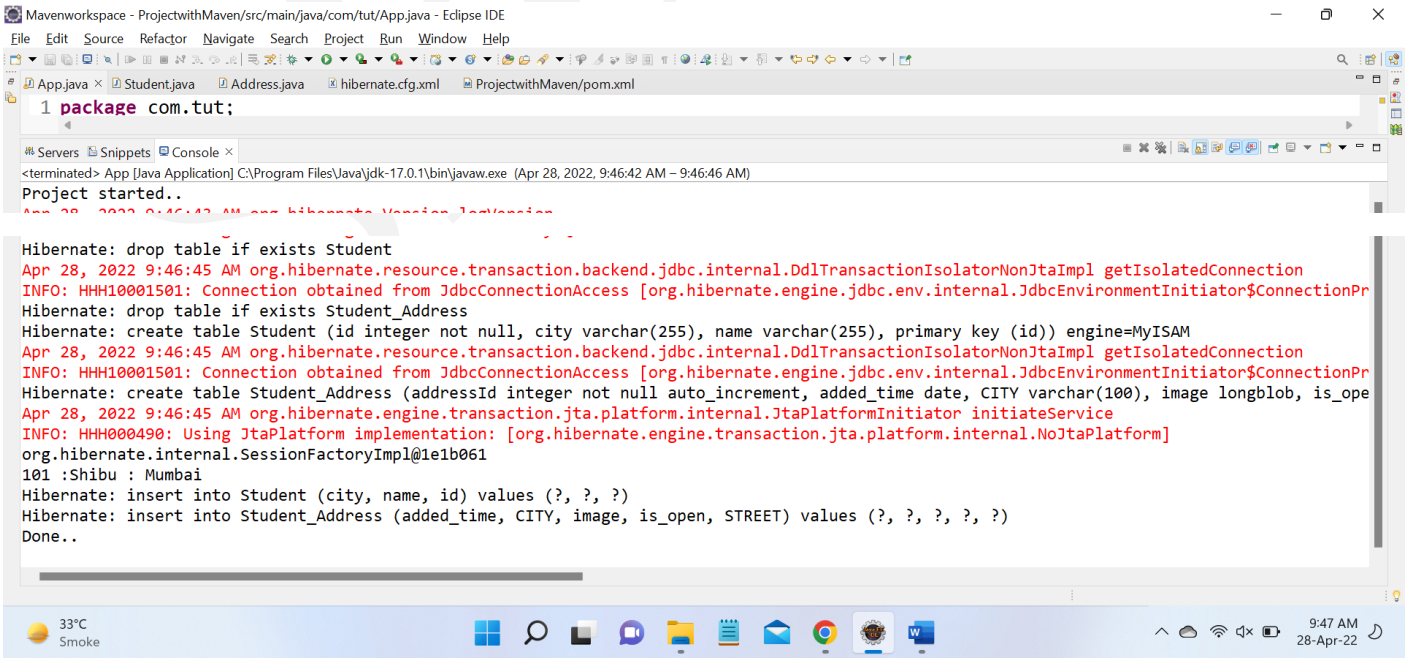
**Eclipse Output:**



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**MySQL Database Output:**

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| employee           |
| information_schema |
| myhiber            |
| myhiber01          |
| mysql              |
| performance_schema |
| spring             |
| springjdbc         |
| sys                |
+--------------------+
```

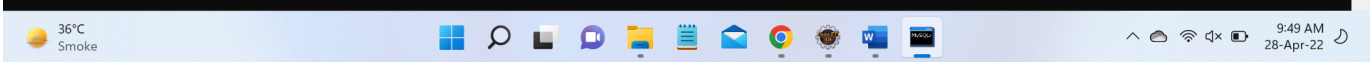

Select MySQL 8.0 Command Line Client

```
9 rows in set (0.08 sec)

mysql> use myhiber;
Database changed
mysql> show tables;
+------------------+
| Tables_in_myhiber |
+------------------+
| student          |
| student_address  |
+------------------+
2 rows in set (0.04 sec)

mysql> select * from student;
+-----+--------+-------+
| id  | city   | name  |
+-----+--------+-------+
| 101 | Mumbai | Shibu |
+-----+--------+-------+
1 row in set (0.00 sec)

mysql> select * from student_address;
+----------+-----------+--------+-----------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------------------------
```



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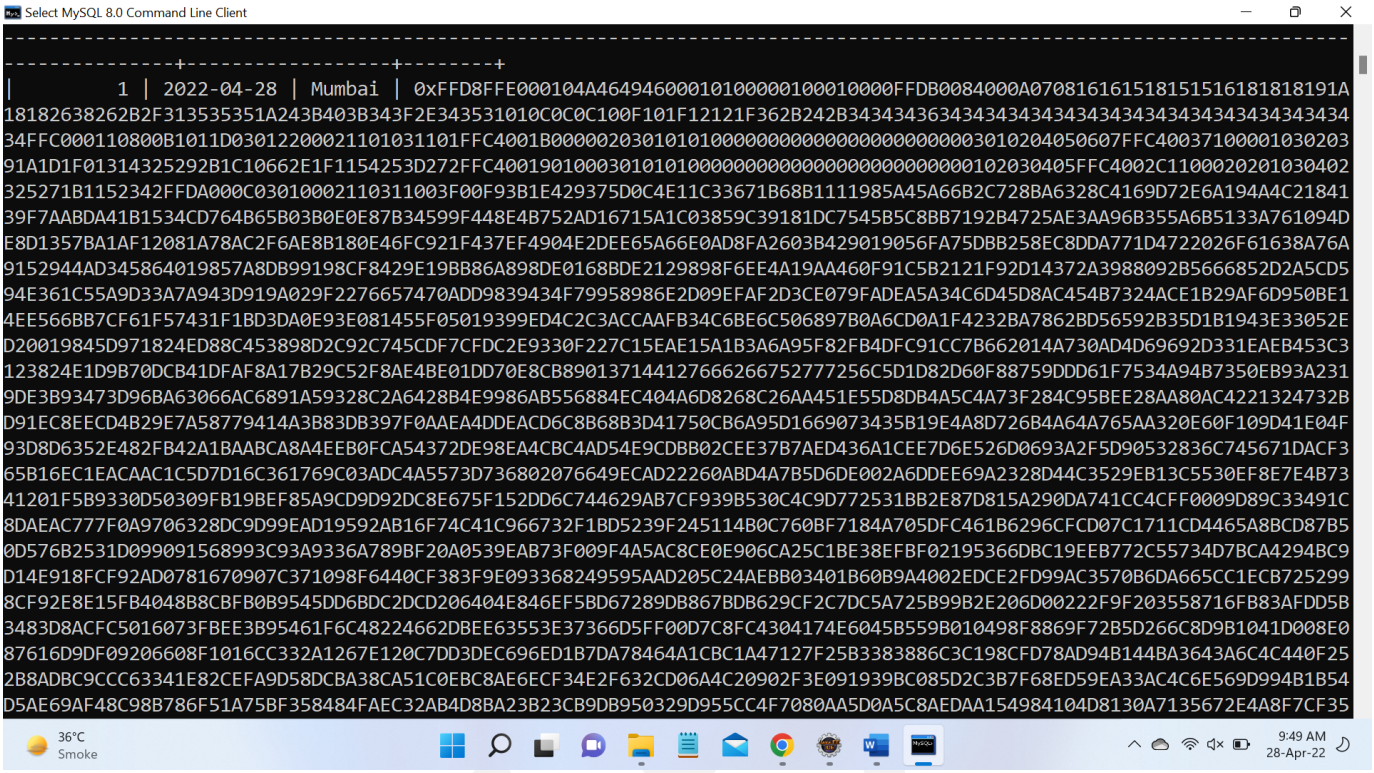

Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

# SPRING

1. **Create new Maven Project to add Spring Dependencies using setter injection.**

**Code:**

**Config.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns:context="http://www.springframework.org/schema/context"
	xmlns:p="http://www.springframework.org/schema/p"

	xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">


	<!-- this is for bean -->

	<bean class="com.springCore.Student" name="student1">


		<!-- first way by using element tags -->

		<property name="studentId">
			<value>101</value>
		</property>

		<property name="studentName">
			<value>Shibu</value>
		</property>

		<property name="studentAddress">
			<value>California</value>
		</property>

	</bean>
</beans>
```

Name: **Shibu Mohapatra** Branch: **MSC AI** Roll no: **02**

**App.java:**

```
package com.springCore;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

/**
 * Hello world!
 *
 */
public class App
{
    public static void main( String[] args )
    {
        System.out.println( "Hello World!" );


        ApplicationContext context = new ClassPathXmlApplicationContext("config.xml");
        Student student1 = (Student)context.getBean("student1");
        System.out.println(student1);
    }
}
```

