Lesson 01 Demo 03

JSP and JDBC

Objective: To explore JSP and JDBC

Tools Required: Eclipse IDE

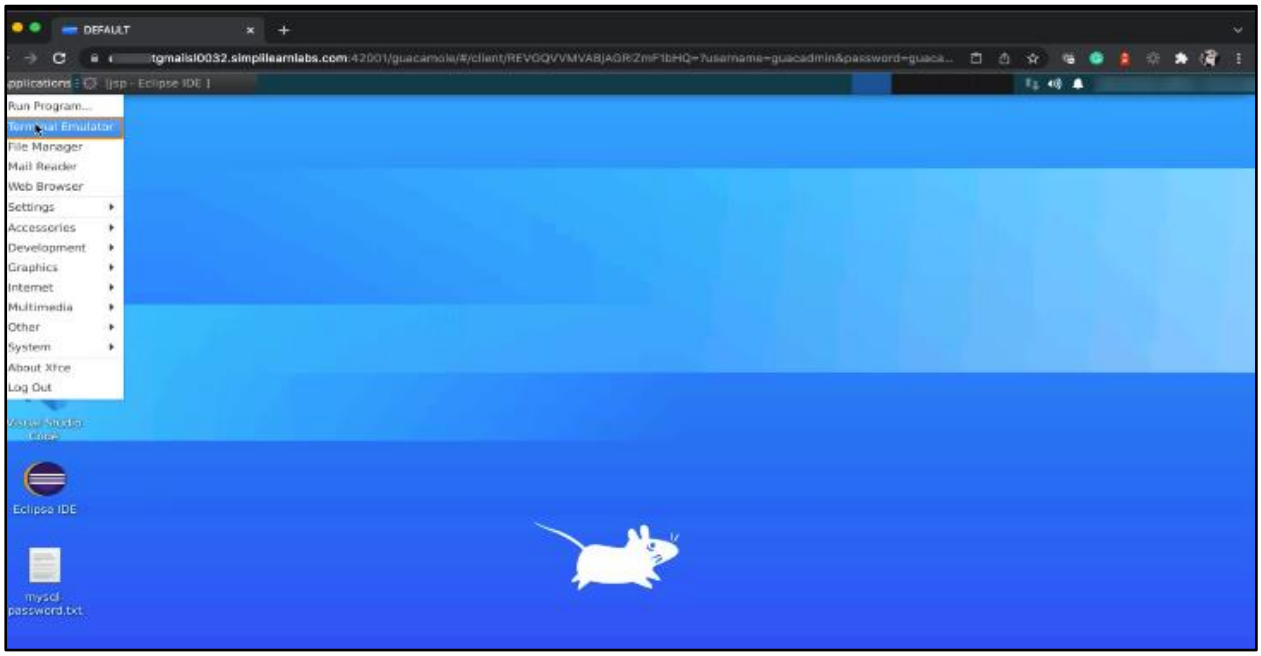
Prerequisites: None

Steps to be followed:

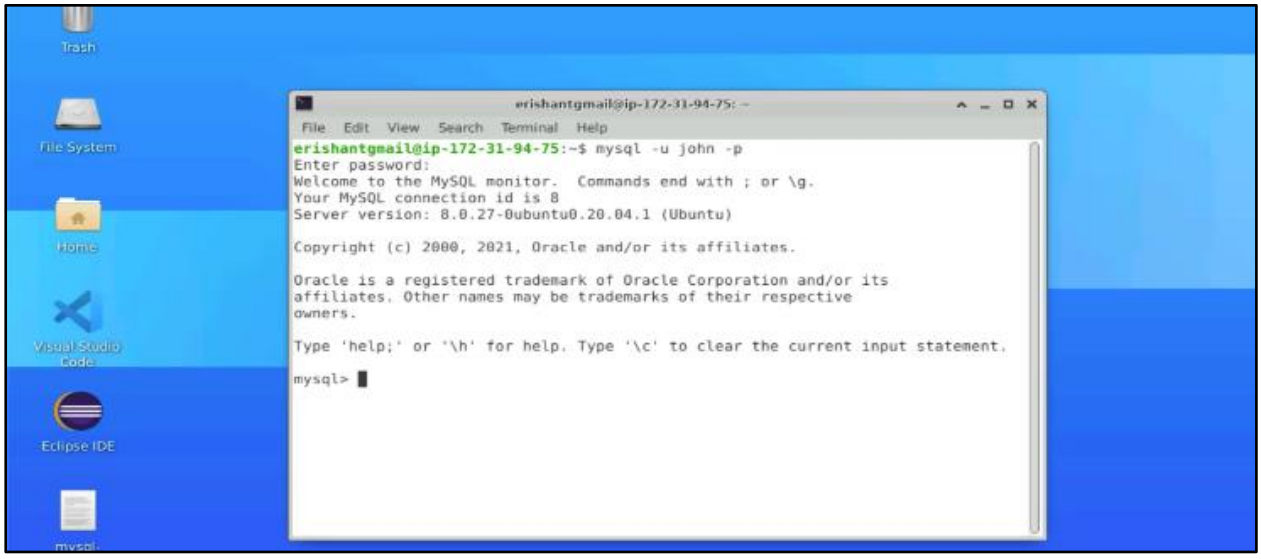
1. Open the terminal emulator and perform the operation
2. Search for the Maven Repository in the browser
3. Create a new class
4. Create a connection
5. Create another class and pass the attributes
6. Go to the index.jsp page
7. Add a new JSP file
8. Create an object for a prepared statement
9. Create an HTML file in the web app directory
10. Create another JSP file
11. Add an SQL statement
12. Set the if case
13. Try to login using the link

Step 1: Open the terminal emulator and perform the operation

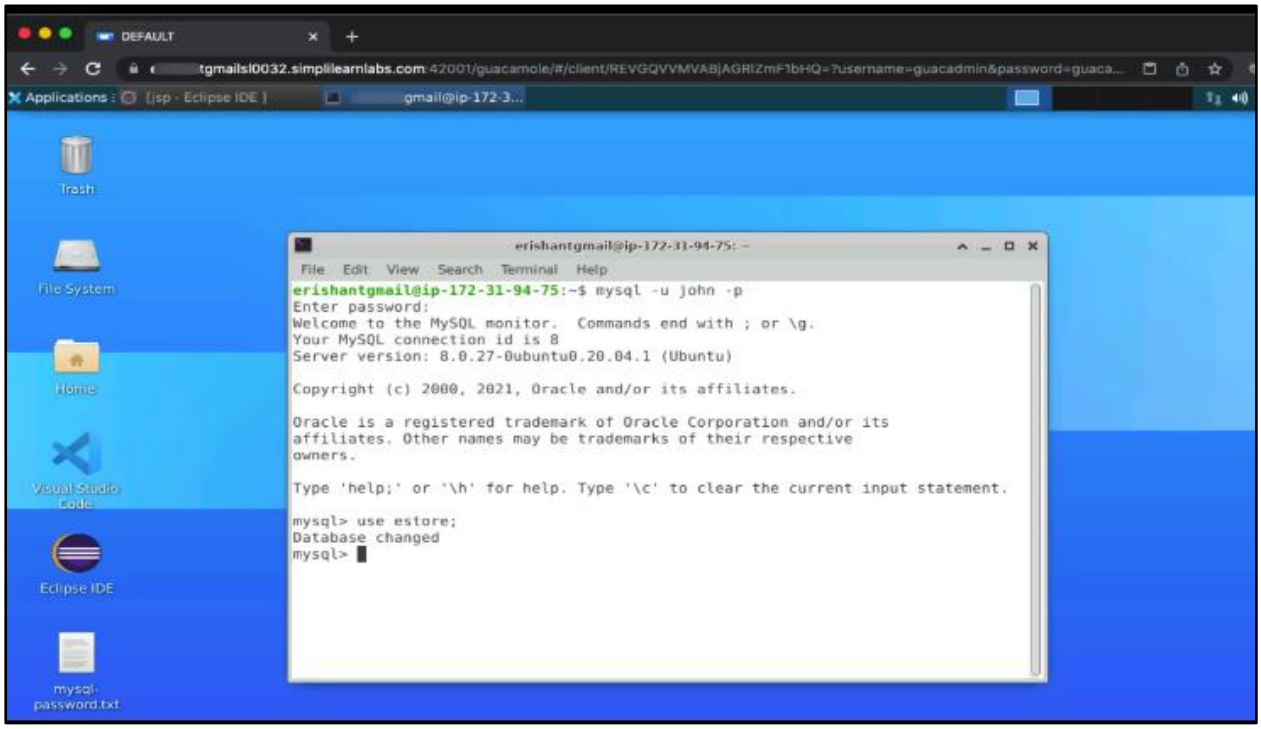
1.1 Open the terminal emulator



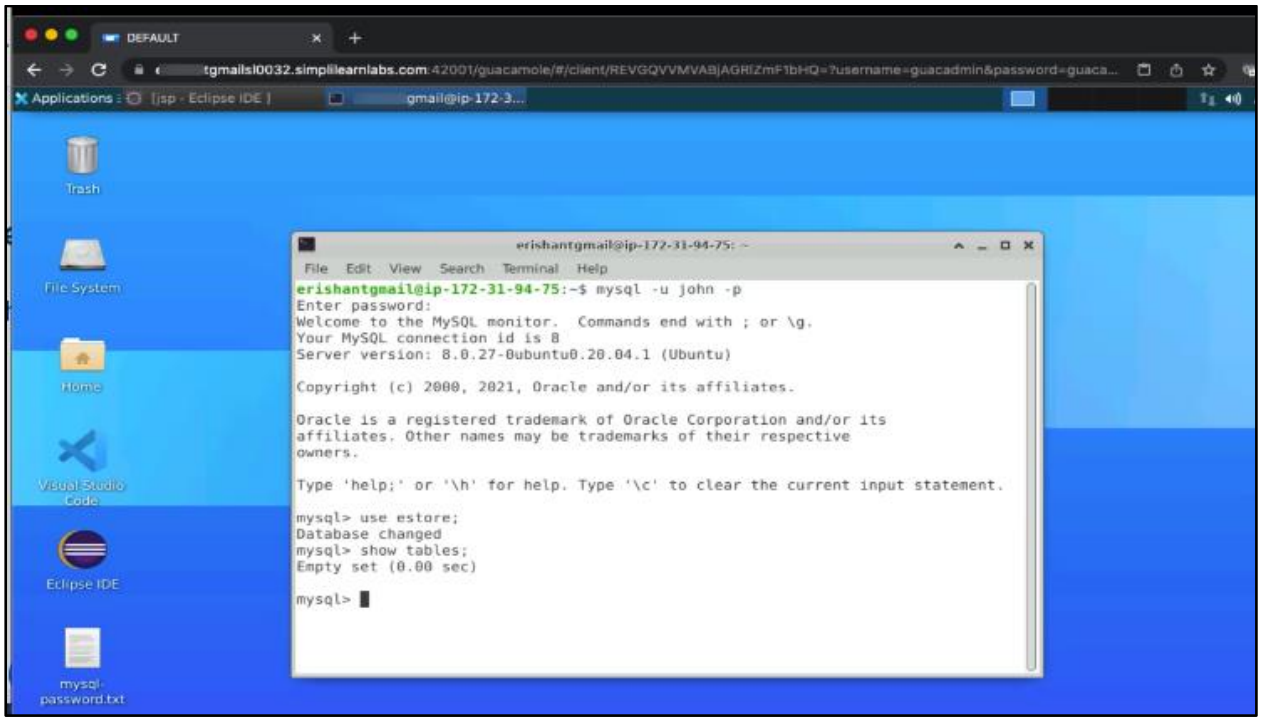
1.2 Log in with the username and password



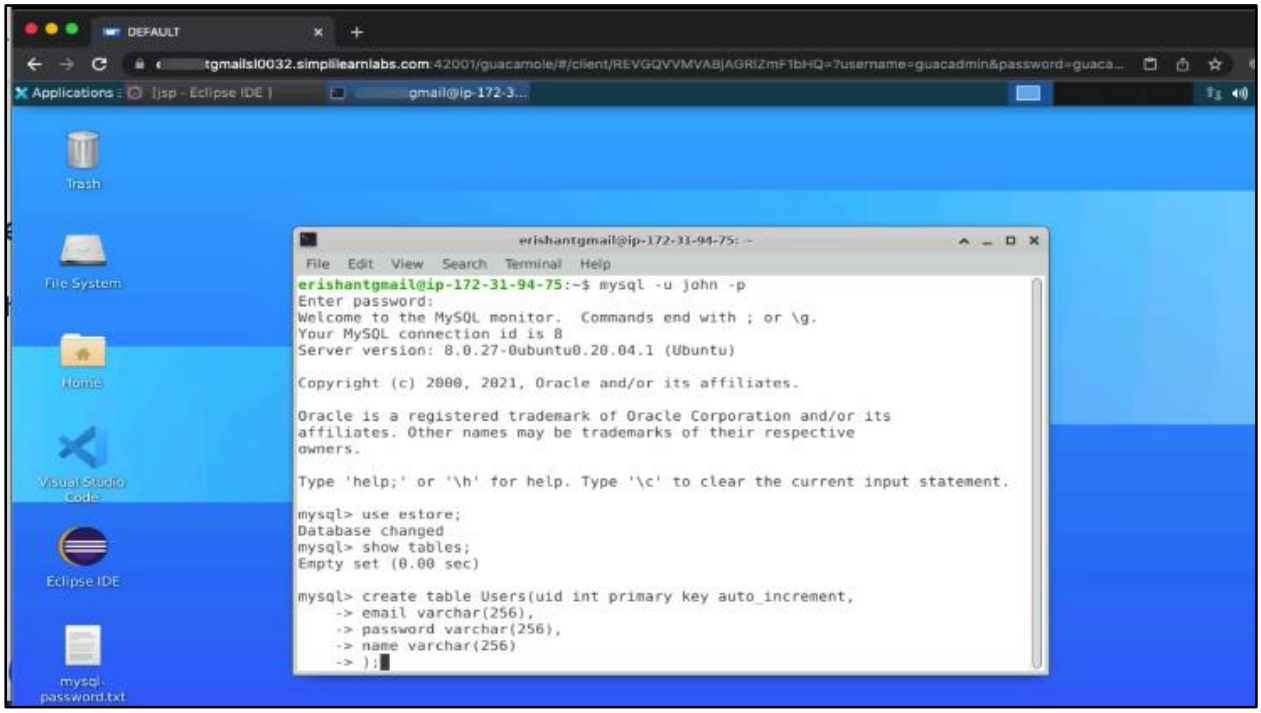
1.3 Enter **use estore;**



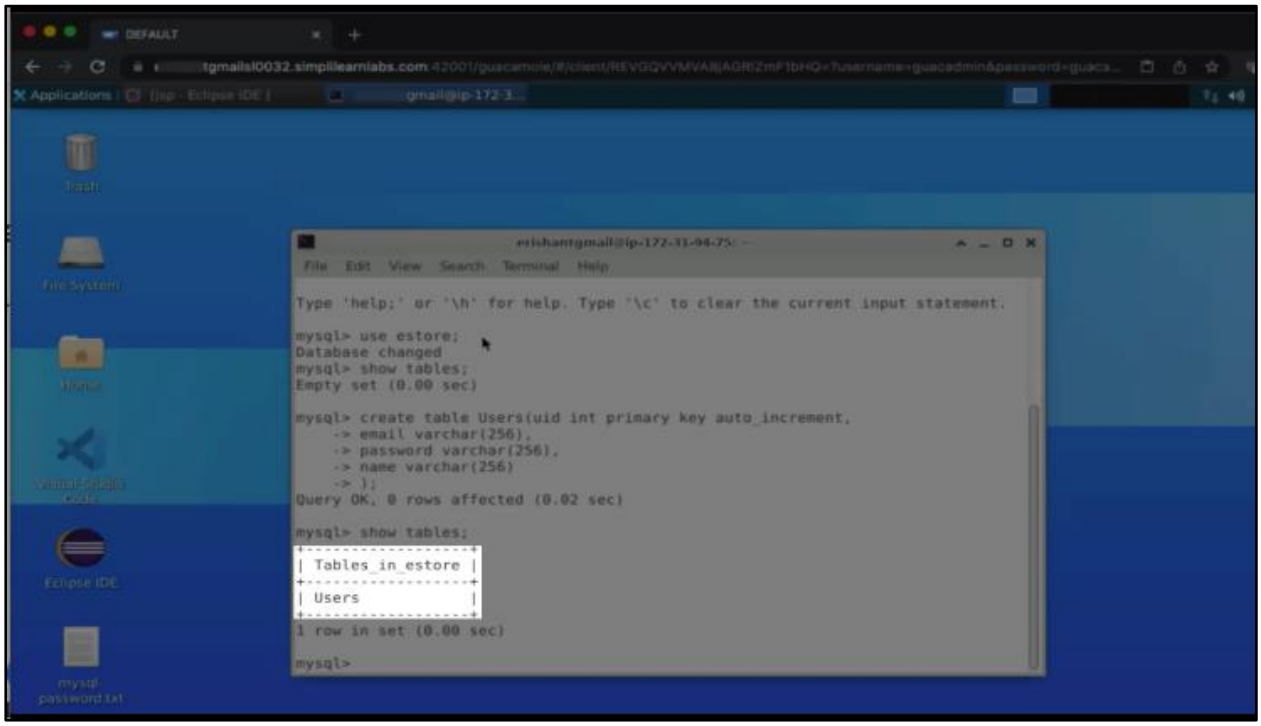
1.4 Enter **show tables;**



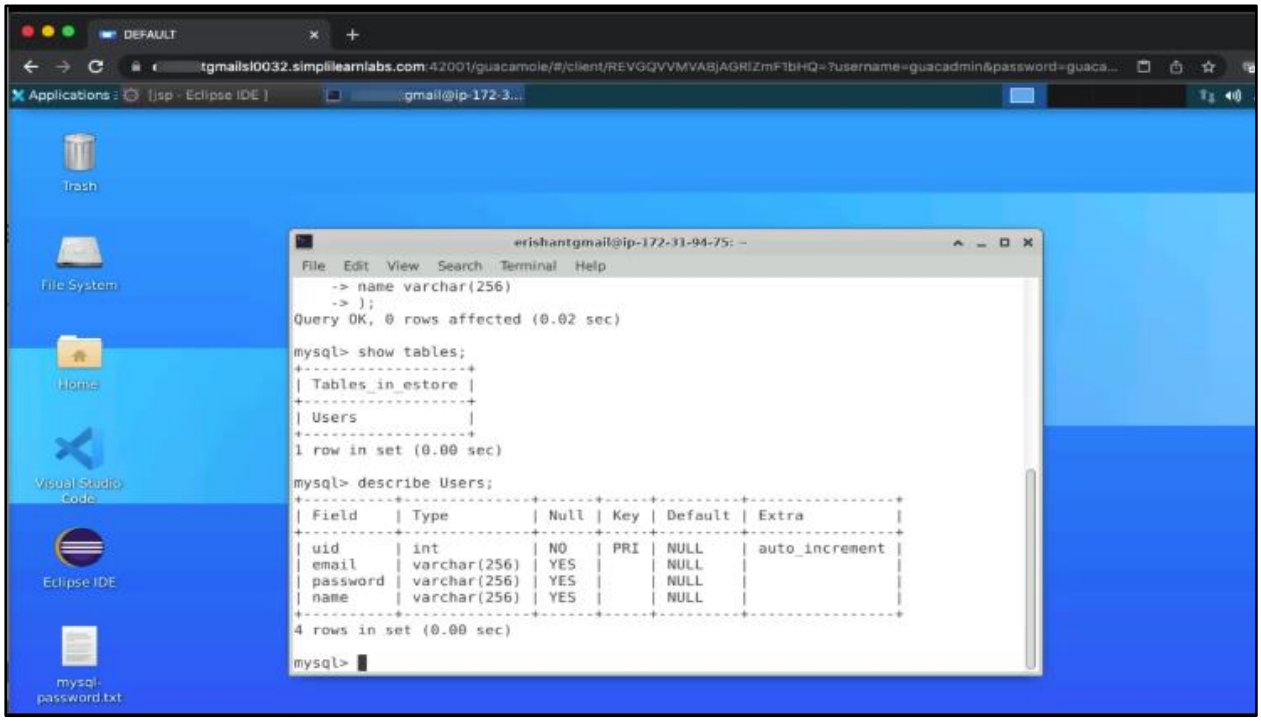
1.5 Enter **create table Users** with attributes and datatype



1.6 Enter **show tables;** again

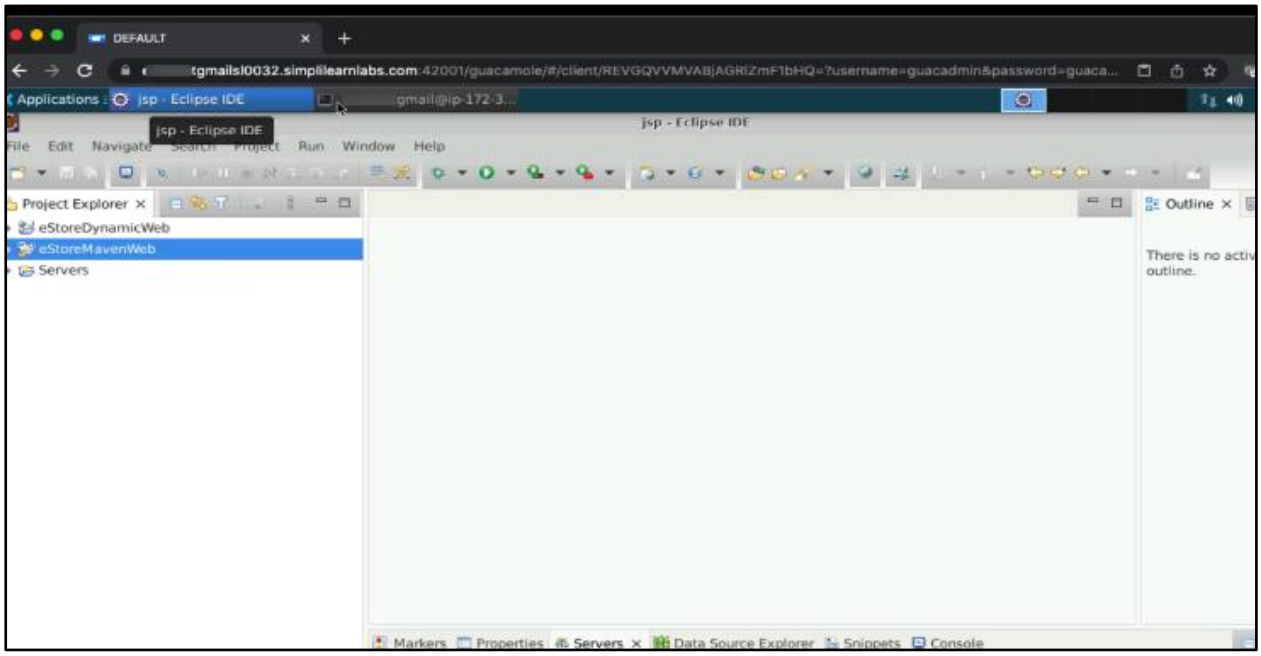


1.7 Enter **describe Users;**

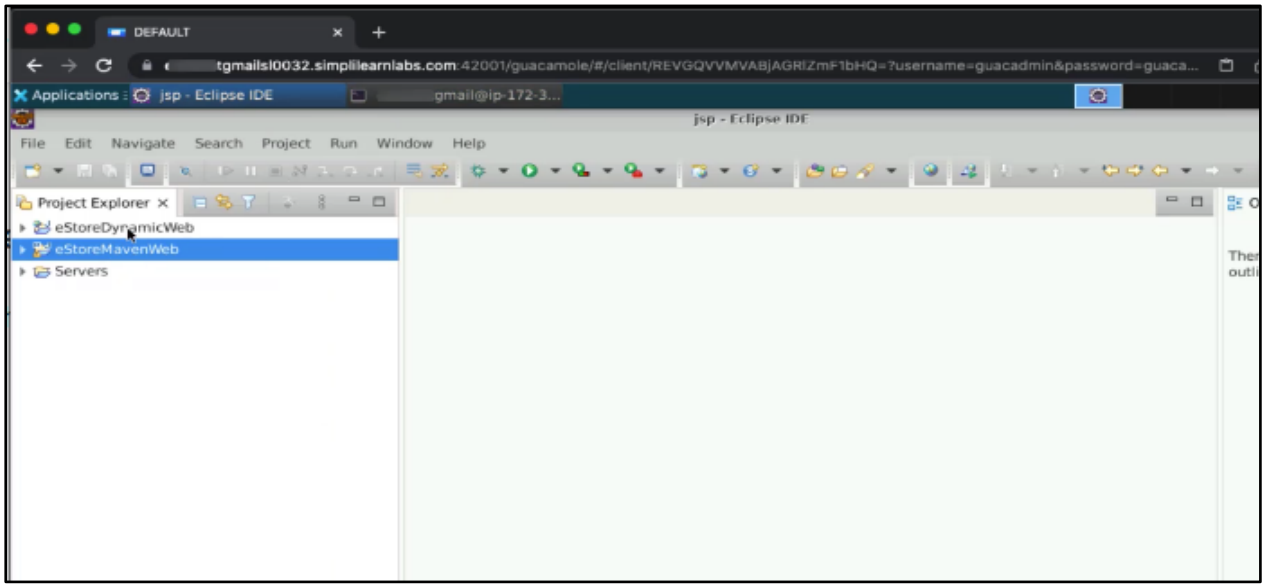


Step 2: Search for the Maven repository in the browser

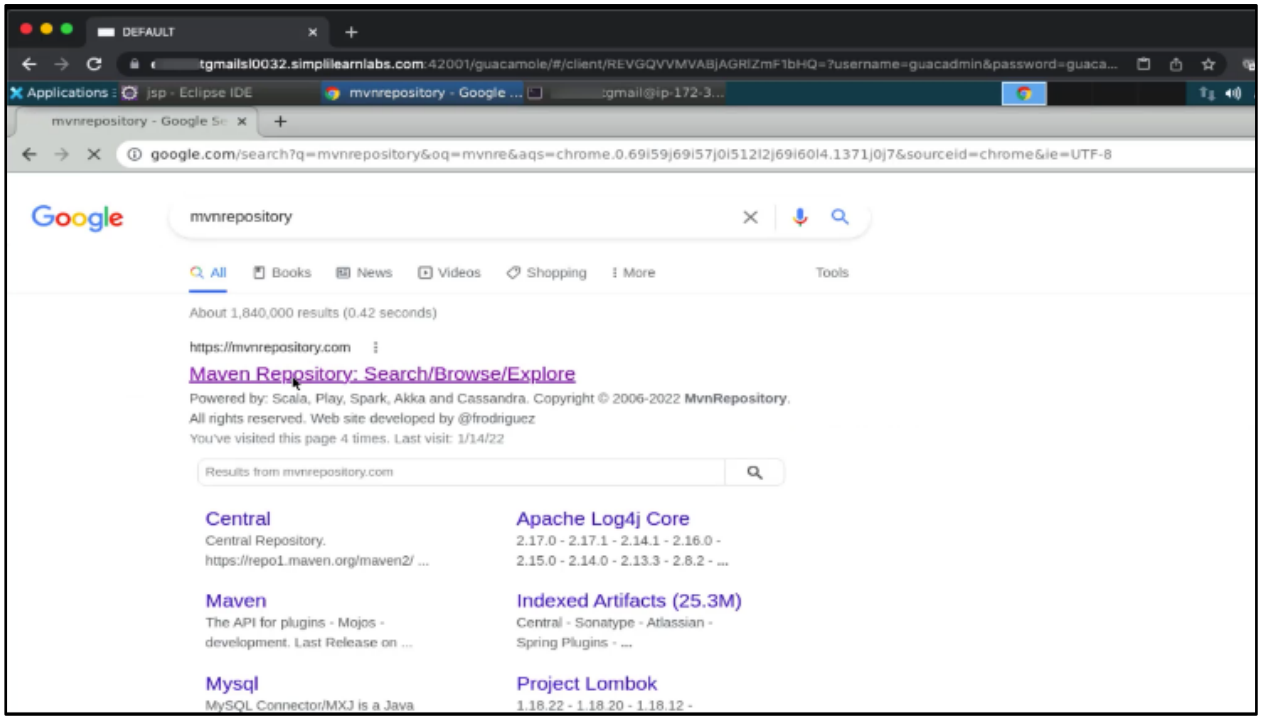
2.1 Open **Eclipse IDE**



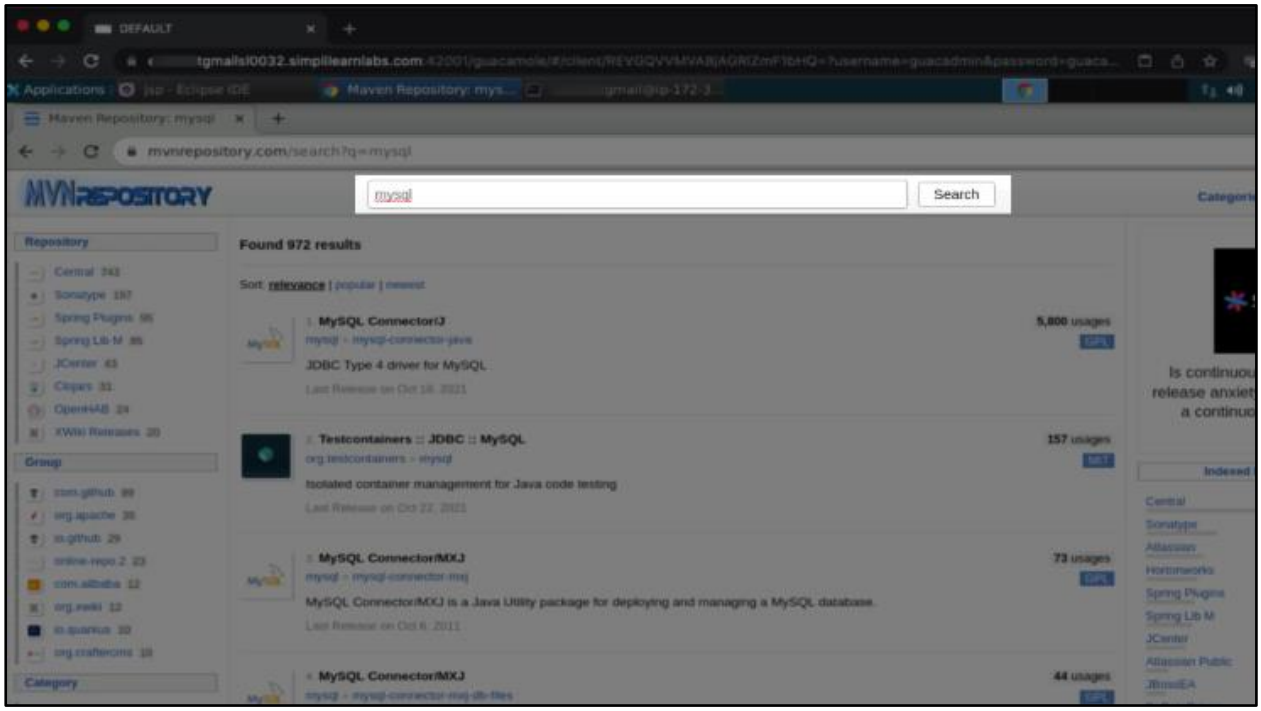
2.2 Open **eStoreDynamicWeb** or **eStoreMavenWeb**



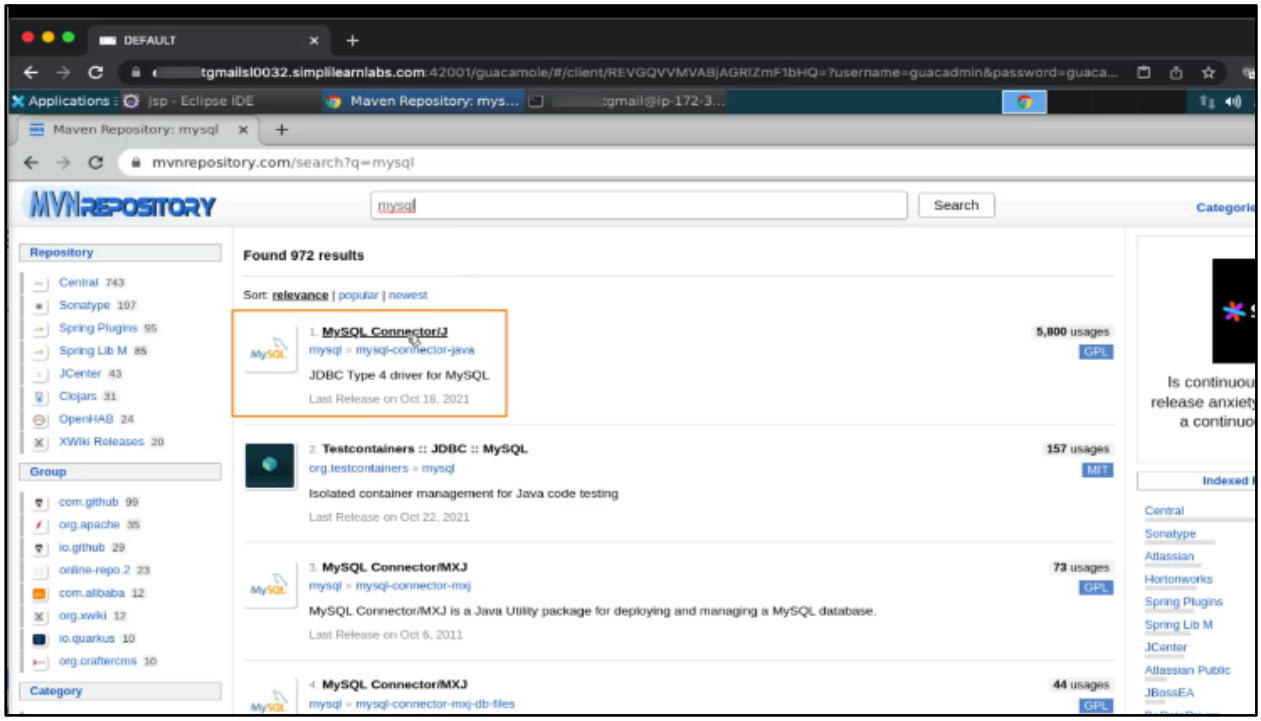
2.3 Search for the **Maven Repository** in the browser