**Student.java:**

```
package com.springCore;

public class Student {

        private int studentId;
        private String studentName;
        private String studentAddress;


        public int getStudentId() {
                return studentId;
        }
        public void setStudentId(int studentId) {
                System.out.println("Setter ID");
                this.studentId = studentId;
        }
```

```
	public String getStudentName() {
		return studentName;
	}
	public void setStudentName(String studentName) {
		System.out.println("Setter Name");
		this.studentName = studentName;
	}
	public String getStudentAddress() {
		return studentAddress;
	}
	public void setStudentAddress(String studentAddress) {
		System.out.println("Setter Address");
		this.studentAddress = studentAddress;
	}

	public Student(int studentId, String studentName, String studentAddress) {
		super();
		this.studentId = studentId;
		this.studentName = studentName;
		this.studentAddress = studentAddress;
	}
	public Student() {
		super();
		// TODO Auto-generated constructor stub
	}

	@Override
	public String toString() {
		return "Student [studentId=" + studentId + ", studentName=" + studentName + ",
studentAddress=" + studentAddress
				+ "]";
	}
}
```

**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
```

```
    <version>0.0.1-SNAPSHOT</version>
    <packaging>jar</packaging>

    <name>springCore</name>
    <url>http://maven.apache.org</url>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>

    <dependencies>

        <!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-core</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>3.8.1</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
</project>
```

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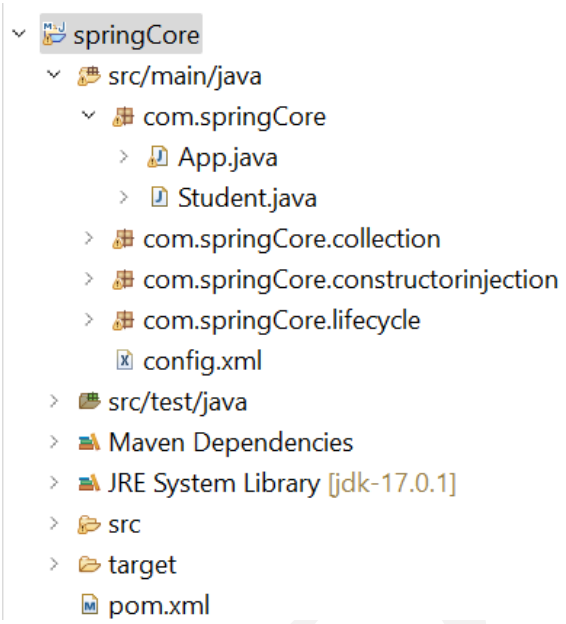
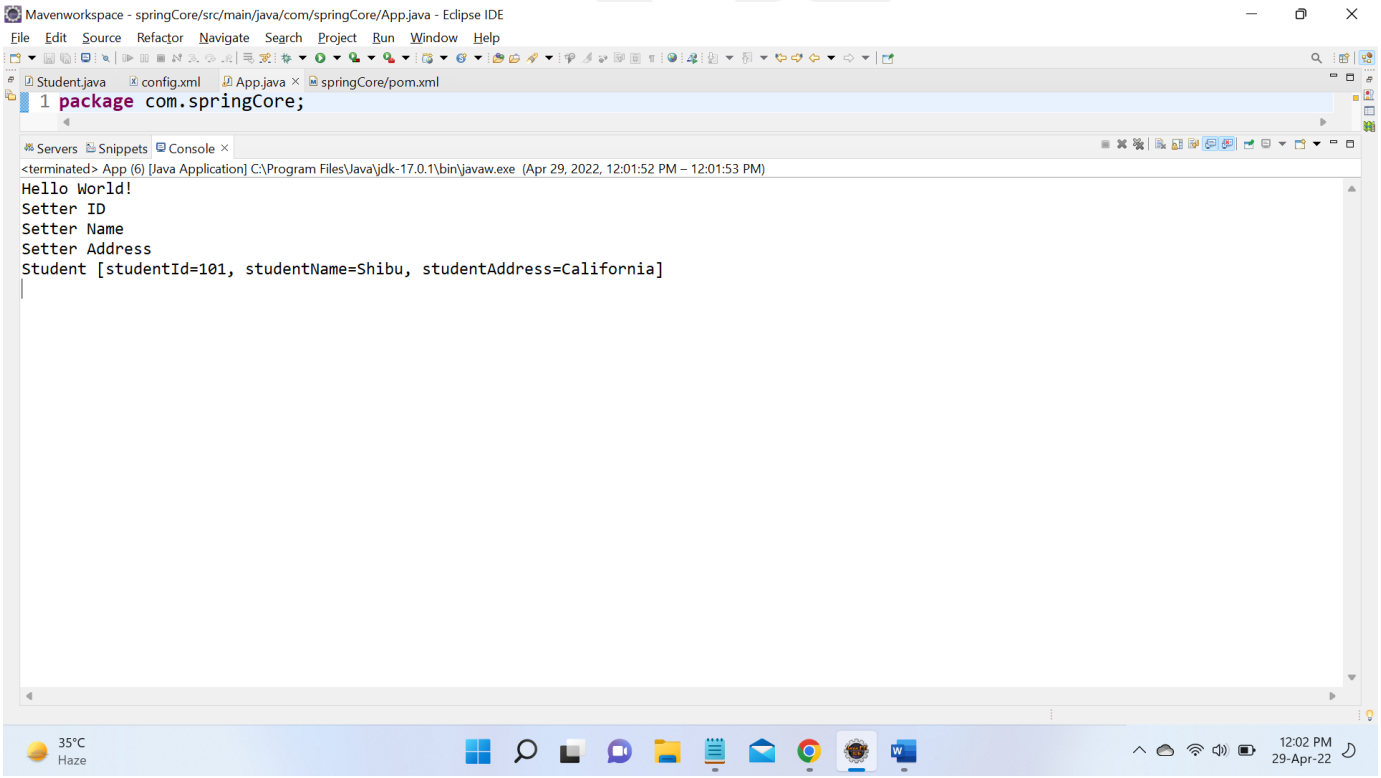
**Output:**



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2. **Create new Maven Project for property injection using p Schema and using value as attribute**

**P Schema**

**Code:**

**Config.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:context="http://www.springframework.org/schema/context"
        xmlns:p="http://www.springframework.org/schema/p"

        xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">


        <!-- this is for bean -->

        <!-- using P schema -->

        <bean class="com.springCore.Student" name="student1"
                p:studentId="1001" p:studentName="Mohapatra" p:studentAddress="Mumbai">

        </bean>
</beans>
```

**App.java:**

```
package com.springCore;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

/**
 * Hello world!
 *
```

```
 */
public class App
{
   public static void main( String[] args )
   {


      ApplicationContext context = new ClassPathXmlApplicationContext("config.xml");
      Student student1 = (Student)context.getBean("student1");
      System.out.println(student1);
   }
}
```

**Student.java:**

```
package com.springCore;

public class Student {

        private int studentId;
        private String studentName;
        private String studentAddress;


        public int getStudentId() {
                return studentId;
        }
        public void setStudentId(int studentId) {
                System.out.println("Setter ID");
                this.studentId = studentId;
        }
        public String getStudentName() {
                return studentName;
        }
        public void setStudentName(String studentName) {
                System.out.println("Setter Name");
                this.studentName = studentName;
        }
        public String getStudentAddress() {
                return studentAddress;
        }
        public void setStudentAddress(String studentAddress) {
                System.out.println("Setter Address");
```

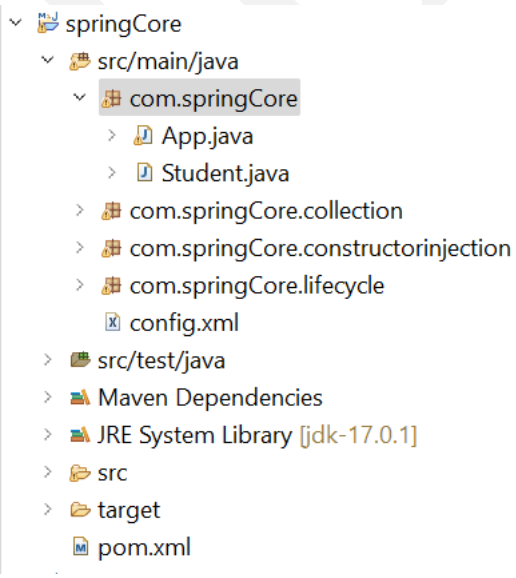
```
		this.studentAddress = studentAddress;
	}

	public Student(int studentId, String studentName, String studentAddress) {
		super();
		this.studentId = studentId;
		this.studentName = studentName;
		this.studentAddress = studentAddress;
	}
	public Student() {
		super();
		// TODO Auto-generated constructor stub
	}

	@Override
	public String toString() {
		return "Student [studentId=" + studentId + ", studentName=" + studentName + ",
studentAddress=" + studentAddress
				+ "]";
	}
}
```