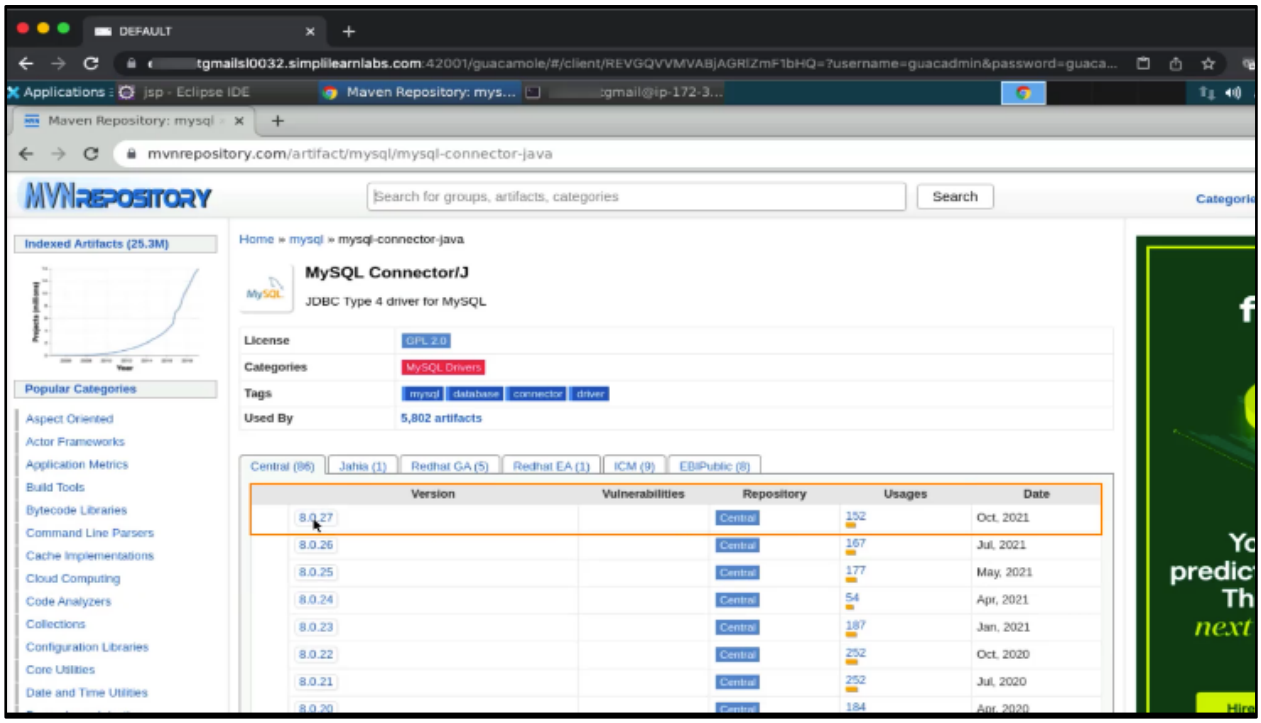
2.4 In the search bar, type **mysql**



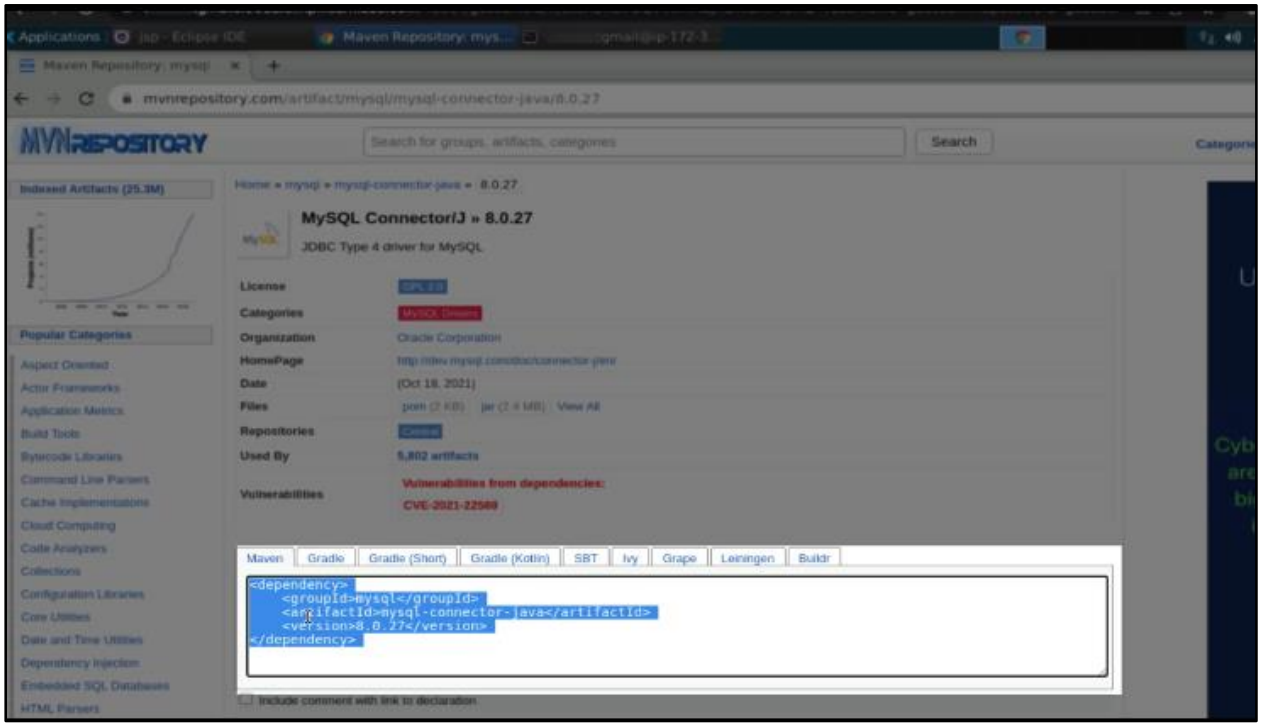
2.5 Select **MySQL Connector/J**



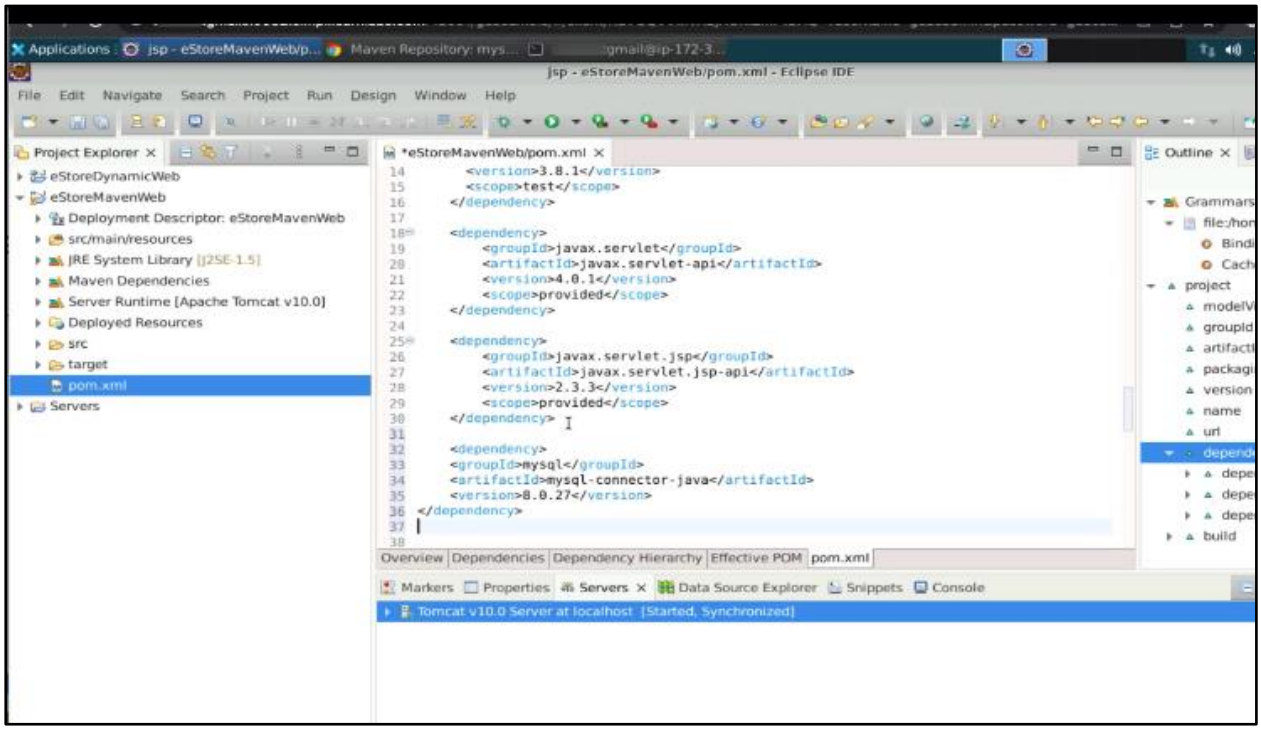
2.6 Select the latest version



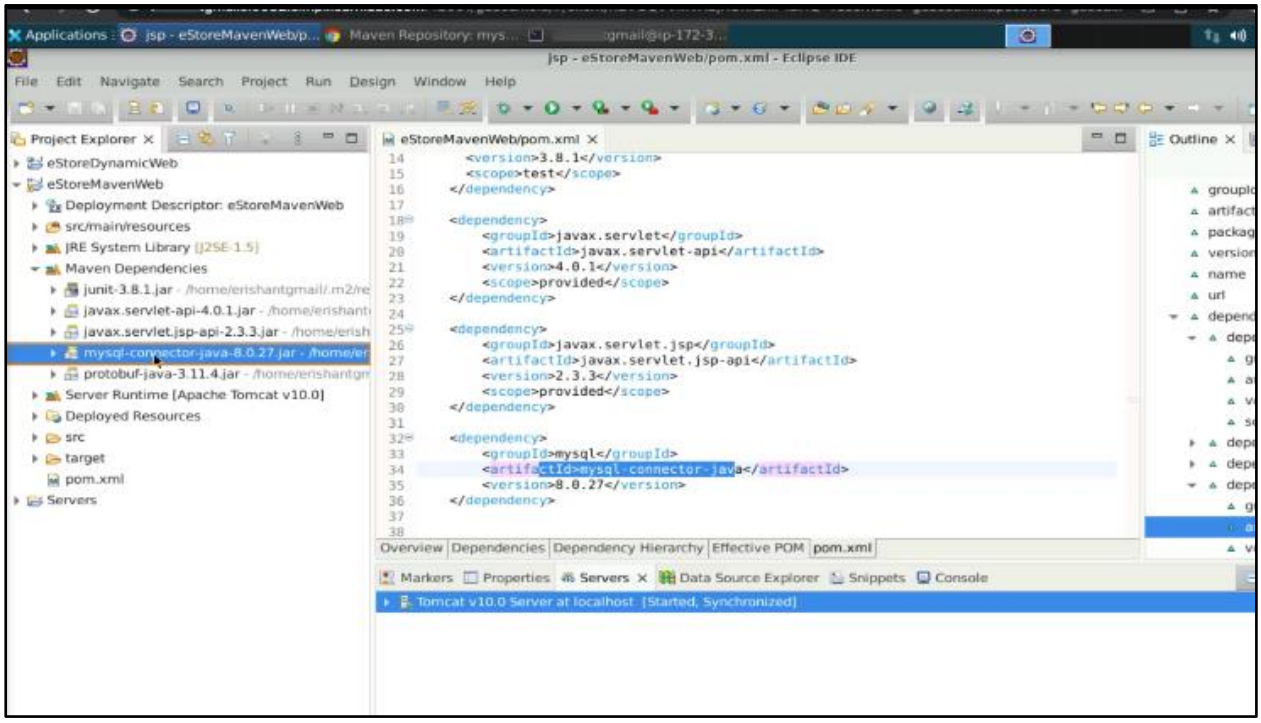
2.7 Copy the **dependency**



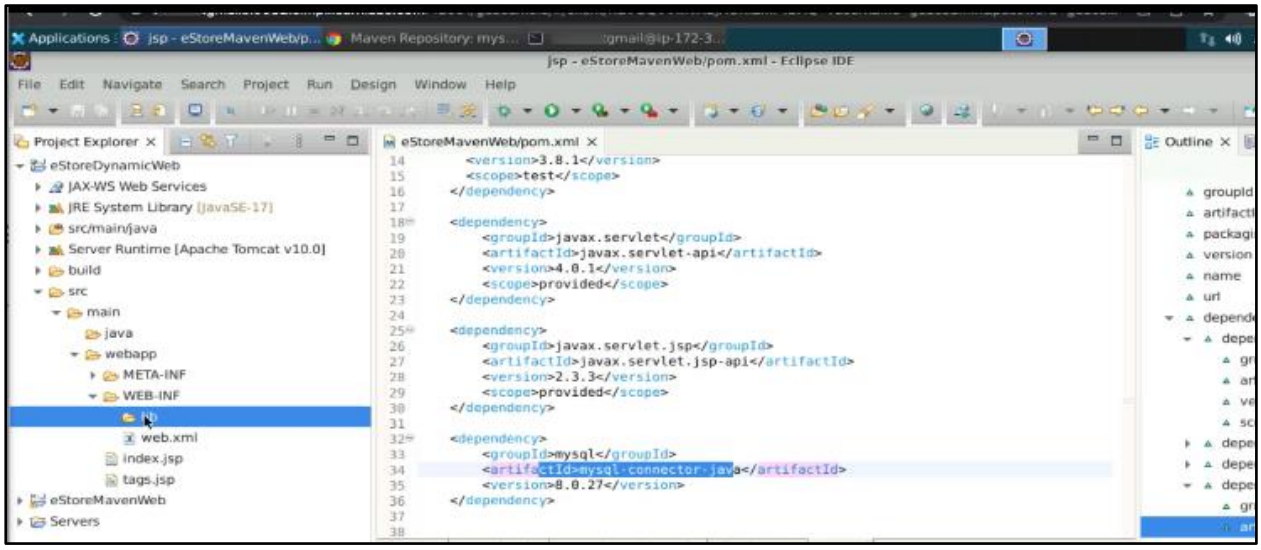
2.8 Paste the dependency in the **pom.xml** file



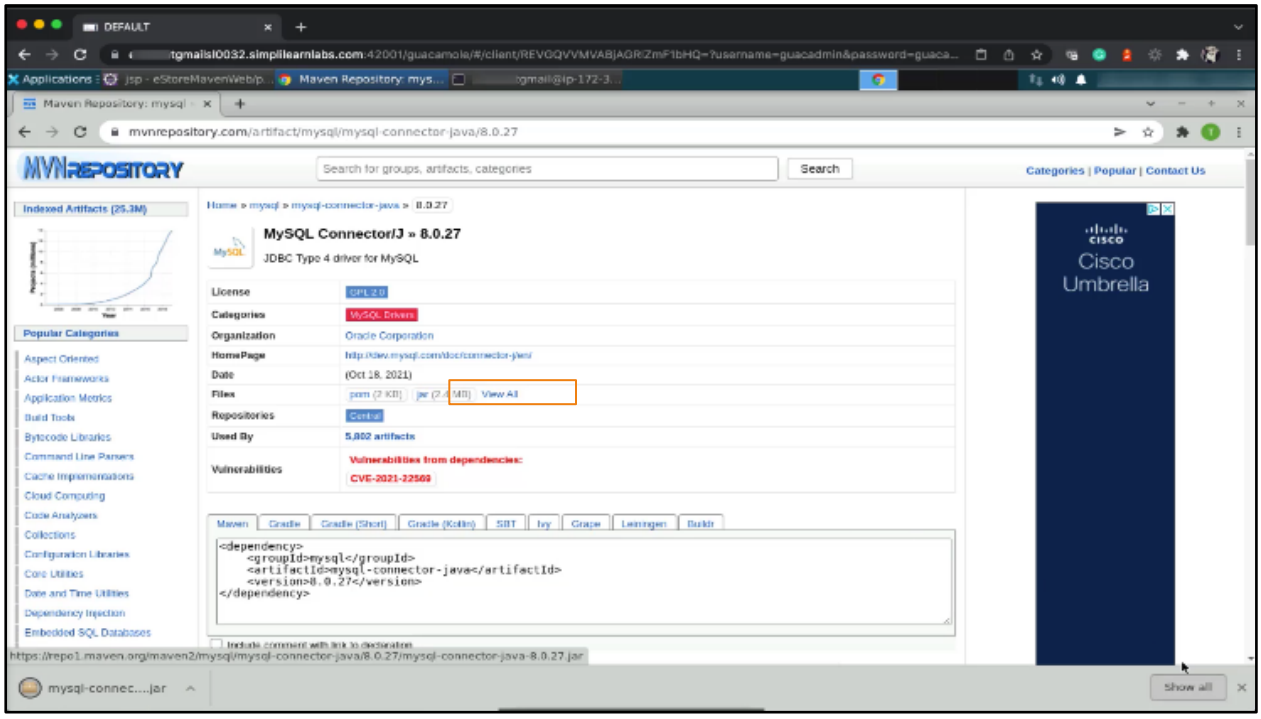
2.9 **Save** the pom.xml file



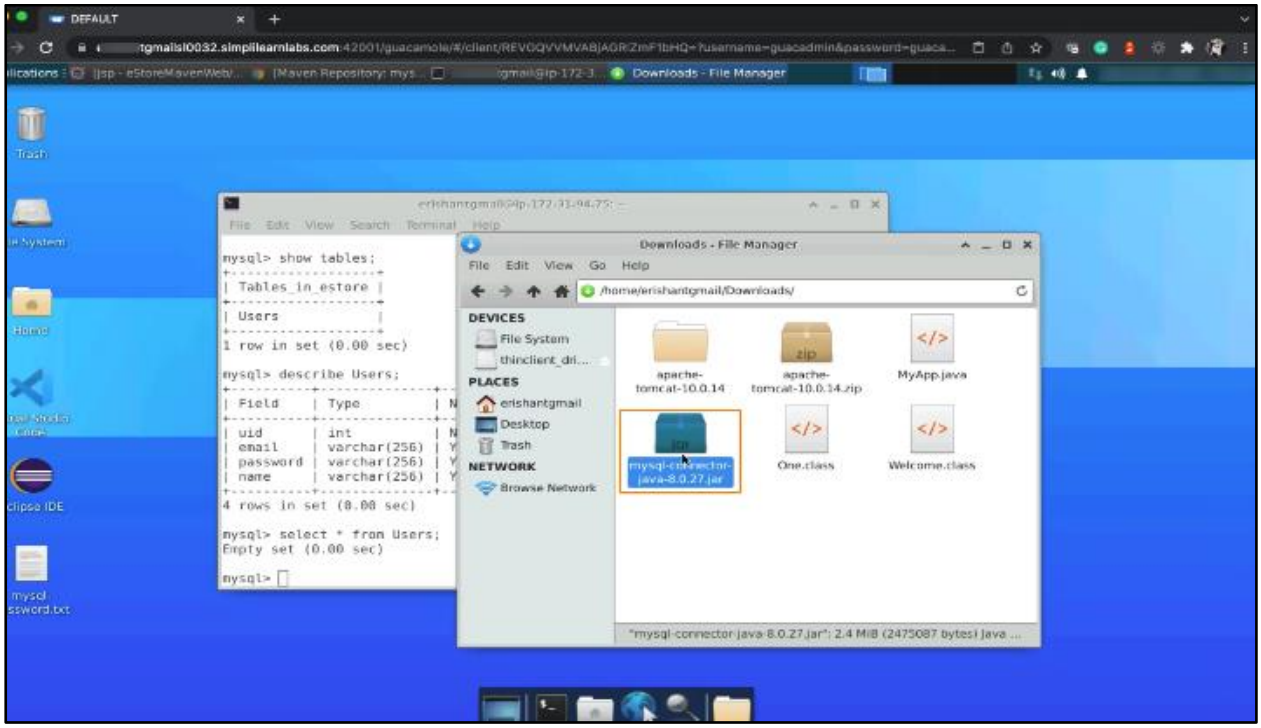
2.10 Open the **lib** folder from the **WEB-INF** directory



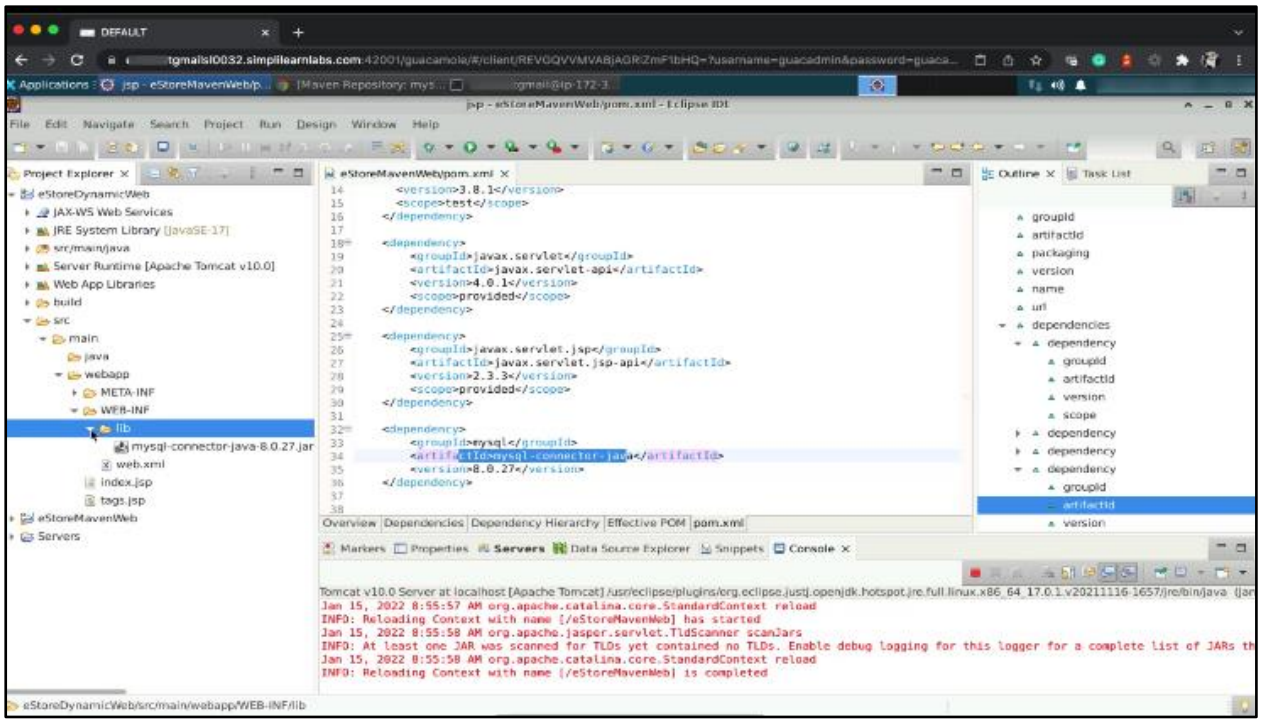
2.11 Click on the **jar file** from the MVN repository



2.12 Navigate to the **Downloads** directory

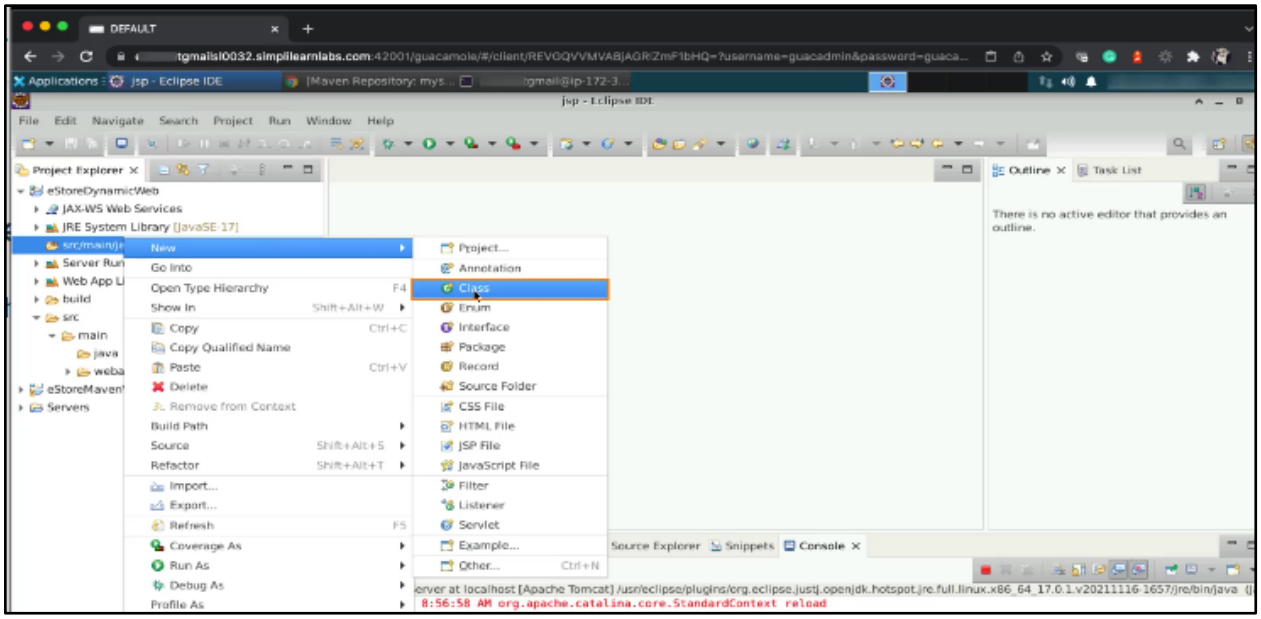


2.13 Copy the **jar** and bring it to the Eclipse library folder

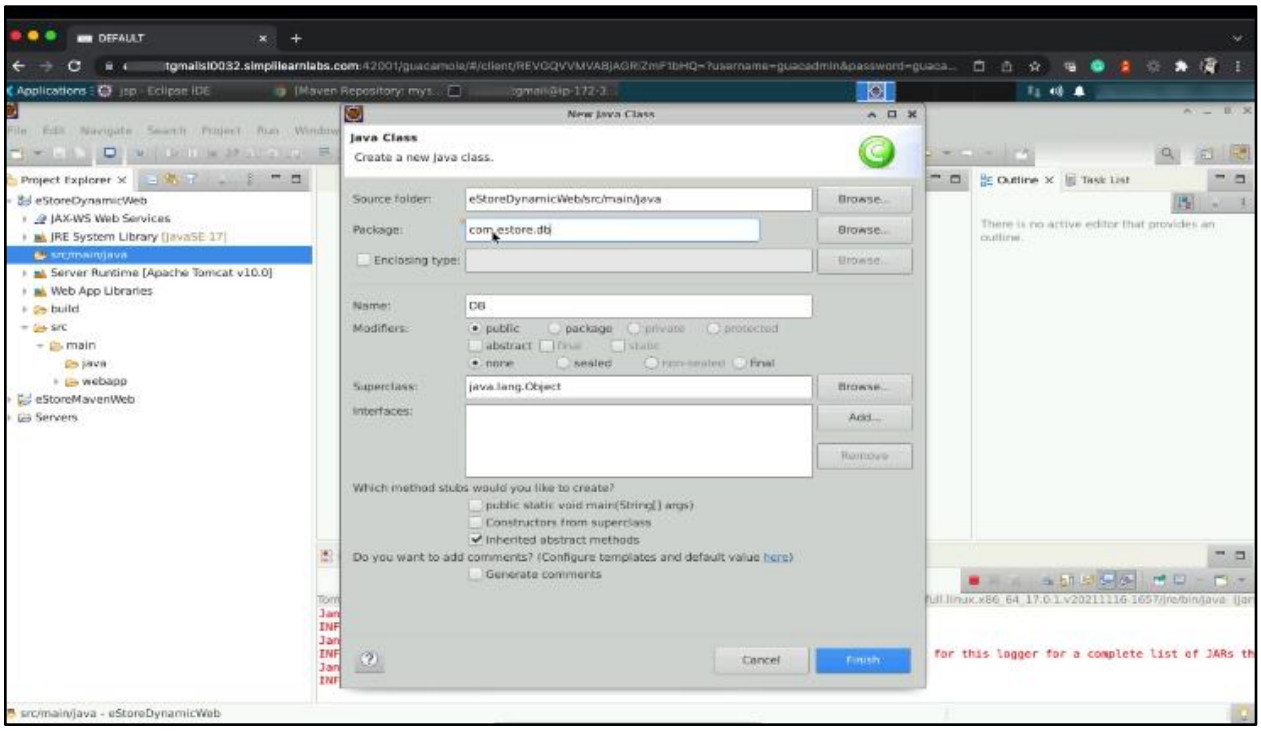


Step 3: Create a new class

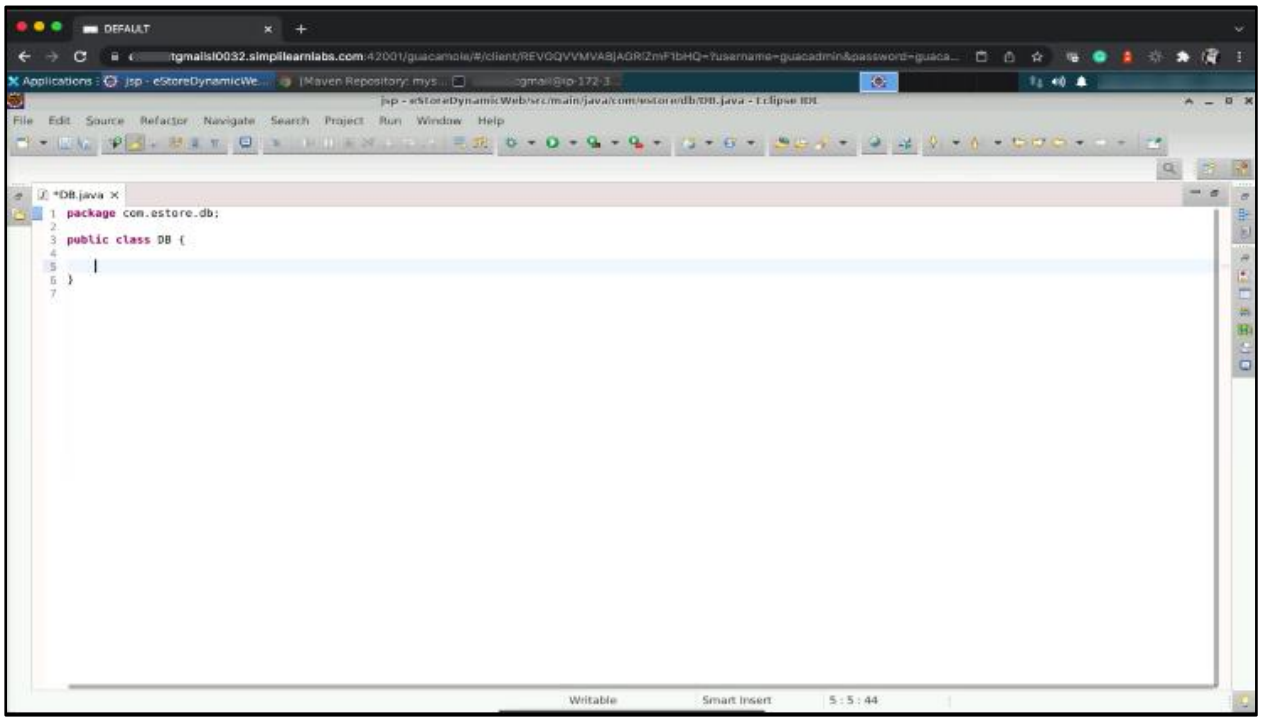
3.1 Create a **New Class** in the **src/main/java file**



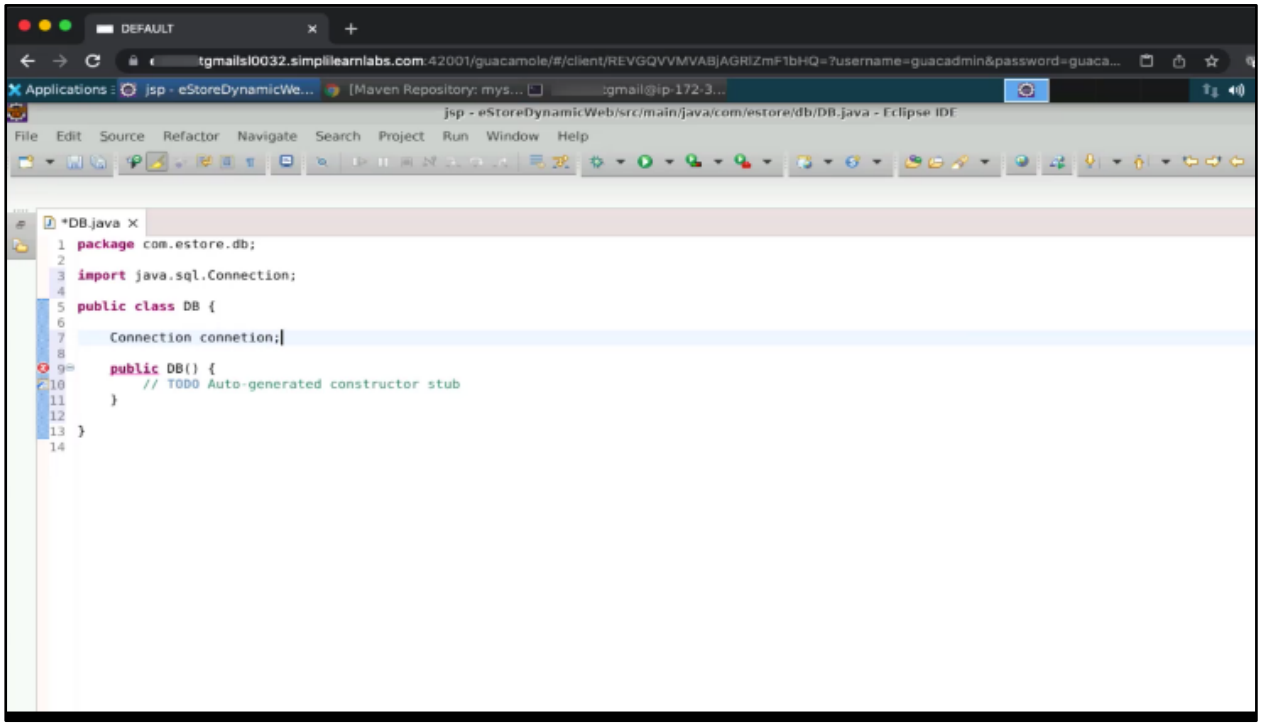
3.2 Add a class name and a package name, and click on **Finish**



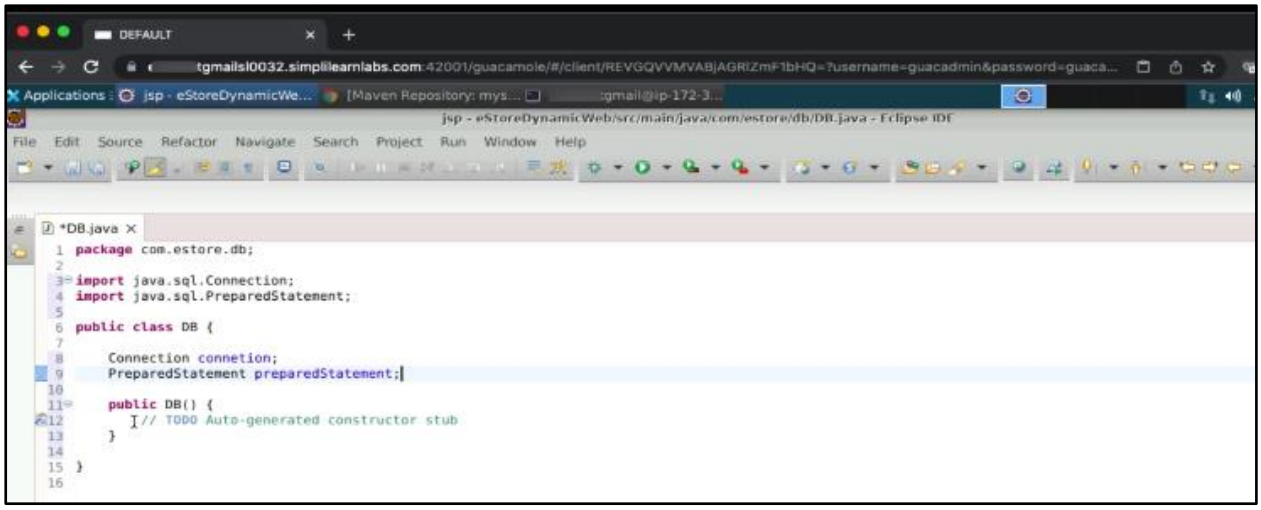
3.3 Write the DB connectivity code in the **DB.java** file