**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springCore</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
```

```
            <groupId>org.springframework</groupId>
            <artifactId>spring-core</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>3.8.1</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
</project>
```

**Output:**



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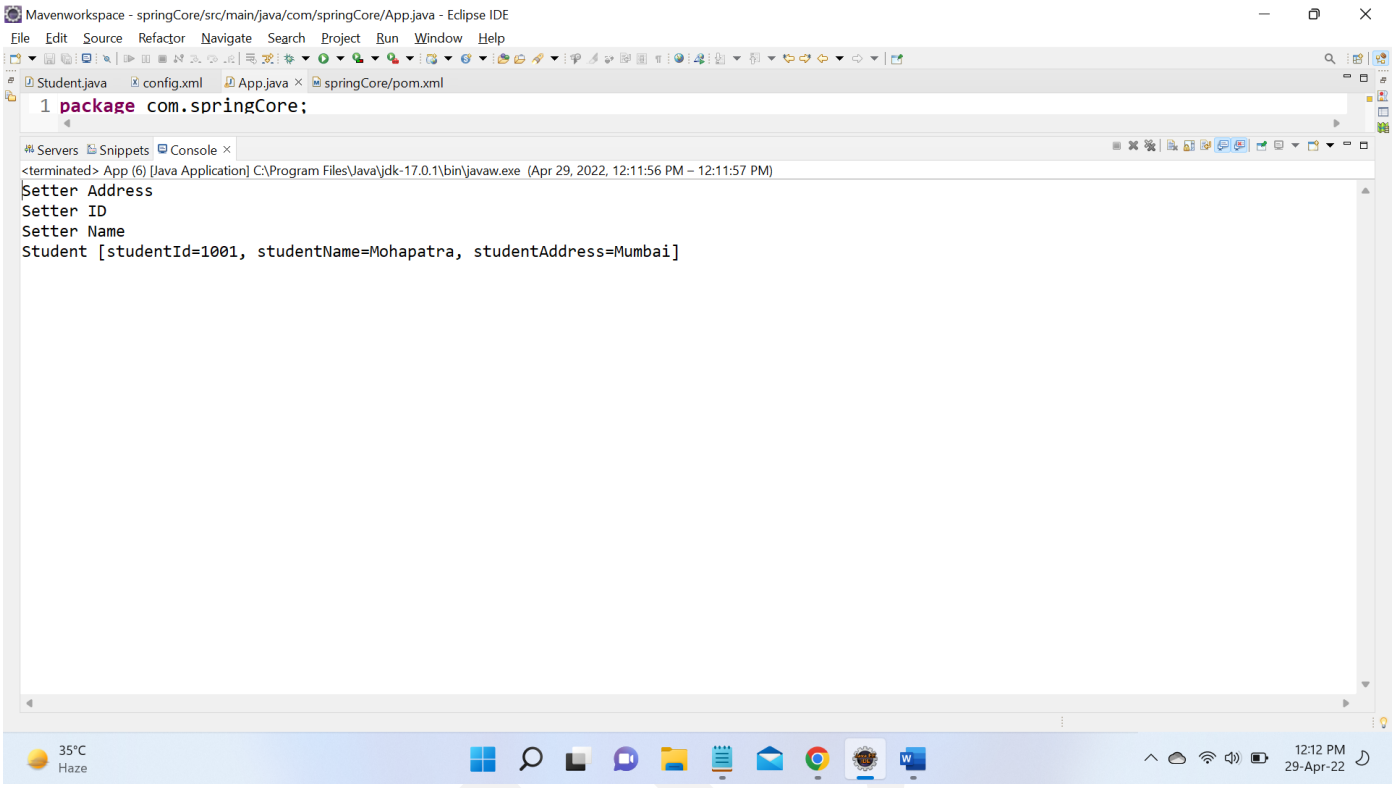

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## Value as Attribute

**CODE:**

**Config.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns:context="http://www.springframework.org/schema/context"
	xmlns:p="http://www.springframework.org/schema/p"

	xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">


	<!-- this is for bean -->

	<!-- Using attribute value -->

	<bean class="com.springCore.Student" name="student1">
		<property name="studentId" value="202" />
		<property name="studentName" value="Shivaay" />
		<property name="studentAddress" value="London" />
	</bean>

</beans>
```

**App.java:**

```
package com.springCore;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

/**
 * Hello world!
 *
 */
```

```
public class App
{
   public static void main( String[] args )
   {


      ApplicationContext context = new ClassPathXmlApplicationContext("config.xml");
      Student student1 = (Student)context.getBean("student1");
      System.out.println(student1);
   }
}
```

**Student.java:**

```
package com.springCore;

public class Student {

        private int studentId;
        private String studentName;
        private String studentAddress;


        public int getStudentId() {
                return studentId;
        }
        public void setStudentId(int studentId) {
                System.out.println("Setter ID");
                this.studentId = studentId;
        }
        public String getStudentName() {
                return studentName;
        }
        public void setStudentName(String studentName) {
                System.out.println("Setter Name");
                this.studentName = studentName;
        }
        public String getStudentAddress() {
                return studentAddress;
        }
        public void setStudentAddress(String studentAddress) {
                System.out.println("Setter Address");
                this.studentAddress = studentAddress;
```

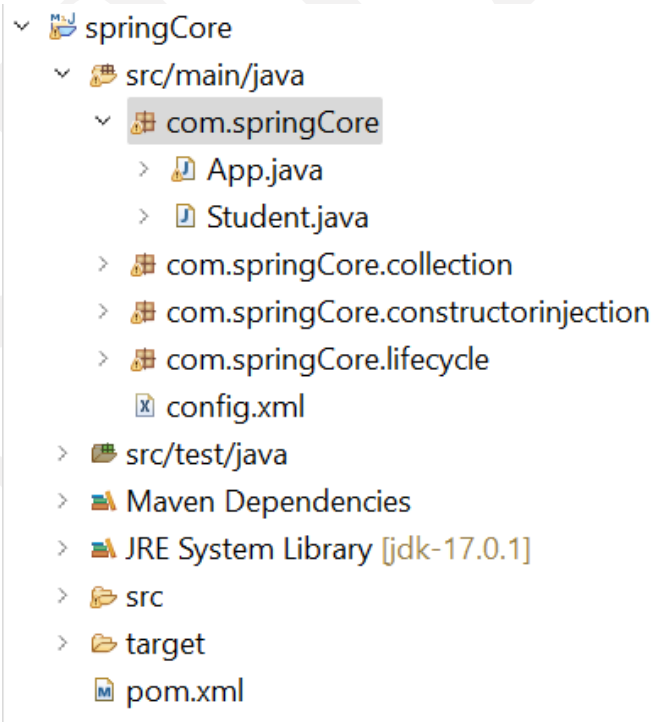
```
	}

	public Student(int studentId, String studentName, String studentAddress) {
		super();
		this.studentId = studentId;
		this.studentName = studentName;
		this.studentAddress = studentAddress;
	}
	public Student() {
		super();
		// TODO Auto-generated constructor stub
	}

	@Override
	public String toString() {
		return "Student [studentId=" + studentId + ", studentName=" + studentName + ",
studentAddress=" + studentAddress
				+ "]";
	}
}
```

**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springCore</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-core</artifactId>
```