3.4 Now, declare an API named **Connection**



3.5 Type **PreparedStatement** from the Java



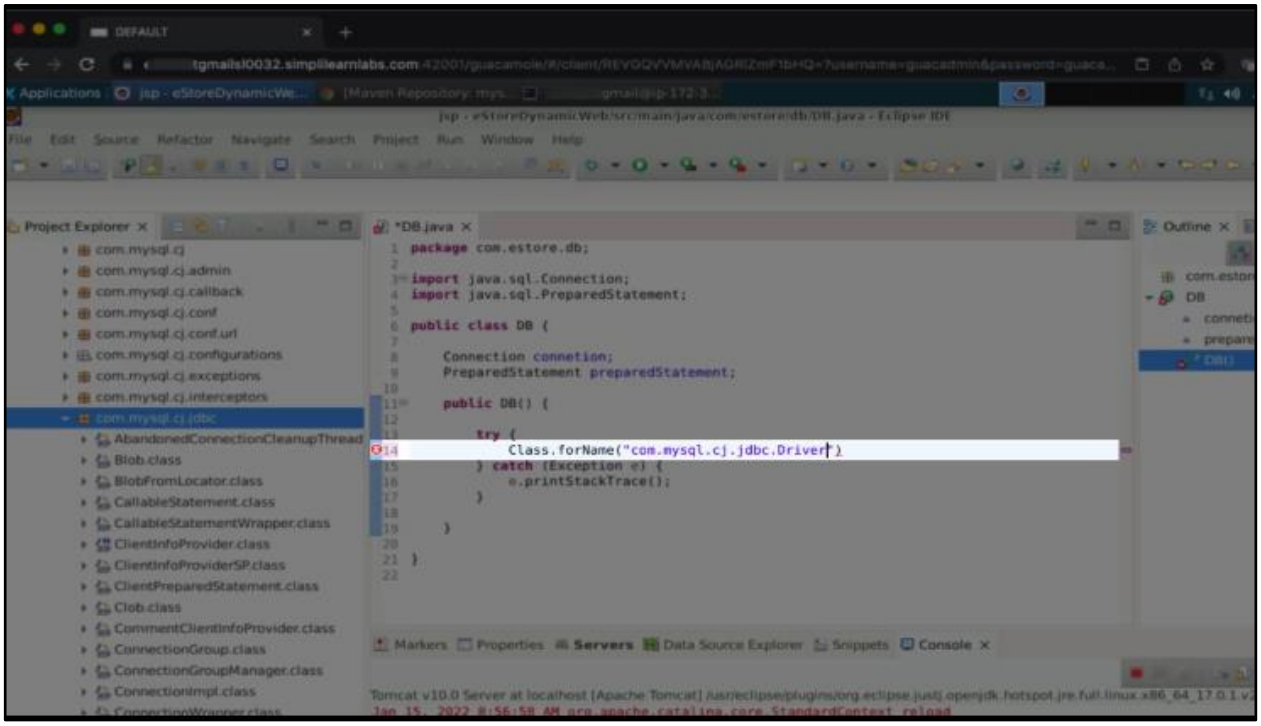
3.6 Add a **try-catch block** inside the database constructor

```
package com.estore.db;

import java.sql.Connection;
import java.sql.PreparedStatement;

public class DB {

    Connection connetion;
    PreparedStatement preparedStatement;

    public DB() {

        try {

        } catch (Exception e) {
            // TODO: handle exception
        }

    }

}
```

3.7 Add **printStackTrace();** for the exception, if any

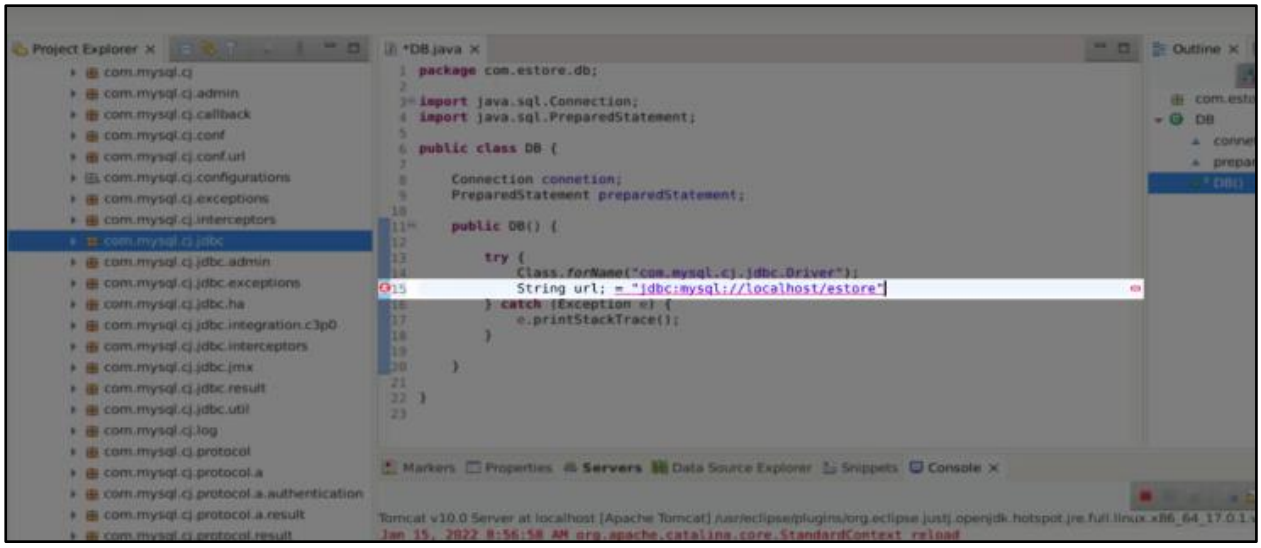
```
package com.estore.db;

import java.sql.Connection;
import java.sql.PreparedStatement;

public class DB {

    Connection connetion;
    PreparedStatement preparedStatement;

    public DB() {

        try {

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

    }

}
```

3.8 Pass the **name** of your driver

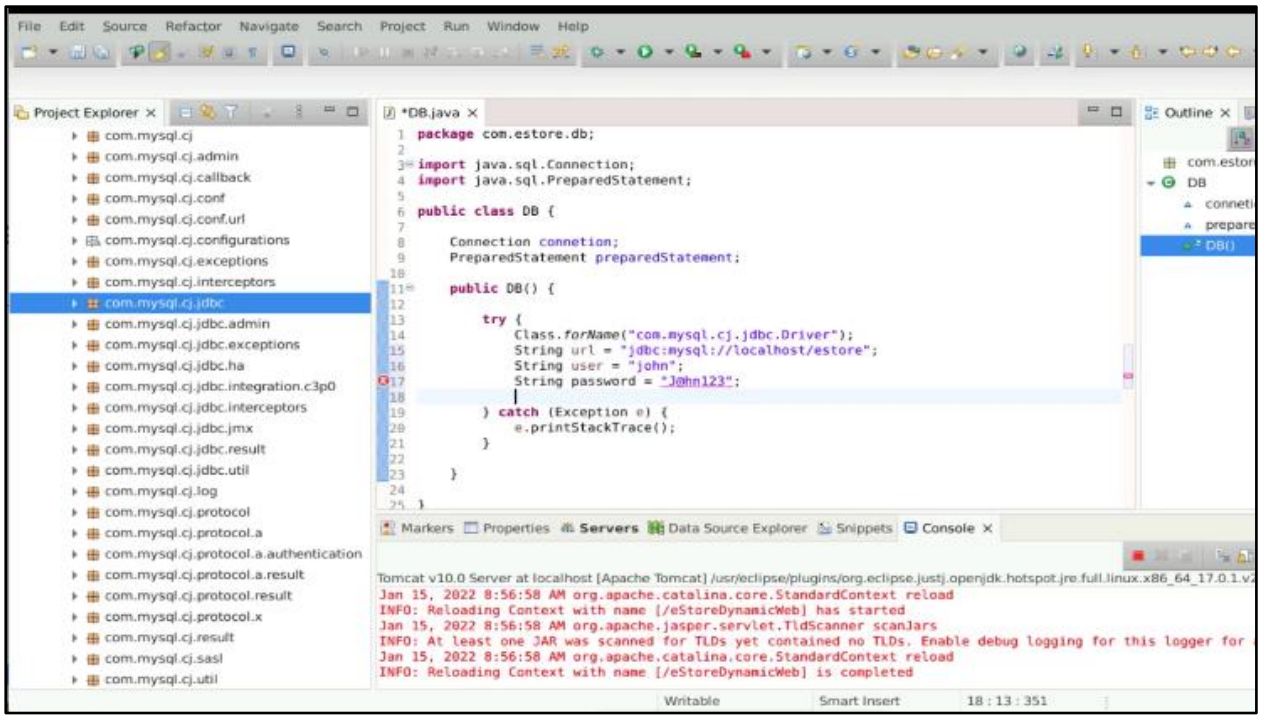


Step 4: Create a connection

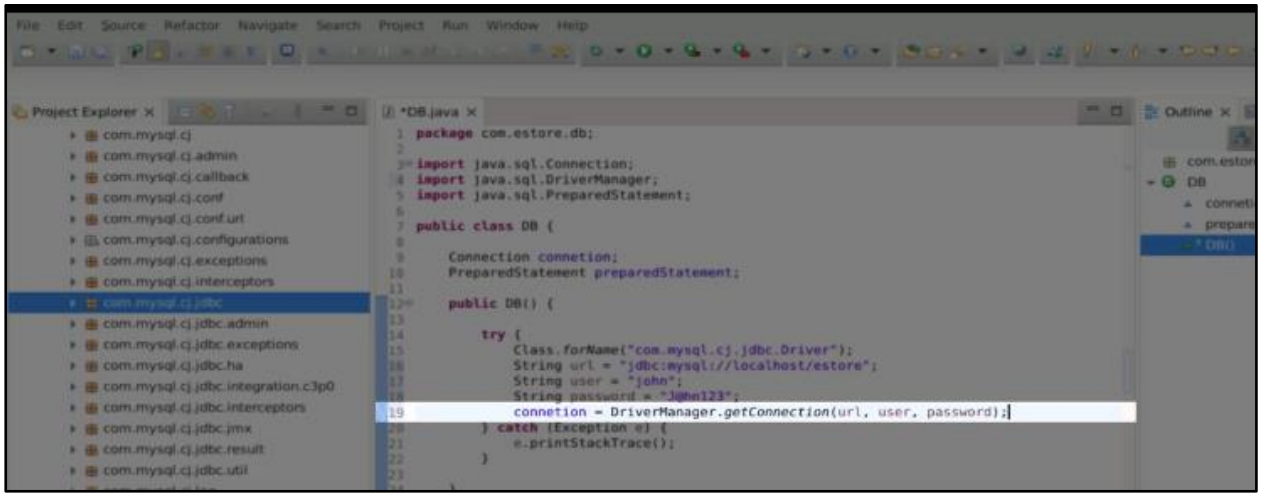
4.1 Create a **connection** using the localhost URL



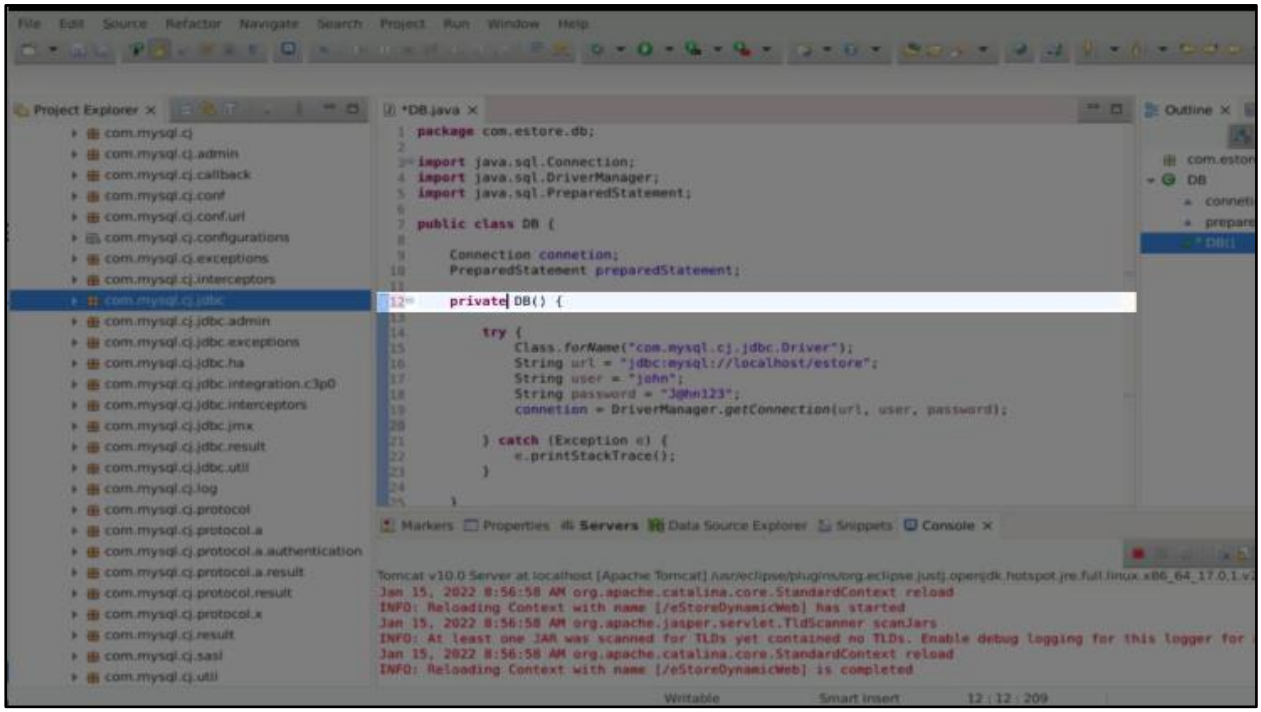
4.2 Add the string **username** and **password**



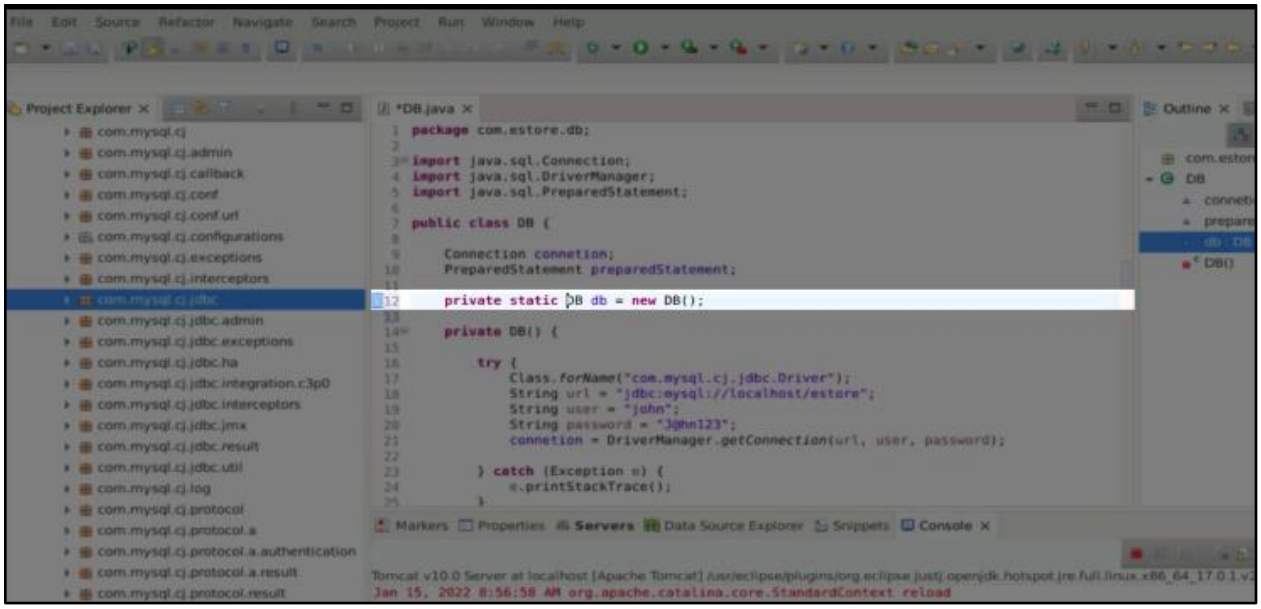
4.3 Add a **GetConnection** statement



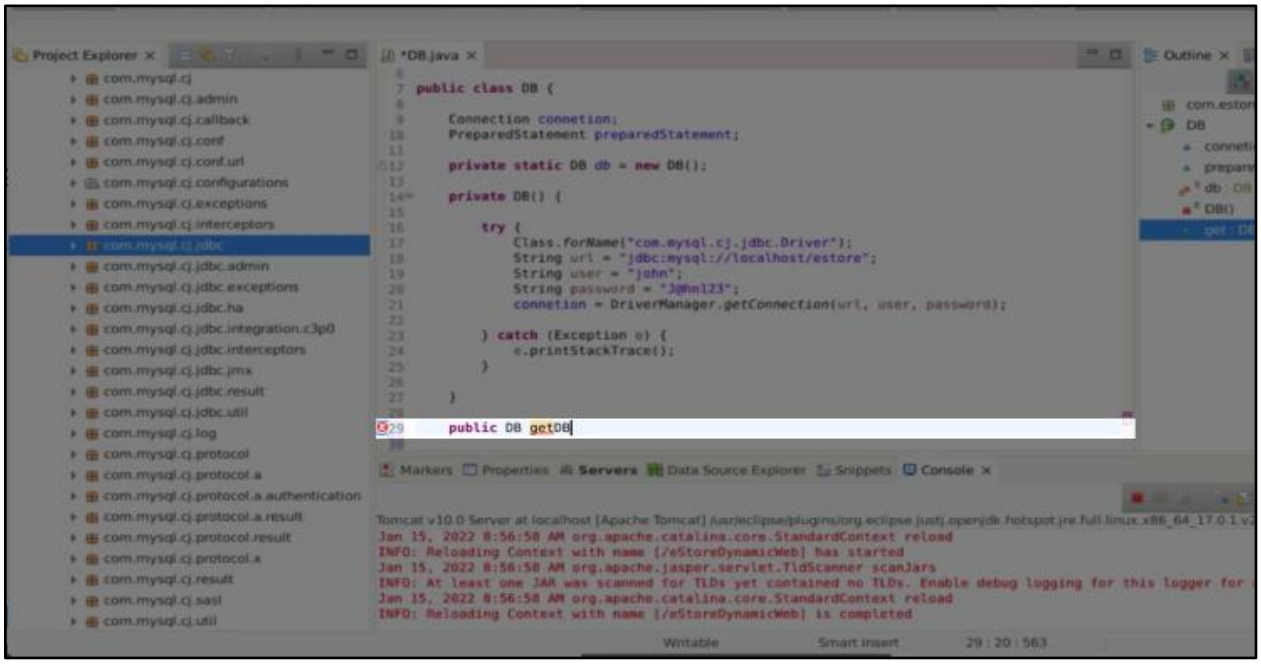
4.4 Set the **constructor** as **private**