```
            <version>5.2.3.RELEASE</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>3.8.1</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
</project>
```

**Output:**



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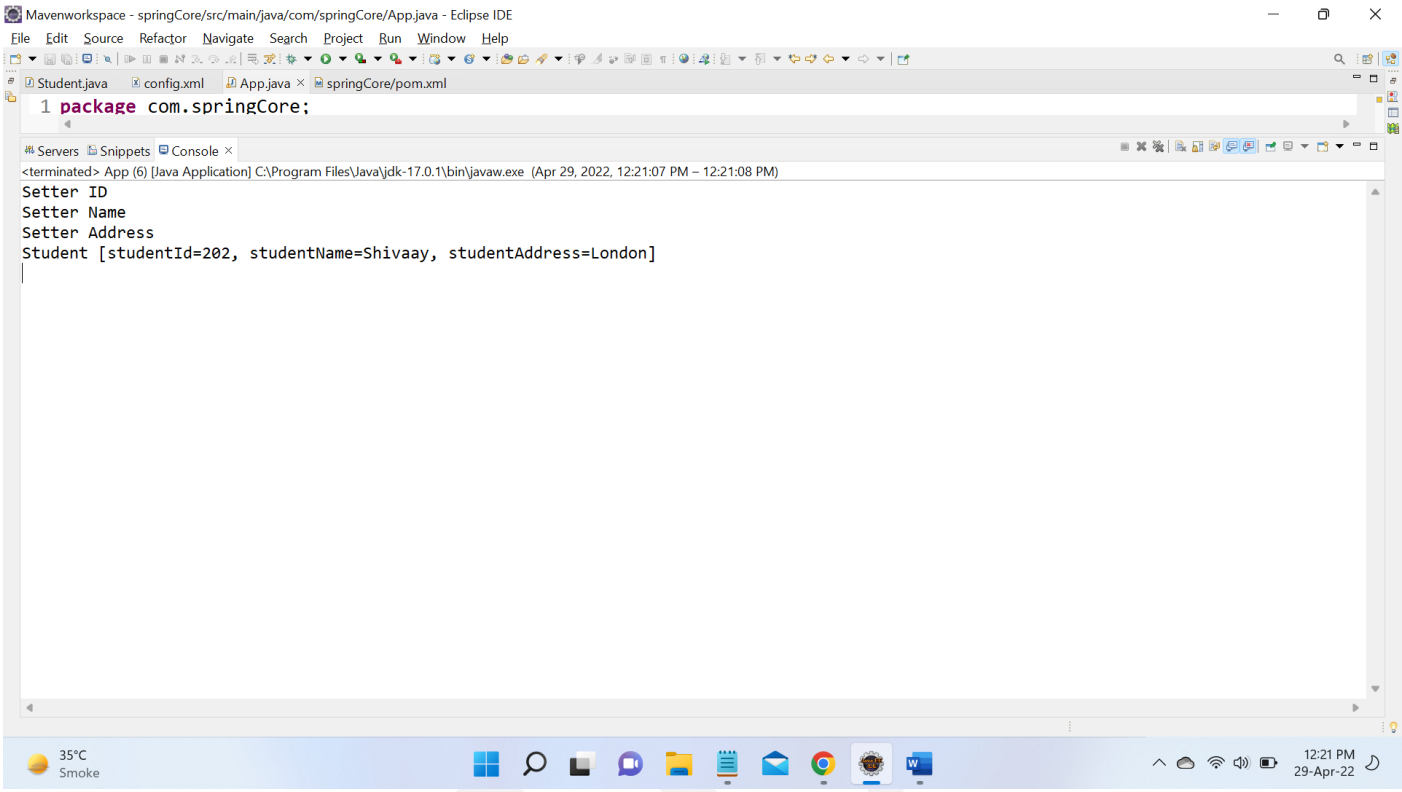

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3. **Create project to implement injecting collection types: List, Set Map and Properties.**

**Code:**

**Collectionconfig.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns:context="http://www.springframework.org/schema/context"
	xmlns:p="http://www.springframework.org/schema/p"

	xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">

	<!-- this is for bean -->

	<bean name="emp1" class="com.springCore.collection.Emp">
		<property name="name" value="Shibu" />

		<!-- LIST -->
		<property name="phones">
			<list>
				<value>1234567890</value>
				<value>8208213211</value>
				<value>8271639576</value>
			</list>
		</property>

		<!-- SET -->
		<property name="address">
			<set>
				<value>Mumbai</value>
				<value>New York</value>
				<value>London</value>
			</set>
		</property>

		<!-- MAP -->
		<property name="courses">
			<map>
				<entry key="Java" value="2months" />
```

```
                        <entry key="Python" value="2months" />
                        <entry key="NLP" value="3months" />
                    </map>
                </property>

                <!-- Properties -->
                <property name="info">
                    <props>
                        <prop key="name">Shibu Mohapatra</prop>
                        <prop key="subject">DIP</prop>
                    </props>
                </property>

        </bean>
</beans>
```

**Test.java:**

```
package com.springCore.collection;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;

public class Test {

        public static void main(String[] args) {
                ApplicationContext context = new ClassPathXmlApplicationContext(
                                "/com/springCore/collection/collectionconfig.xml");

                Emp emp1 = (Emp) context.getBean("emp1");
                System.out.println(emp1.getName());
                System.out.println(emp1.getPhones());
                System.out.println(emp1.getAddress());
                System.out.println(emp1.getCourses());

                System.out.println(emp1.getInfo());
        }
}
```

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**Emp.java:**

```
//how to inject collection type List, Set, Map and properties in spring

package com.springCore.collection;

import java.util.List;
import java.util.Map;
import java.util.Set;
import java.util.Properties;

public class Emp {
	private String name;
	private List<String> phones;
	private Set<String> address;
	private Map<String, String> courses;
	private Properties info;

	public Emp() {
		super();
		// TODO Auto-generated constructor stub
	}
	public Emp(String name, List<String> phones, Set<String> address, Map<String,
String> courses, Properties info) {
		super();
		this.name = name;
		this.phones = phones;
		this.address = address;
		this.courses = courses;
		this.info = info;
	}
	public String getName() {
		return name;
	}
	public void setName(String name) {
		this.name = name;
	}
	public List<String> getPhones() {
		return phones;
	}
	public void setPhones(List<String> phones) {
		this.phones = phones;
	}
	public Set<String> getAddress() {
		return address;
```

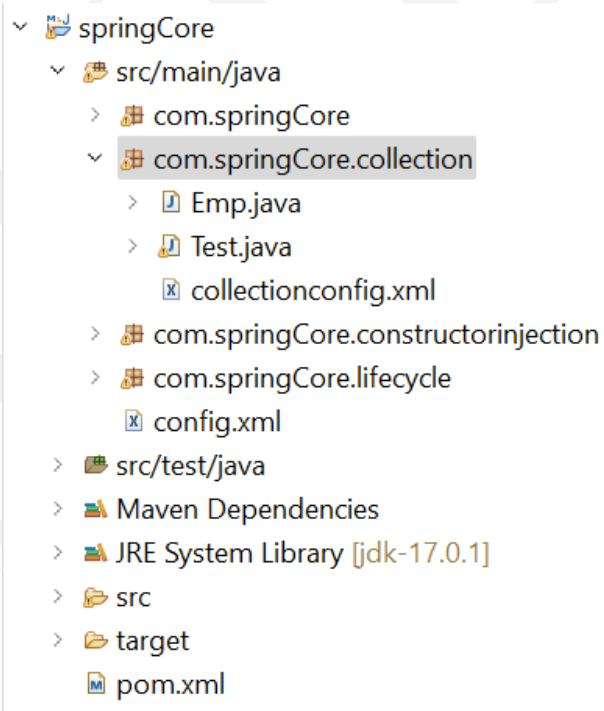
```
	}
	public void setAddress(Set<String> address) {
		this.address = address;
	}
	public Map<String, String> getCourses() {
		return courses;
	}
	public void setCourses(Map<String, String> courses) {
		this.courses = courses;
	}
	public Properties getInfo() {
		return info;
	}
	public void setInfo(Properties info) {
		this.info = info;
	}
}
```

**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springCore</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-core</artifactId>
```

```
            <version>5.2.3.RELEASE</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-context</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>3.8.1</version>
            <scope>test</scope>
        </dependency>
    </dependencies>
</project>
```

**Output:**



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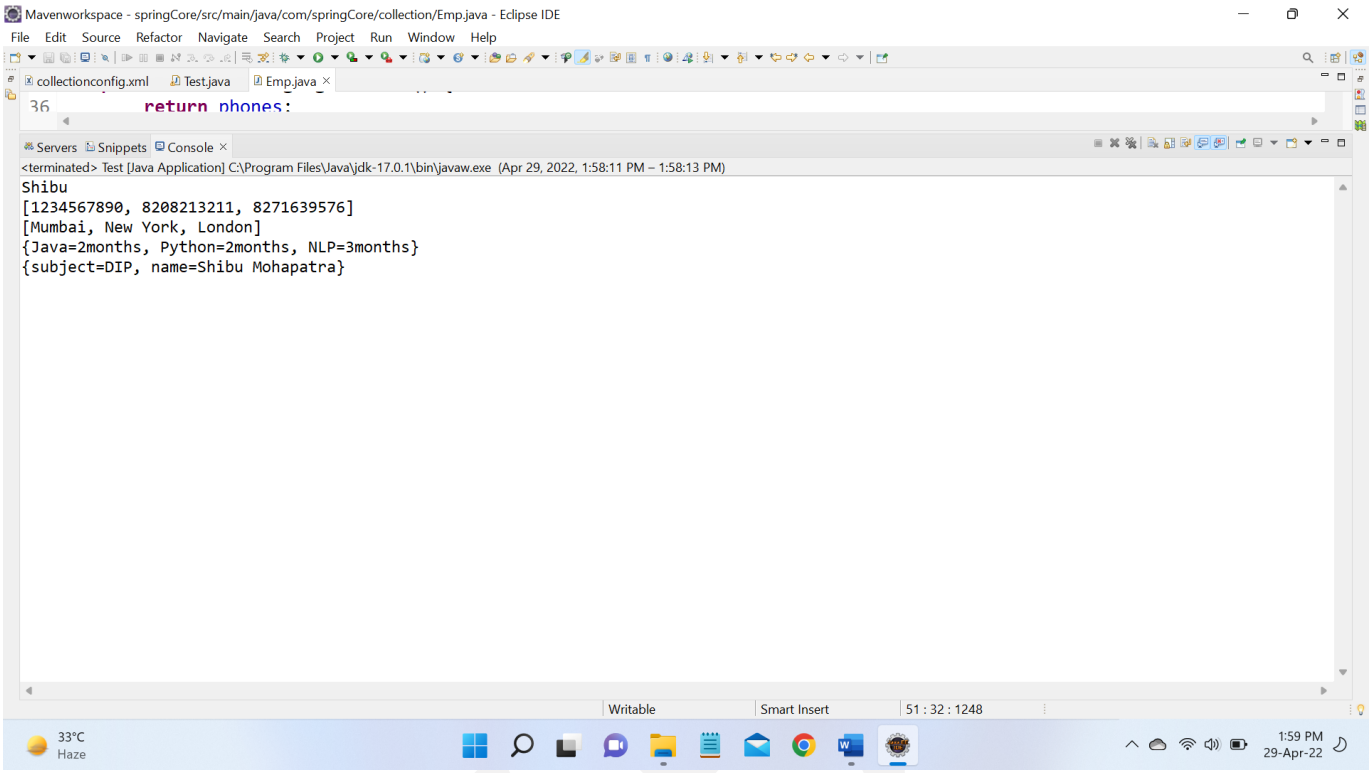

4. **Create project to implement constructor injection**

**Code:**

**ciconfig.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns:context="http://www.springframework.org/schema/context"
	xmlns:p="http://www.springframework.org/schema/p"

	xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">

	<!-- using constructor injection -->
	<bean class="com.springCore.constructorinjection.Person"
		name="person">

		<!-- using constructor as element -->
		<constructor-arg>
			<value>Shibu</value>
		</constructor-arg>

		<!-- using constructor as attribute -->
		<!-- <constructor-arg value = "Shiv" /> -->

		<!-- <constructor-arg> <value>10</value> </constructor-arg> -->
		<constructor-arg value="10" type="int" />
	</bean>

</beans>
```

**Test.java:**

```
package com.springCore.constructorinjection;


import org.springframework.context.ApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;
```

```
public class Test {


	public static void main(String[] args) {
		// TODO Auto-generated method stub


		ApplicationContext context = new
ClassPathXmlApplicationContext("com/springCore/constructorinjection/ciconfig.xml");
		Person p = (Person)context.getBean("person");


		System.out.println(p);


	}


}
```

**Person.java:**

```
package com.springCore.constructorinjection;

public class Person {
	private String name;
	private int personId;

	public Person(String name, int personId) {
		this.name = name;
		this.personId = personId;
	}

	@Override
	public String toString() {
		return this.name + " : " + this.personId;

	}

}
```

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**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springCore</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-core</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-context</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<dependency>
			<groupId>junit</groupId>
			<artifactId>junit</artifactId>
			<version>3.8.1</version>
			<scope>test</scope>
		</dependency>
	</dependencies>
</project>
```

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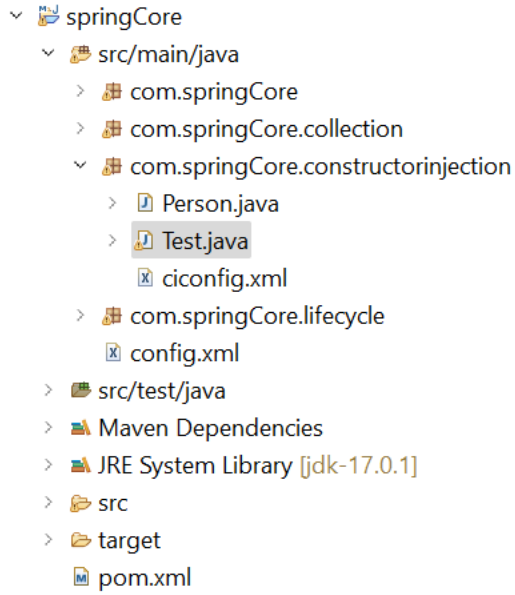
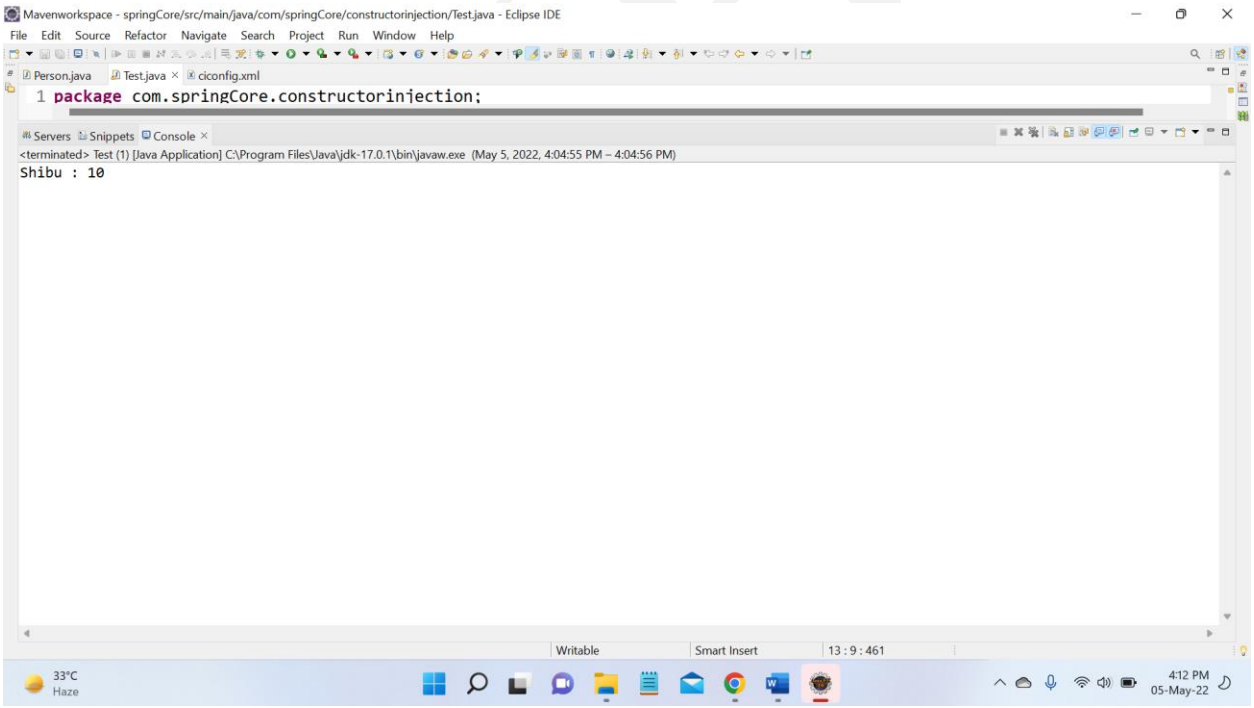
**Output:**



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5. **Write a Spring program for implementing Bean lifecycle method using XML**

**Code:**

**Samosaconfig.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:context="http://www.springframework.org/schema/context"
        xmlns:p="http://www.springframework.org/schema/p"

        xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">


<!-- init is only signature not passing argument so no () this bracket -->

<bean class="com.springCore.lifecycle.Samosa" name="s1" init-method="init" destroy-
method="destroy">

<property name="price" value="10" />
</bean>

</beans>
```

**Test.java:**

```
// program for bean object life cycle.

// implementing Spring Bean object Life cycle methods using XML


package com.springCore.lifecycle;


//import org.springframework.context.ApplicationContext;

import org.springframework.context.support.AbstractApplicationContext;

import org.springframework.context.support.ClassPathXmlApplicationContext;
```

```
public class Test {

	public static void main(String[] args) {
		// TODO Auto-generated method stub

		// for application context
		//ApplicationContext context = new
ClassPathXmlApplicationContext("com/springCore/lifecycle/samosaconfig.xml");

		// for interface
		AbstractApplicationContext context = new
ClassPathXmlApplicationContext("com/springCore/lifecycle/samosaconfig.xml");



		Samosa s1=(Samosa)context.getBean("s1");
		System.out.println(s1);

		// for shutdown
		// ioc method call destroy method from config.xml and shutdown
		// registering shutdown hook enable

		context.registerShutdownHook();

	}

}
```