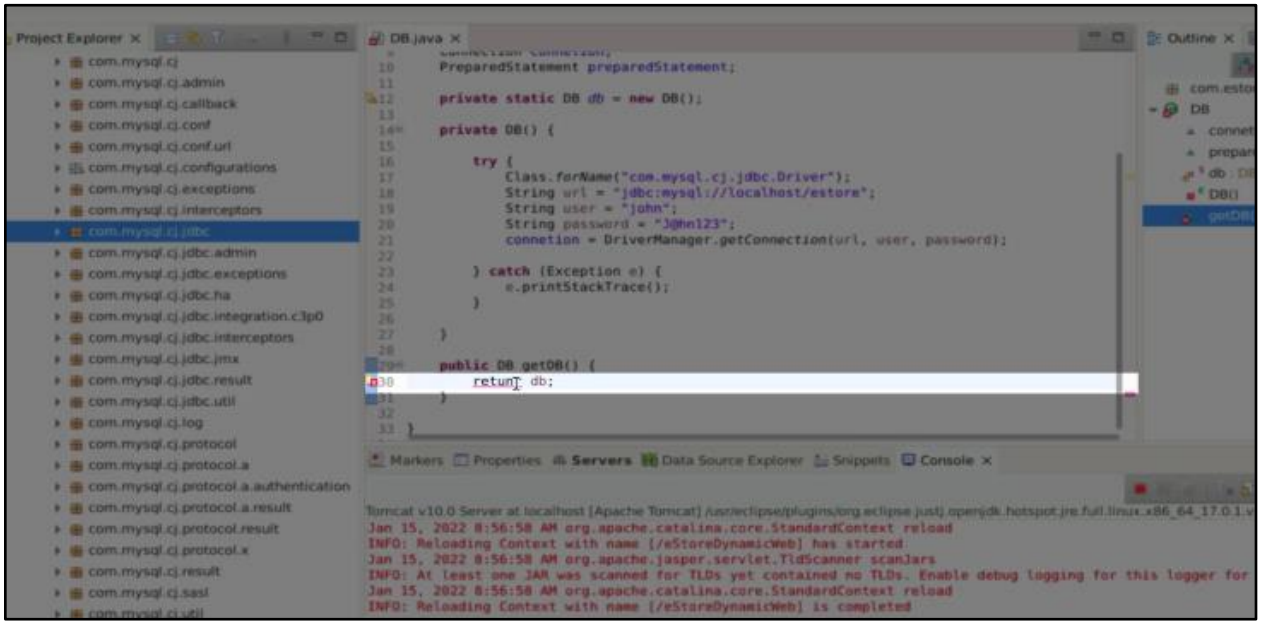
4.5 Create **a private static** object of the DB



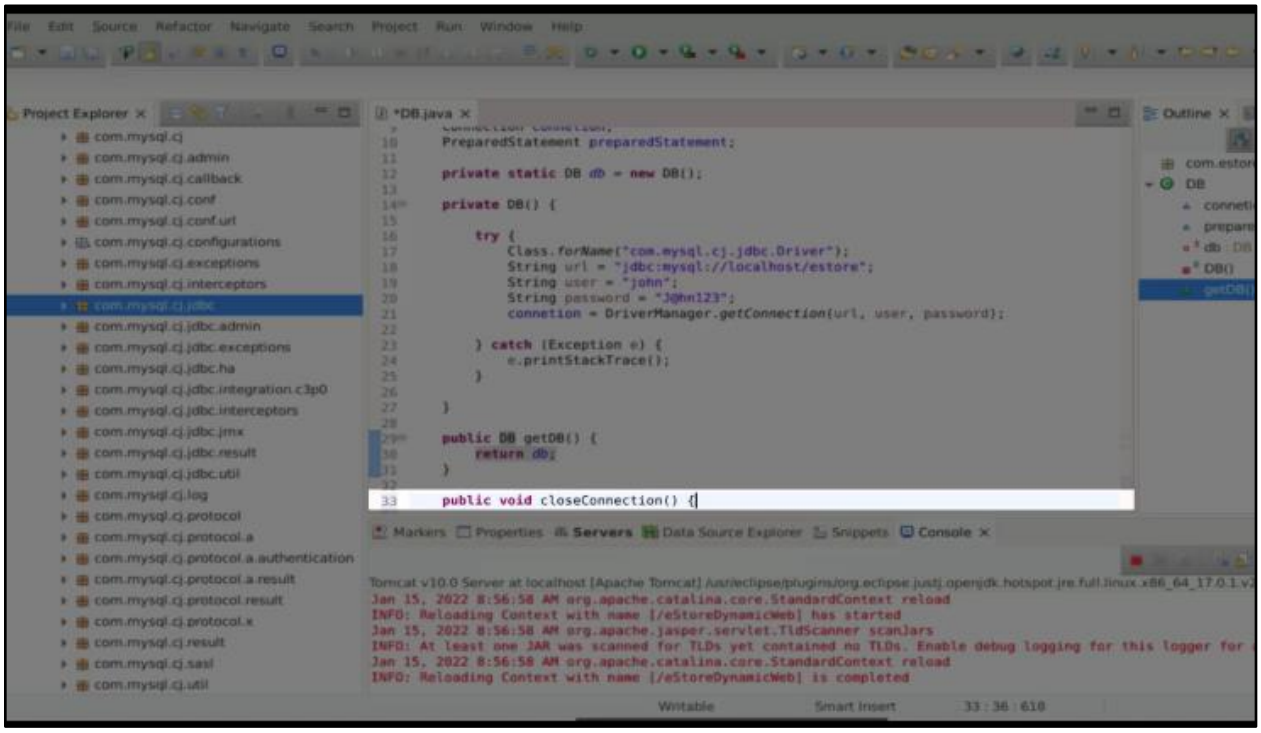
4.6 Pass the following command:



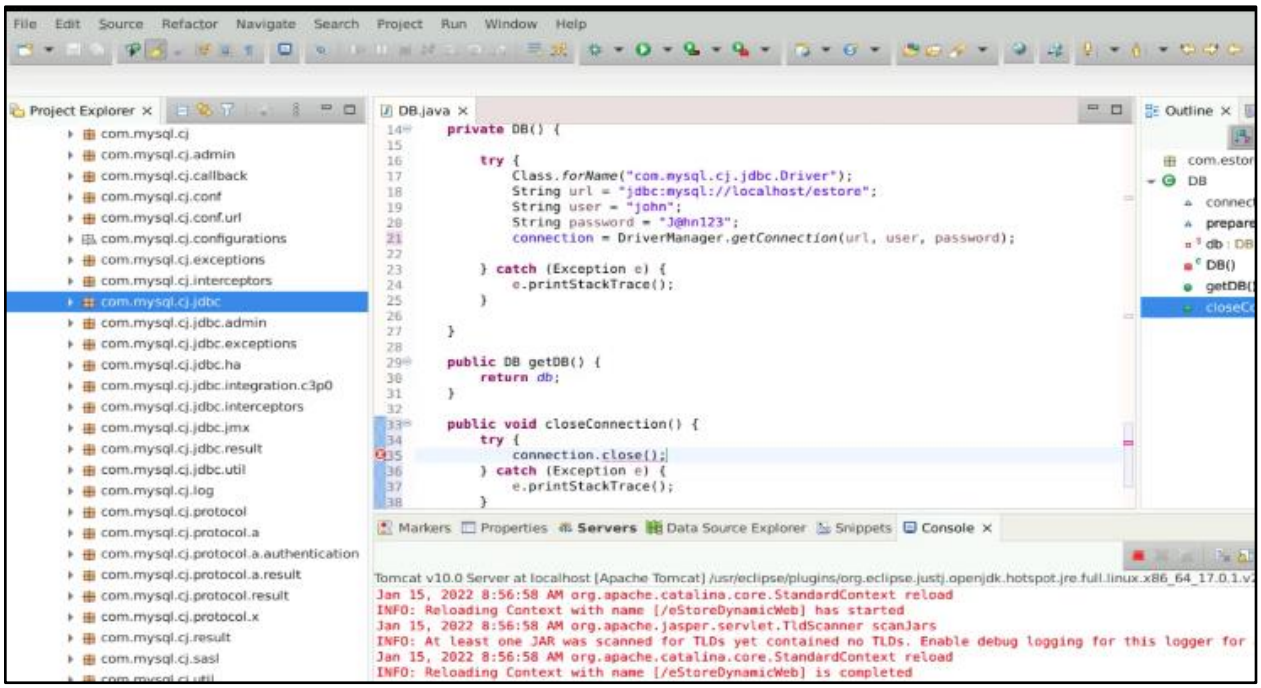
4.7 **Return** a reference to a database



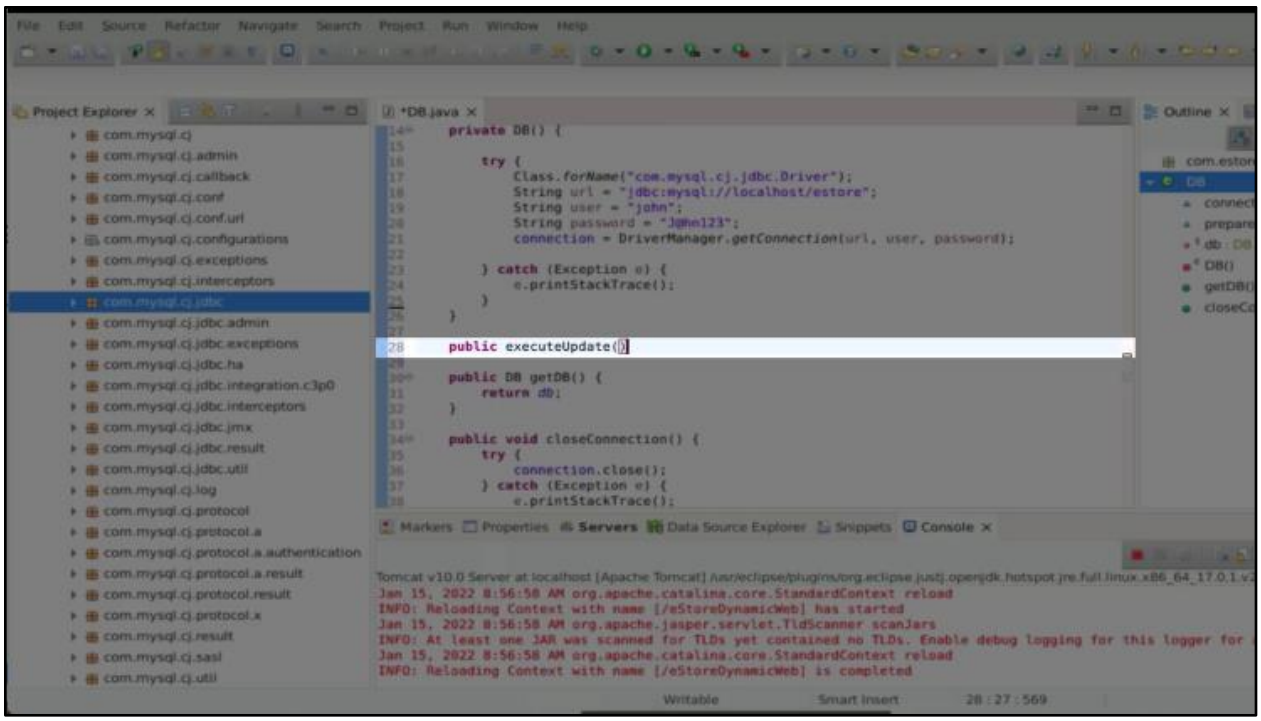
4.8 Add **closeConnection** statement



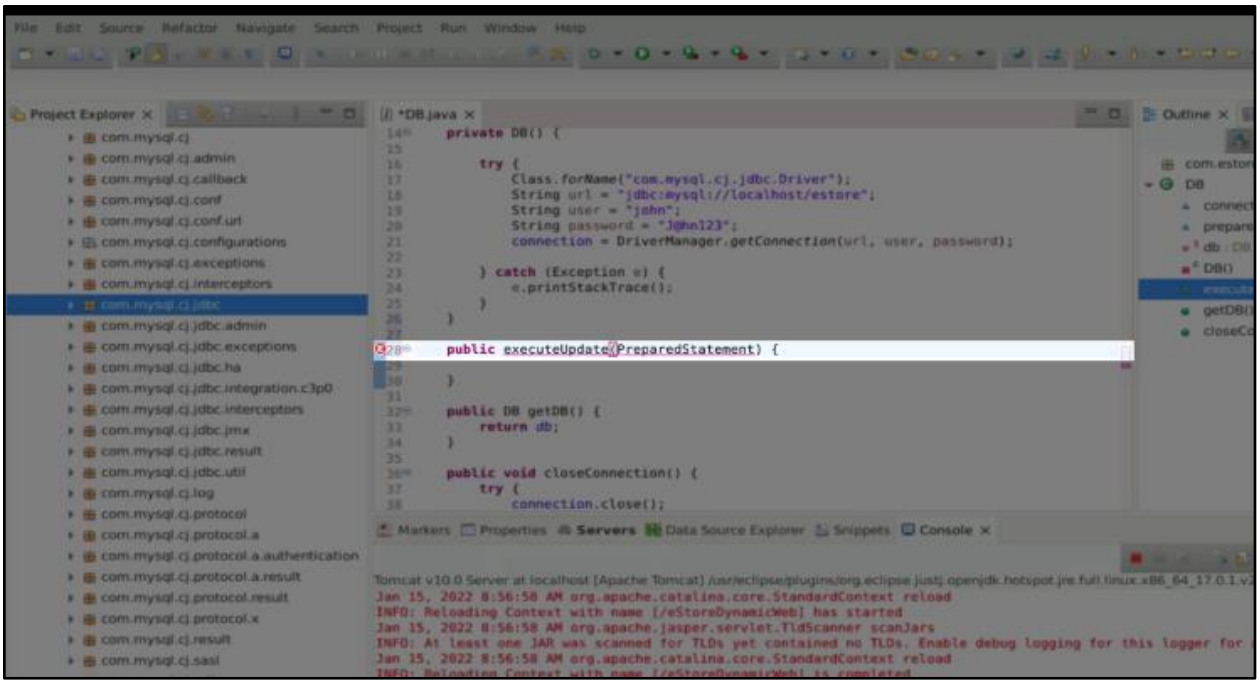
4.9 Add a **try-catch** block within it



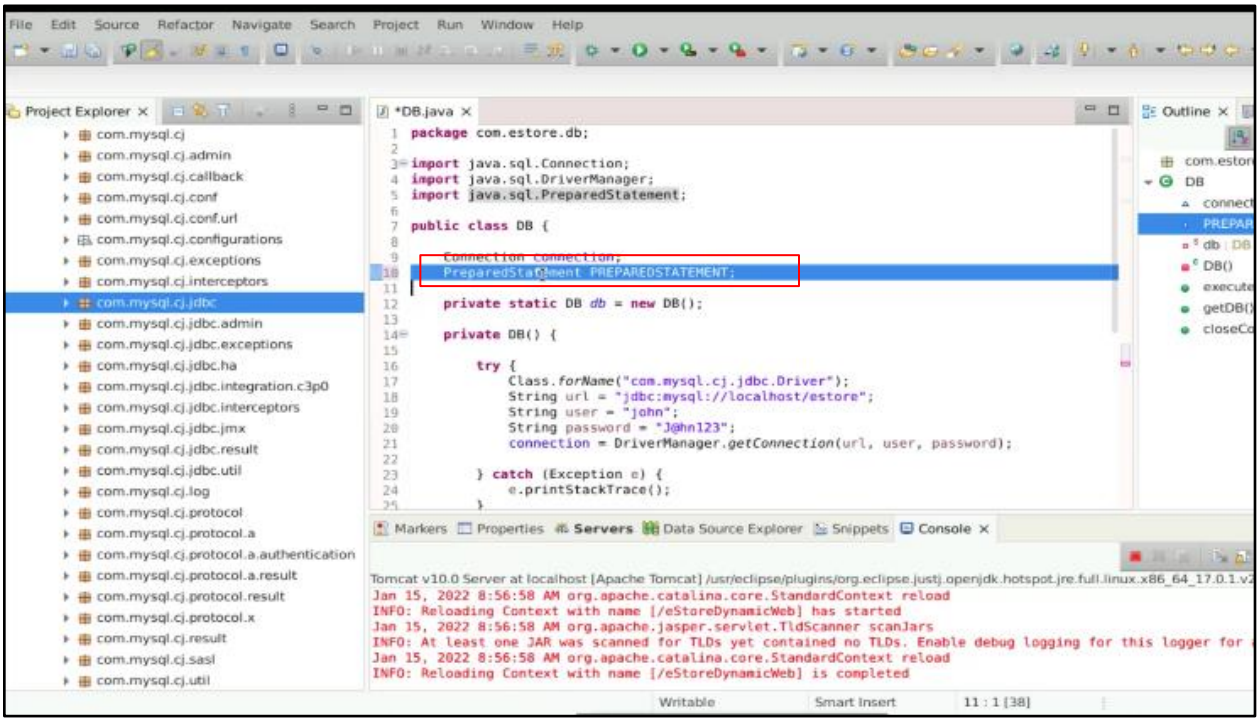
4.10 Add the **executeUpdate()** method



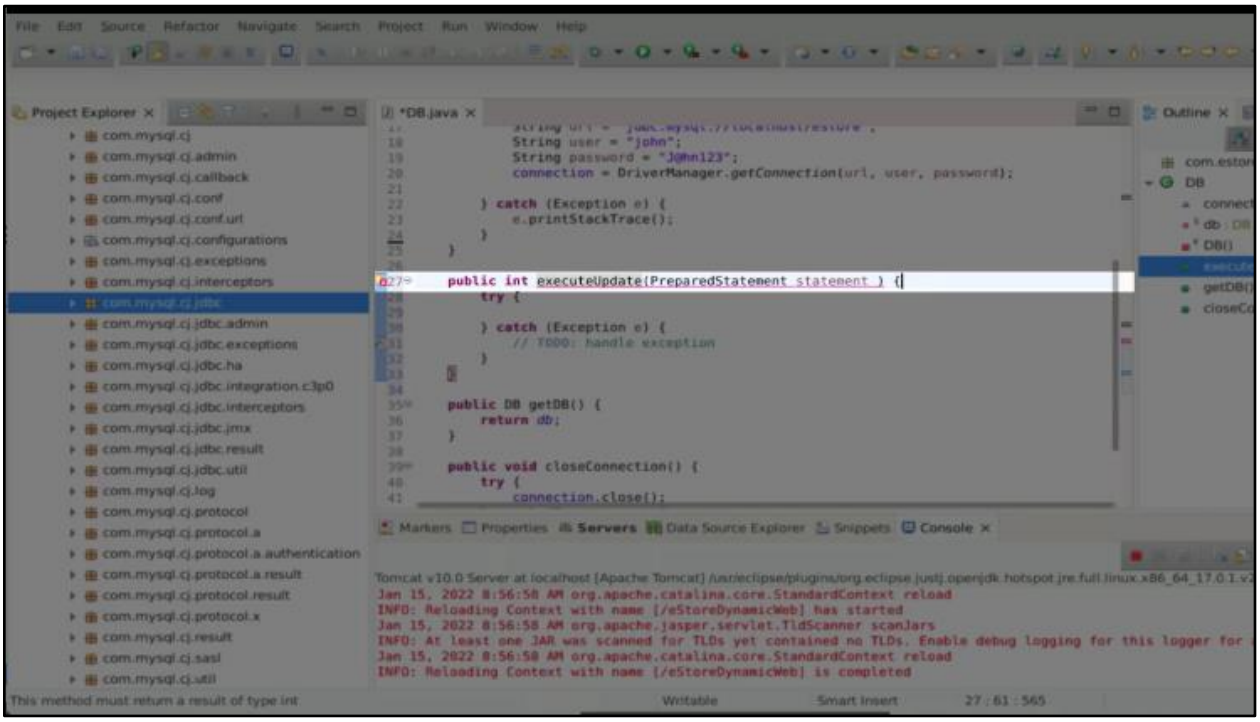
4.11 Insert a **PreparedStatement** in the **executeUpdate()** method