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**Samosa.java:**

```
// program for bean object life cycle.

package com.springCore.lifecycle;

public class Samosa {
	private double price;


	public Samosa() {
		super();
		// TODO Auto-generated constructor stub
	}

	public double getPrice() {
		return price;
	}

	public void setPrice(double price) {
		System.out.println("setting price");
		this.price = price;
	}

	@Override
	public String toString() {
		return "Samosa [price=" + price + "]";
	}


	// object created
	public void init() {
		System.out.println("Inside init method, Hello I am created...");
	}

	public void destroy() {
		System.out.println("Inside destroy method, bye I am going to die...");
	}

}
```

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**Pom.xml:**

```
<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.springcore</groupId>
	<artifactId>springCore</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springCore</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-core</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-context</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<dependency>
			<groupId>junit</groupId>
			<artifactId>junit</artifactId>
			<version>3.8.1</version>
			<scope>test</scope>
		</dependency>
	</dependencies>
</project>
```

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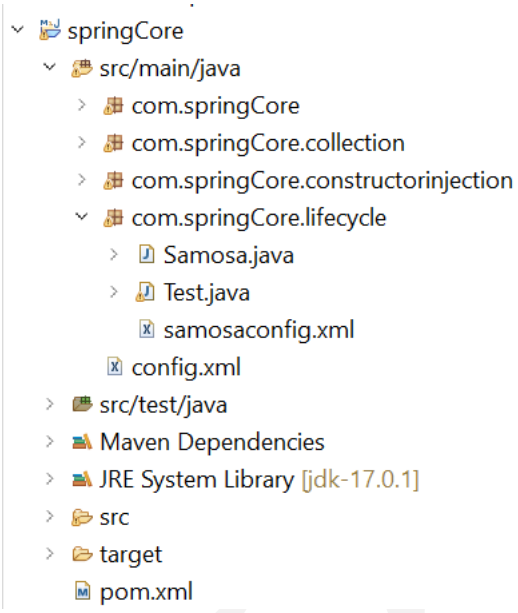
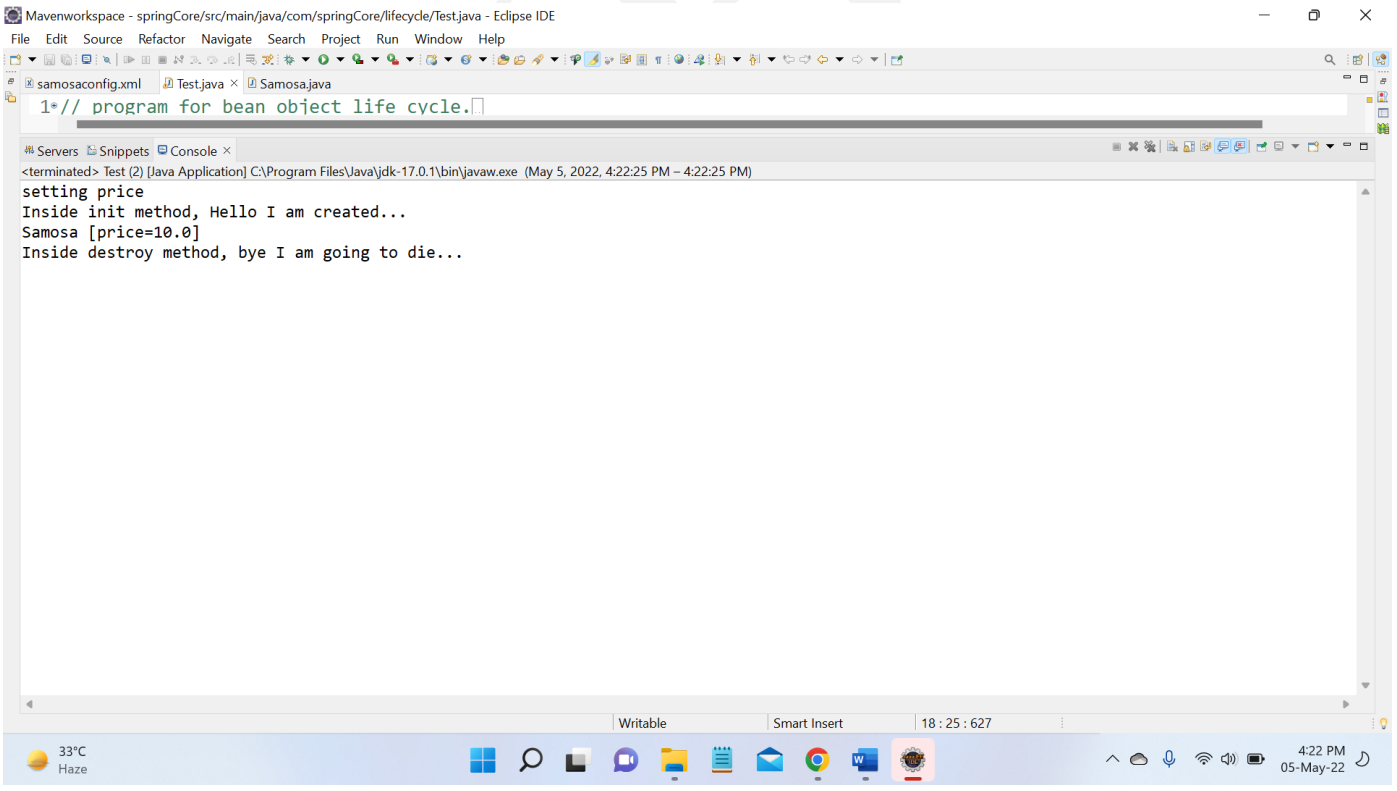
**Output:**



## 6. Create Application for Spring JDBC concept (insert)

**Code:**

**App.java:**

```
package com.spring.jdbc;

import org.springframework.context.ApplicationContext;
import org.springframework.context.support.ClassPathXmlApplicationContext;
import org.springframework.jdbc.core.JdbcTemplate;

/**
 * Hello world!
 *
 */
public class App
{
    public static void main( String[] args )
    {
        System.out.println( "My program stareted..." );

        // spring jdbc -> jdbcTemplate

        ApplicationContext context = new
ClassPathXmlApplicationContext("com/spring/jdbc/config.xml");
        JdbcTemplate template = context.getBean("jdbcTemplate", JdbcTemplate.class);

        // insert query
        String query="insert into student(id,name,city)values(?,?,?)";
```

```
        //fire query
        int result = template.update(query,880,"Shiv","Jaipur");


        //int result = template.update(query,778,"Ninja","Goa");


        System.out.println("number of record inserted..."+result);
    }
}
```

**StudentDao.java:**

```
package com.spring.jdbc.dao;

public interface StudentDao {
        public int insert();

}
```

**StudentDaoImpl:**

```
package com.spring.jdbc.dao;

import org.springframework.jdbc.core.JdbcTemplate;

import com.spring.jdbc.entities.Student;

public class StudentDaoImpl implements StudentDao{

        private JdbcTemplate jdbcTemplate;

public int insert(Student student) {

                //insert  query
            String query="insert into student(id,name,city)values(?,?,?)";
            int
r=this.jdbcTemplate.update(query,student.getId(),student.getName(),student.getCity());

                return r;
        }
```

```
	public JdbcTemplate getJdbcTemplate() {
		return jdbcTemplate;
	}

	public void setJdbcTemplate(JdbcTemplate jdbcTemplate) {
		this.jdbcTemplate = jdbcTemplate;
	}


	public int insert() {
		// TODO Auto-generated method stub
		return 0;
	}
}
```

**Student.java:**

```
package com.spring.jdbc.entities;

public class Student {

	private int id;
	private String name;
	private String city;


	public Student() {

	}
	public Student(int id, String name, String city) {
		super();
		this.id = id;
		this.name = name;
		this.city = city;
	}

	public int getId() {
		return id;
	}
	public void setId(int id) {
		this.id = id;
	}
	public String getName() {
		return name;
	}
	public void setName(String name) {
```

```
		this.name = name;
	}
	public String getCity() {
		return city;
	}
	public void setCity(String city) {
		this.city = city;
	}

	@Override
	public String toString() {
		return "Student [id=" + id + ", name=" + name + ", city=" + city + "]";
	}
}
```

**Config.xml (CONFIGURATION FILE):**

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

<beans xmlns="http://www.springframework.org/schema/beans"
	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
	xmlns:context="http://www.springframework.org/schema/context"
	xmlns:p="http://www.springframework.org/schema/p"

	xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">


 <bean class="org.springframework.jdbc.datasource.DriverManagerDataSource" name="ds">
 <property name="driverClassName" value="com.mysql.jdbc.Driver" />
 <property name="url" value="jdbc:mysql://localhost:3306/springjdbc?useSSL=false" />
 <property name="username" value="root" />
 <property name="password" value="shibu@ninja"/>
 </bean>

 <!-- useSSL=false to not to display SSL exception -->

 <!-- <bean class="org.springframework.jdbc.core.JdbcTemplate" name="jdbcTemplate">
 <property name="datasource">
 <ref bean="ds"/>
 </property>
 </bean> -->

 <bean class="org.springframework.jdbc.core.JdbcTemplate" name="jdbcTemplate"
```

```
p:dataSource-ref="ds"/>


</beans>
```

**Pom.xml:**

```
<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.spring.jdbc</groupId>
	<artifactId>springjdbc</artifactId>
	<version>0.0.1-SNAPSHOT</version>
	<packaging>jar</packaging>

	<name>springjdbc</name>
	<url>http://maven.apache.org</url>

	<properties>
		<project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
	</properties>

	<dependencies>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-core -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-core</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-context -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-context</artifactId>
			<version>5.2.3.RELEASE</version>
		</dependency>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-jdbc -->
		<dependency>
			<groupId>org.springframework</groupId>
```

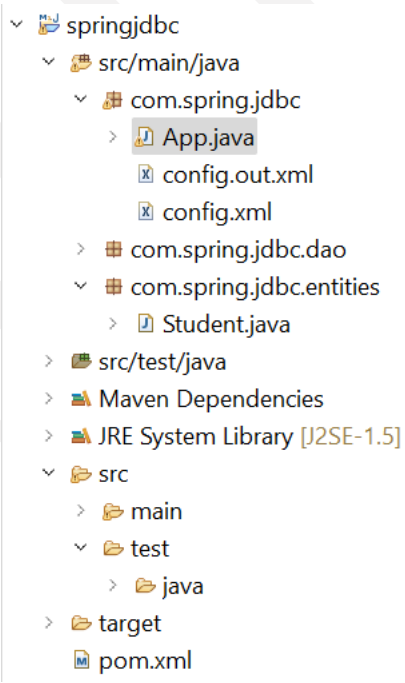
```
            <artifactId>spring-jdbc</artifactId>
            <version>5.2.3.RELEASE</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
        <dependency>
            <groupId>mysql</groupId>
            <artifactId>mysql-connector-java</artifactId>
            <version>5.1.47</version>
        </dependency>


        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>3.8.1</version>
            <scope>test</scope>
        </dependency>


    </dependencies>
</project>
```

**Output:**



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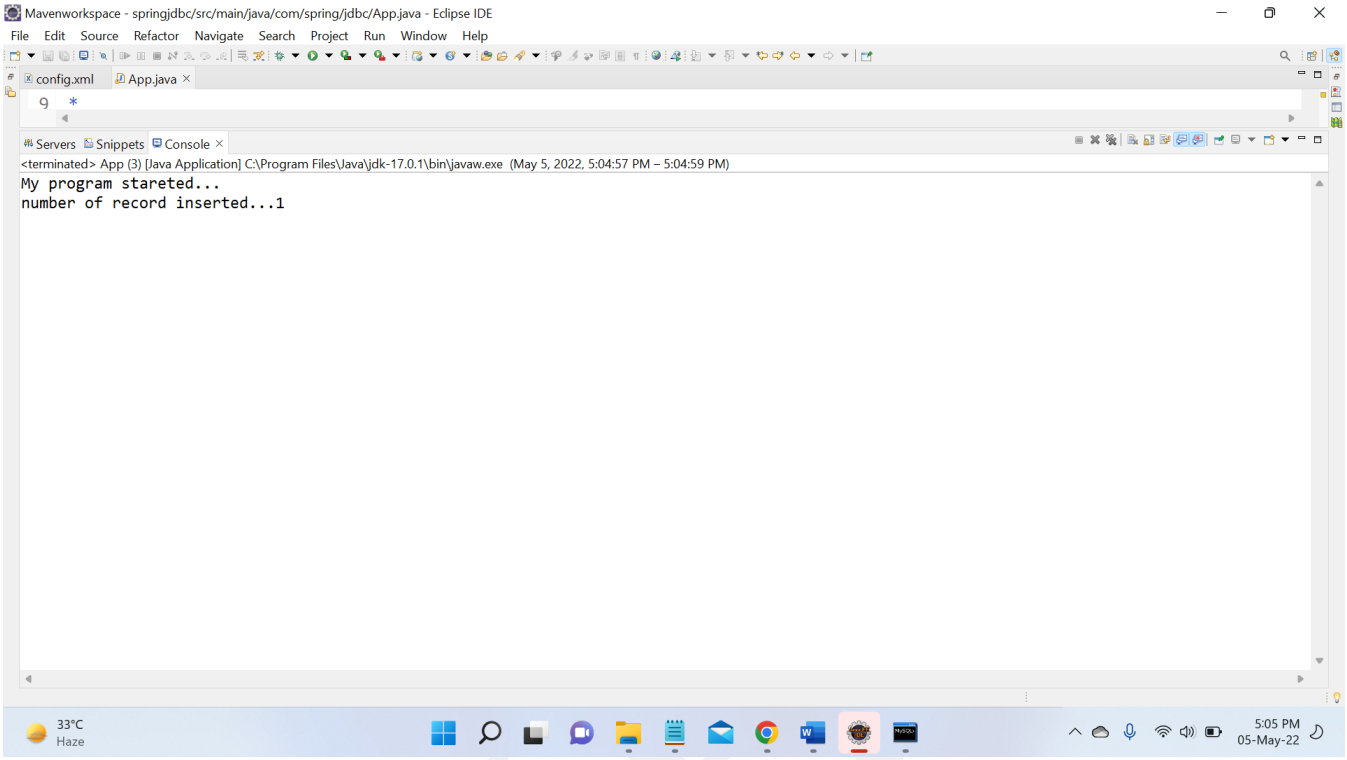
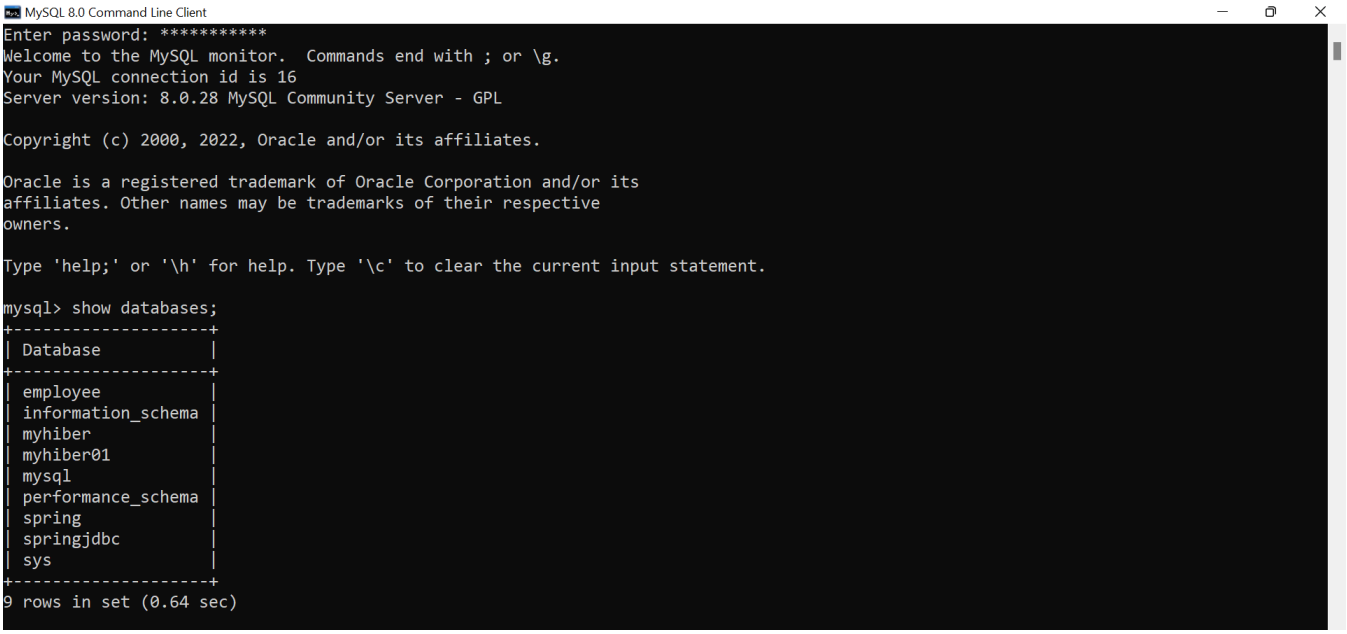



## MySql Output:



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```
mysql> use springjdbc;
Database changed
mysql> show tables;
+---------------------+
| Tables_in_springjdbc |
+---------------------+
| student             |
+---------------------+
1 row in set (0.19 sec)

mysql> select * from student;
+-----+-----------+--------+
| id  | name      | city   |
+-----+-----------+--------+
| 111 | shibu     | mumbai |
| 777 | Mohapatra | Delhi  |
| 778 | Ninja     | Goa    |
| 779 | Mohapatra | Delhi  |
+-----+-----------+--------+
4 rows in set (0.00 sec)
```

```
mysql> select * from student;
+-----+-----------+--------+
| id  | name      | city   |
+-----+-----------+--------+
| 111 | shibu     | mumbai |
| 777 | Mohapatra | Delhi  |
| 778 | Ninja     | Goa    |
| 779 | Mohapatra | Delhi  |
| 880 | Shiv      | Jaipur |
+-----+-----------+--------+
5 rows in set (0.00 sec)

mysql>
```