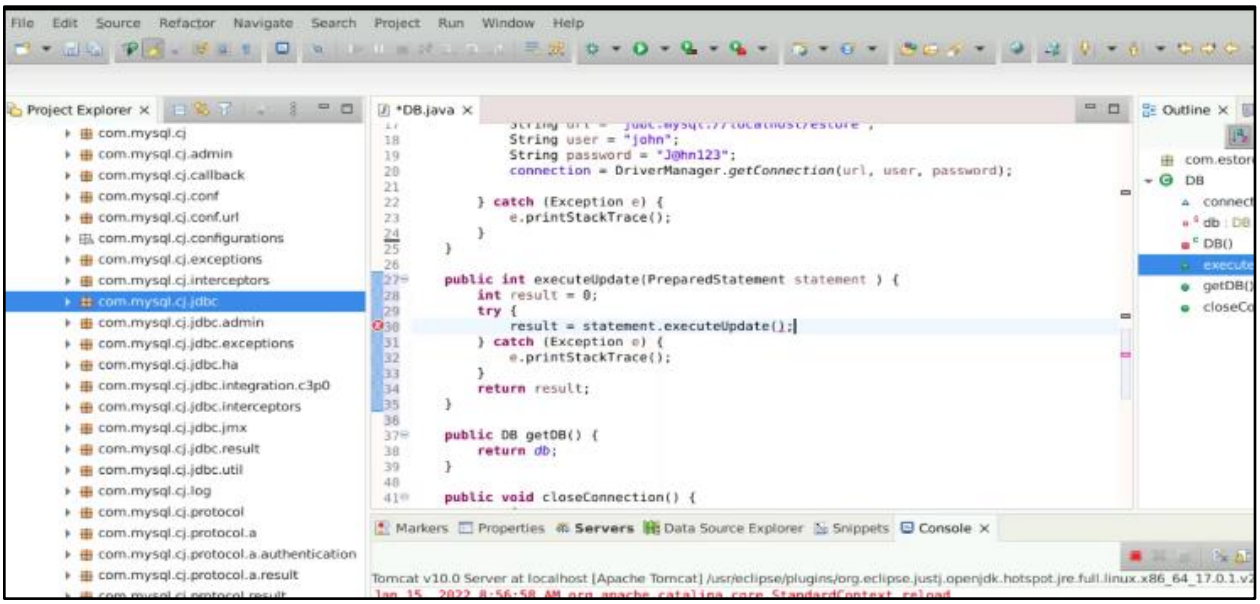
4.12 **Remove** the following statement from the **DB.java** file



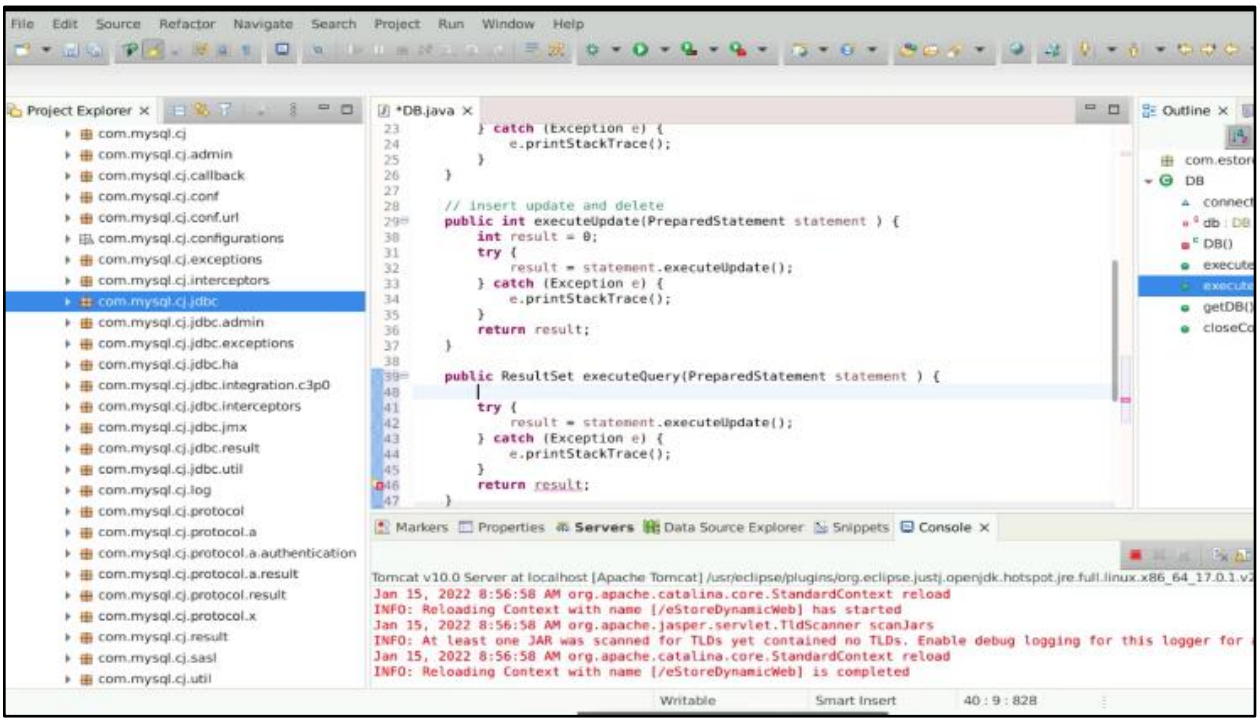
4.13 Input the statement that you want to execute



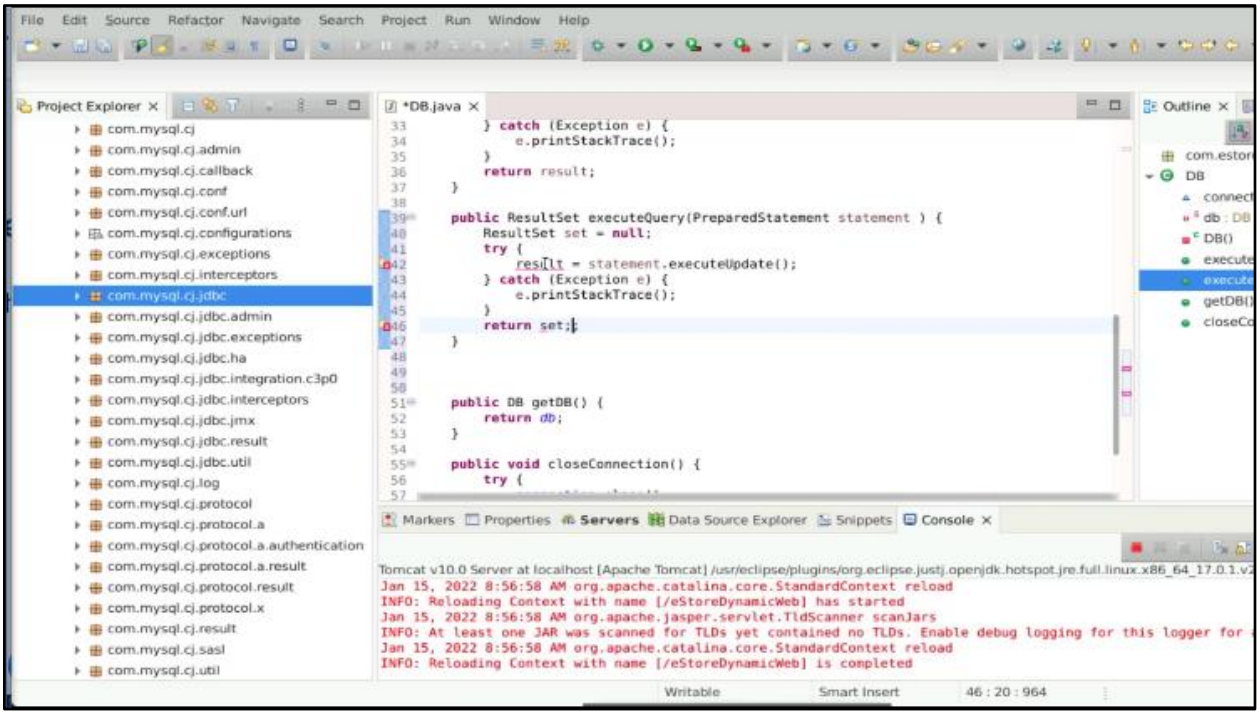
4.14 Add a **try-catch** block and **return** the result