## 7. Create Application for Spring MVC.

**Code:**

**HomeController.java:**

```
package springmvc.controller;

import org.springframework.web.bind.annotation.RequestMapping;

public class HomeController {

	@RequestMapping("/home")
	public String home() {
		System.out.println("This is Home URL..");
		return "index";
	}

}
```

**Index.jsp:**

```
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
	pageEncoding="ISO-8859-1"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="ISO-8859-1">
<title>Home Page</title>
</head>
<body>
	<h1>This is home page</h1>
	<h1>called by home controller. URL/Home</h1>
</body>
</html>
```

**Web.xml:**

```
<!DOCTYPE web-app PUBLIC
 "-//Sun Microsystems, Inc.//DTD Web Application 2.3//EN"
 "http://java.sun.com/dtd/web-app_2_3.dtd" >

<web-app>
  <display-name>Archetype Created Web Application</display-name>
```

```
  <!--  configuration dispatcher servlet -->
  <servlet>
  <servlet-name>Spring</servlet-name>

  <!-- got from  DispatcherServlet.class or
  make a demo test.java class file and press ctrl + shift + T and select DispatcherServlet class
name from the opened file
  -->
  <servlet-class>package org.springframework.web.servlet.DispatcherServlet</servlet-class>
   </servlet>

  <!-- mapping -->
  <servlet-mapping>
  <servlet-name>spring</servlet-name>
  <url-pattern>/</url-pattern>
  </servlet-mapping>


</web-app>
```

**Spring-servlet.xml:**

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xmlns:context="http://www.springframework.org/schema/context"
        xmlns:p="http://www.springframework.org/schema/p"

        xsi:schemaLocation="http://www.springframework.org/schema/beans
 http://www.springframework.org/schema/beans/spring-beans.xsd
 http://www.springframework.org/schema/context
 http://www.springframework.org/schema/context/spring-context.xsd">

<context:component-scan base-package="springmvc.controller"></context:component-scan>

        <bean
                class="org.springframework.web.servlet.view.InternalResourceViewResolver"
                name="viewResolver">

                <property name="prefix" value="/WEB-INF/views/" />
                <property name="suffix" value=".jsp" />

        </bean>
</beans>
```

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**Pom.xml:**

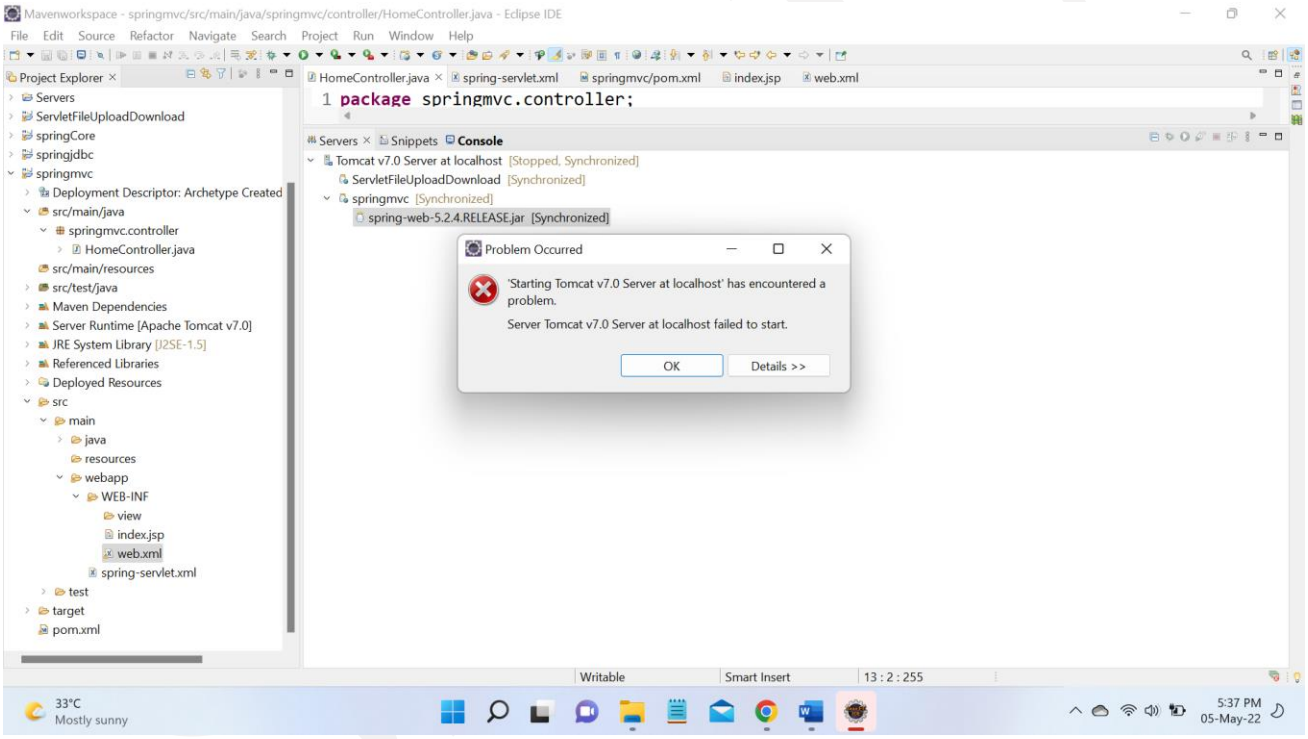
```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-
v4_0_0.xsd">
	<modelVersion>4.0.0</modelVersion>
	<groupId>com.spring.mvc</groupId>
	<artifactId>springmvc1</artifactId>
	<packaging>war</packaging>
	<version>0.0.1-SNAPSHOT</version>
	<name>springmvc1 Maven Webapp</name>
	<url>http://maven.apache.org</url>
	<dependencies>
		<dependency>
			<groupId>junit</groupId>
			<artifactId>junit</artifactId>
			<version>3.8.1</version>
			<scope>test</scope>
		</dependency>

		<dependency>
			<groupId>javax.servlet</groupId>
			<artifactId>javax.servlet-api</artifactId>
			<version>3.0.1</version>
			<scope>provided</scope>
		</dependency>

		<!-- https://mvnrepository.com/artifact/org.springframework/spring-webmvc -->
		<dependency>
			<groupId>org.springframework</groupId>
			<artifactId>spring-webmvc</artifactId>
			<version>5.2.4.RELEASE</version>
		</dependency>


	</dependencies>

	<build>
		<finalName>springmvc</finalName>
		<plugins>
			<plugin>
				<groupId>org.springframework.boot</groupId>
				<artifactId>spring-boot-maven-plugin</artifactId>
			</plugin>
			<plugin>
				<groupId>org.apache.maven.plugins</groupId>
```

```
                    <artifactId>maven-war-plugin</artifactId>
                    <version>3.3.1</version>
                </plugin>
            </plugins>
        </build>
</project>
```

**Output:**

**Note:**

**Due to the Apache Tomcat not starting the output for the following is displayed as below in the eclipse, with also changing of port number the output of the program remains the same.**




“

**Once the program is successfully executed the output in the browser will be displayed as:**

This is home page

called by home controller.

”