4.15 **Add** a statement to **execute** the query

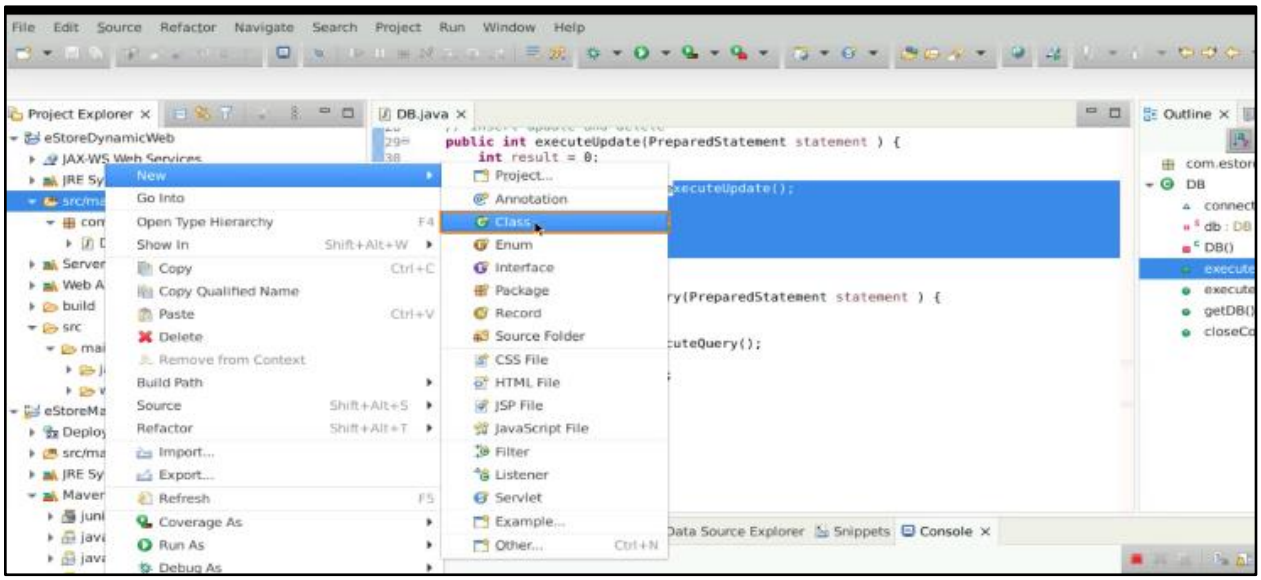


4.16 **Return** the result

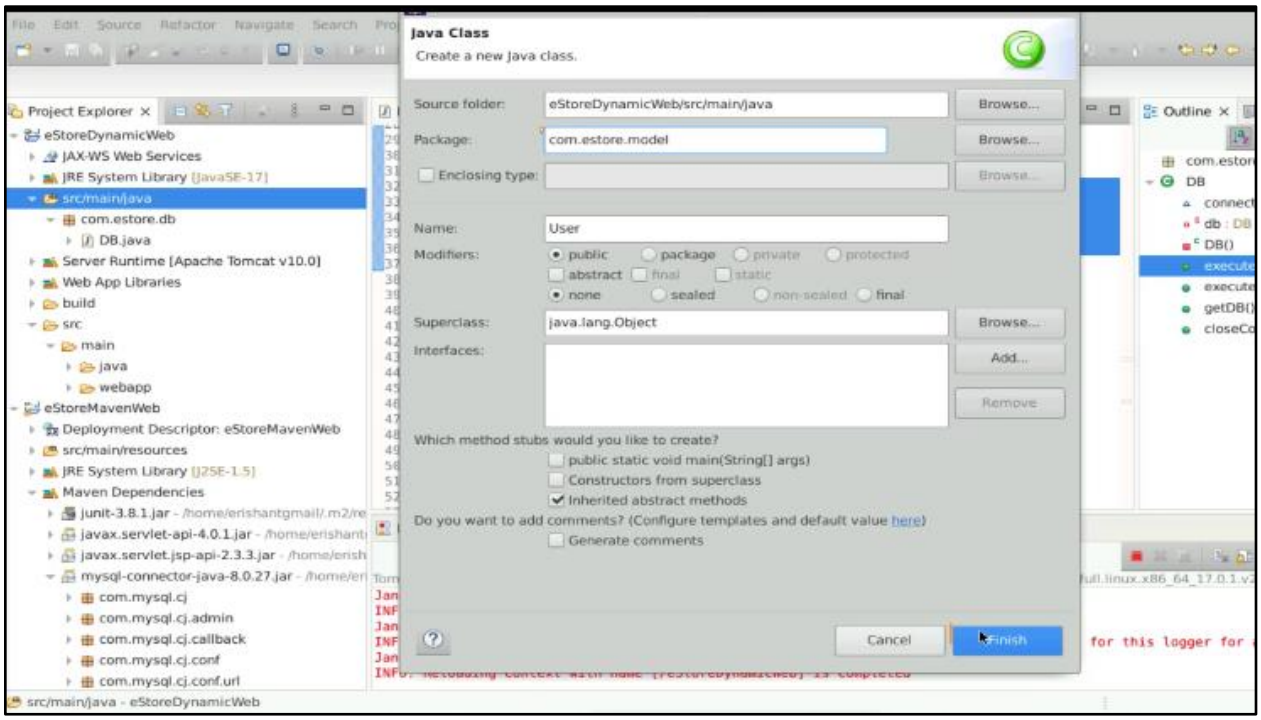


Step 5: Create another class and pass the attributes

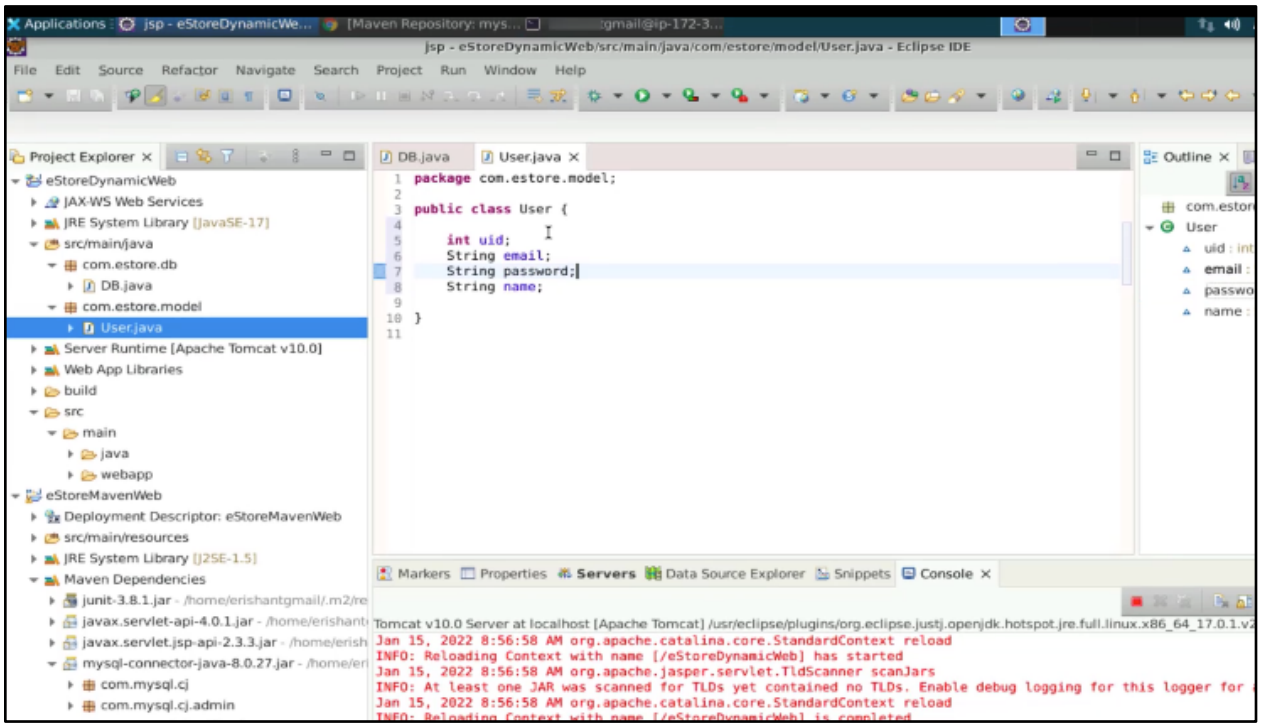
5.1 Create another **Class**



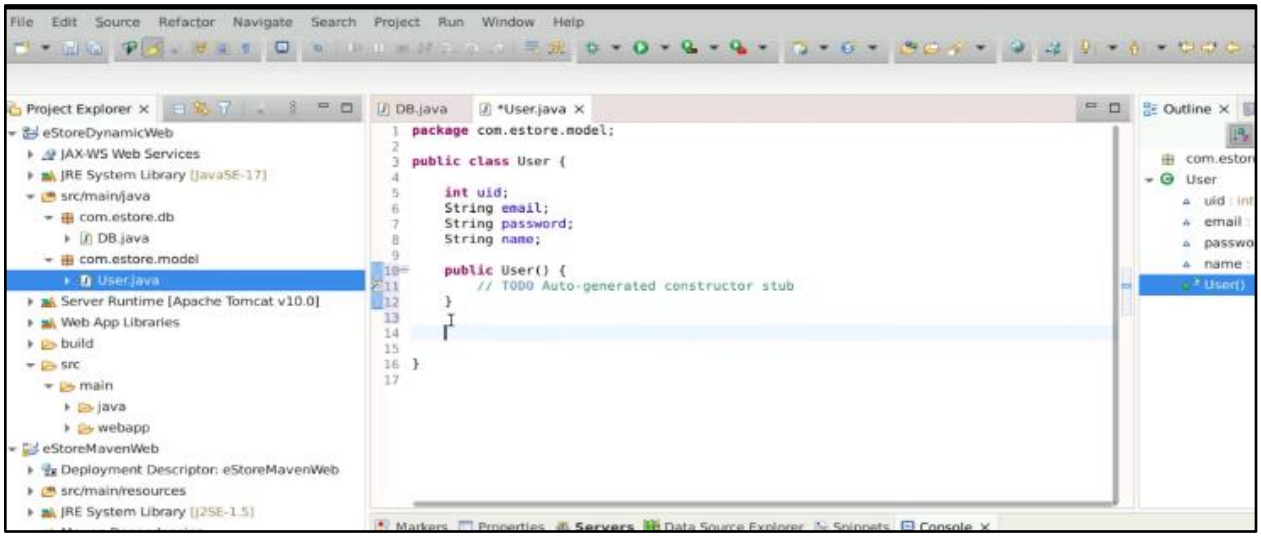
5.2 Add the **Class name** and **Package**, and click on **Finish**



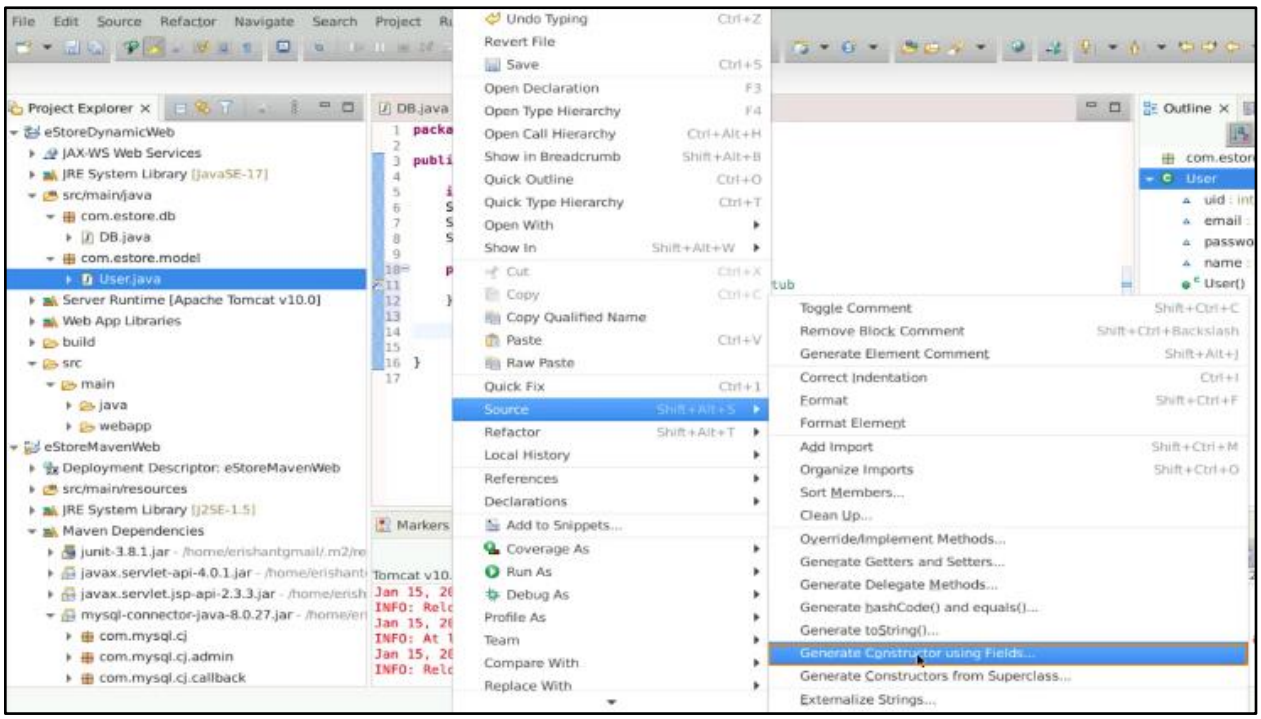
5.3 Pass the **attributes**



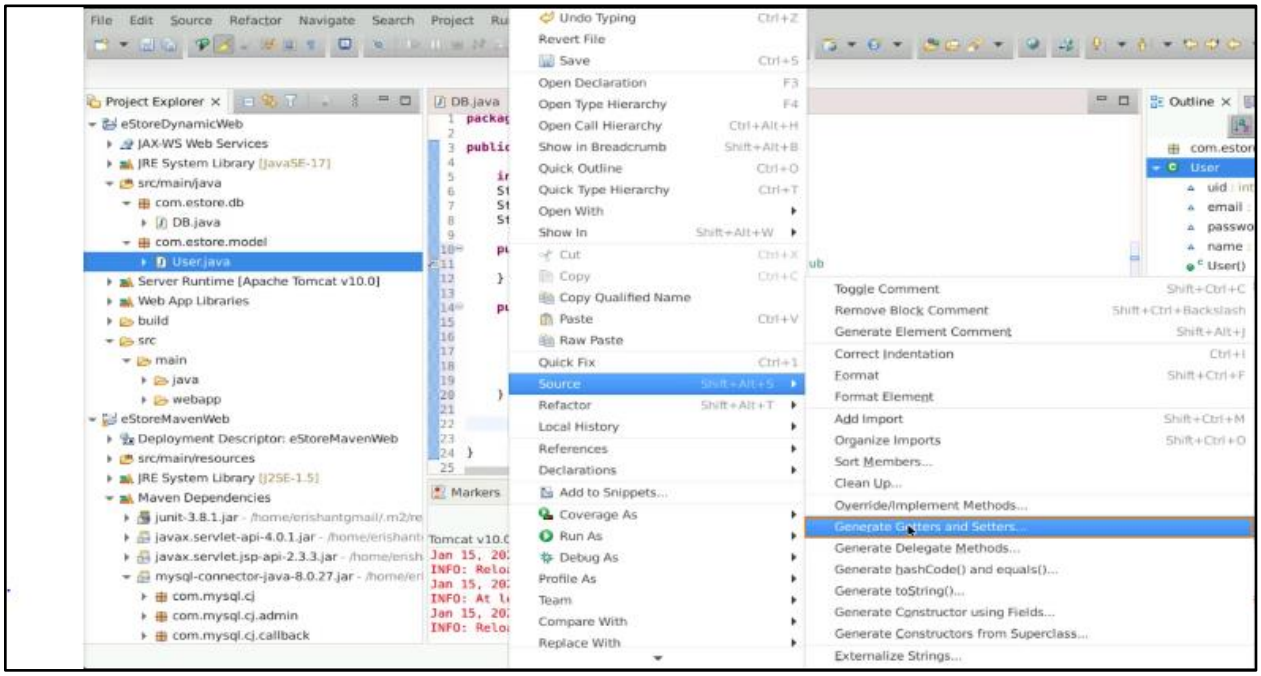
5.4 Add a **default constructor**



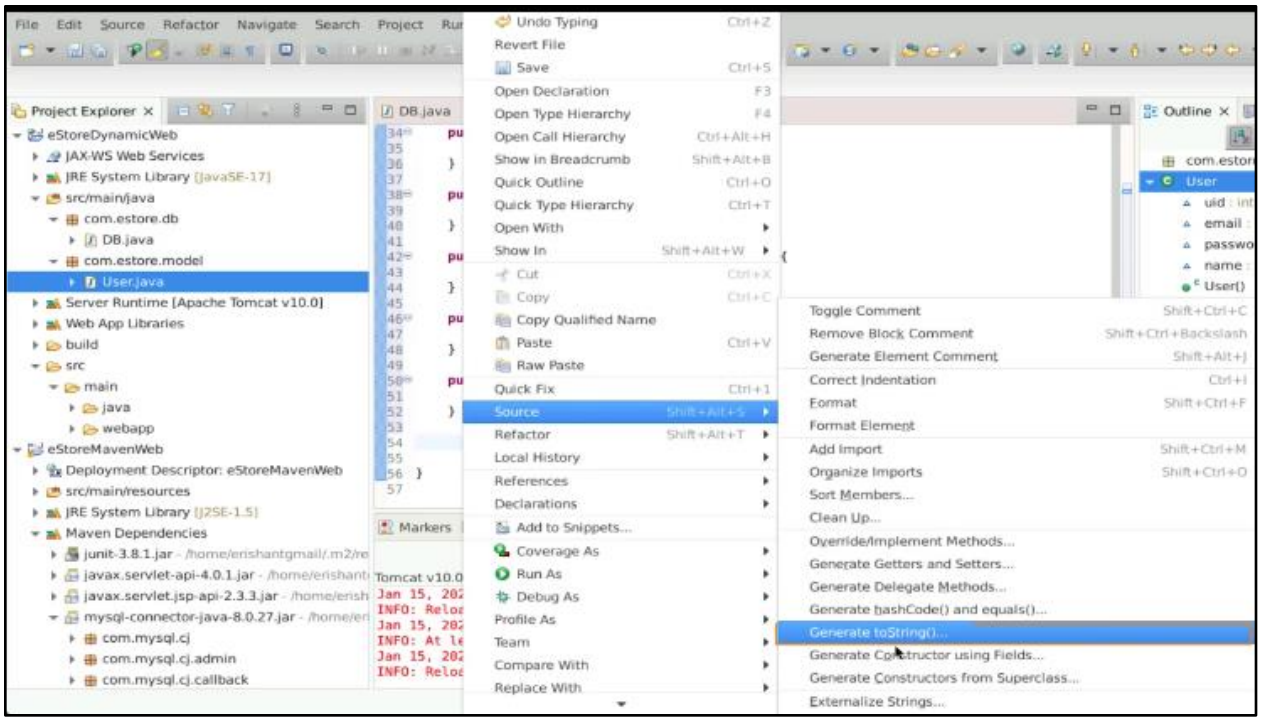
5.5 Right-click the **User.java** file, select **Source**, and click **Generate Constructor using Fields**



5.6 Right-click the **User.java** file, select **Source**, and click on **Generate Getters and Setters**

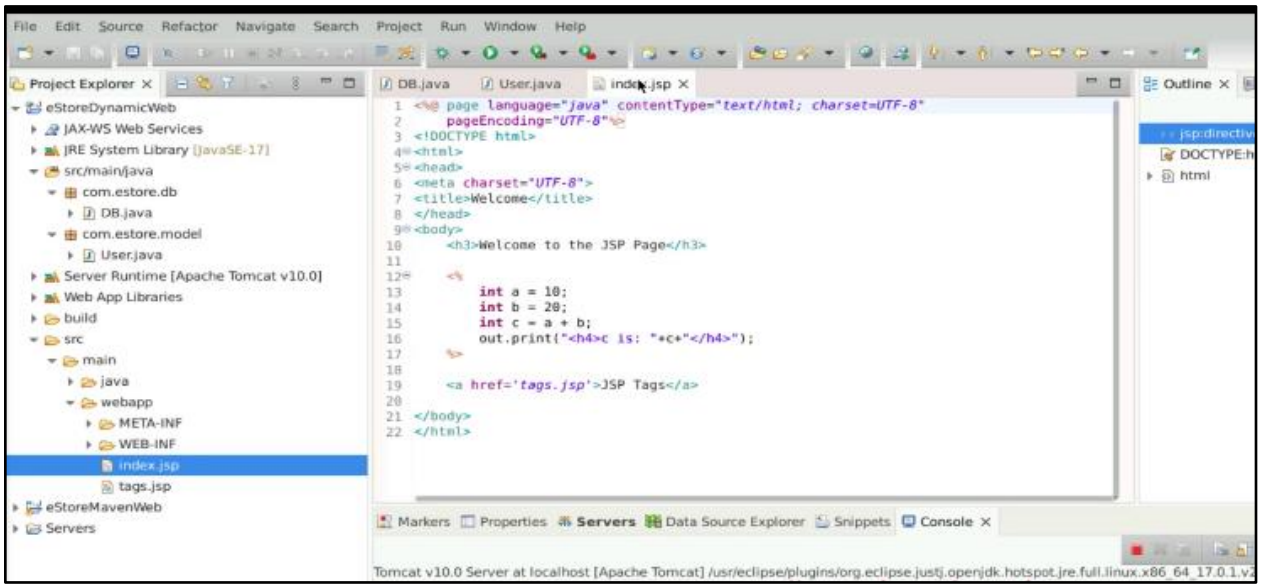


5.7 To view the data, right-click the **User.java** file, select **Source**, and click on **Generate toString()**

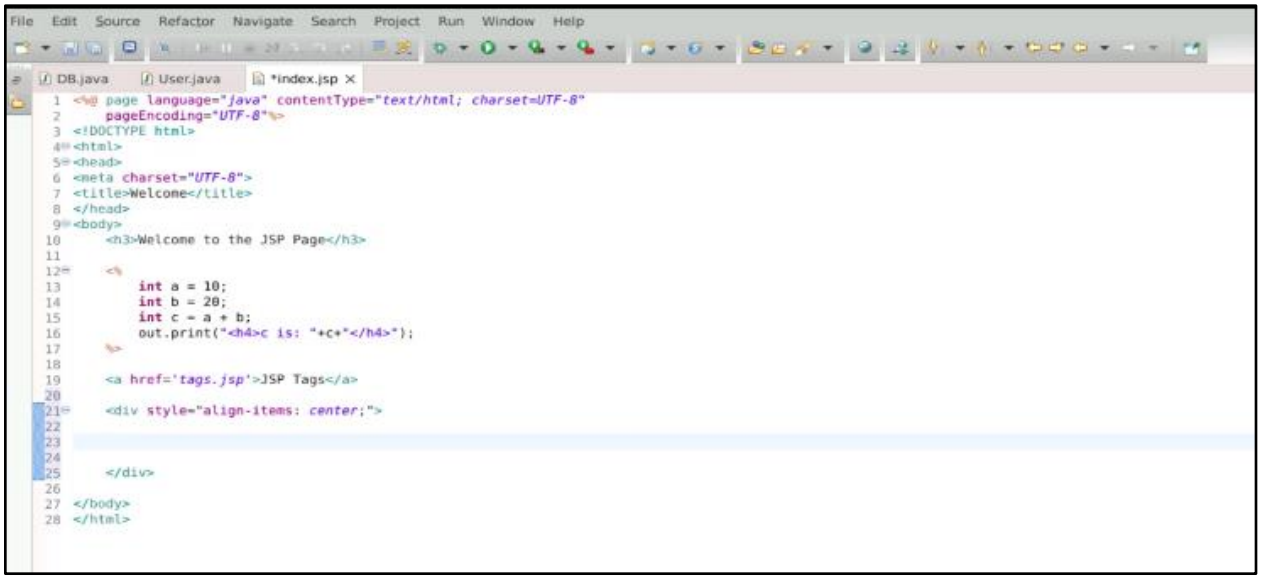


Step 6: Navigate to the index.jsp page

6.1 Open the **index.jsp** page from the folder section



6.2 Add **styling** separately in a **div** tag



6.3 Create a form inside the div tag

```
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Welcome</title>
</head>
<body>
    <h3>Welcome to the JSP Page</h3>

    <%
        int a = 10;
        int b = 20;
        int c = a + b;
        out.print("<h4>c is: "+c+"</h4>");
    %>

    <a href='tags.jsp'>JSP Tags</a>

    <div style="align-items: center;">

        <form>

        </form>

    </div>

</body>
</html>
```

6.4 Specify the action and method

```
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Welcome</title>
</head>
<body>
    <h3>Welcome to the JSP Page</h3>

    <%
        int a = 10;
        int b = 20;
        int c = a + b;
        out.print("<h4>c is: "+c+"</h4>");
    %>

    <a href='tags.jsp'>JSP Tags</a>

    <div style="align-items: center;">

        <form action="" method="post">

        </form>

    </div>

</body>
</html>
```

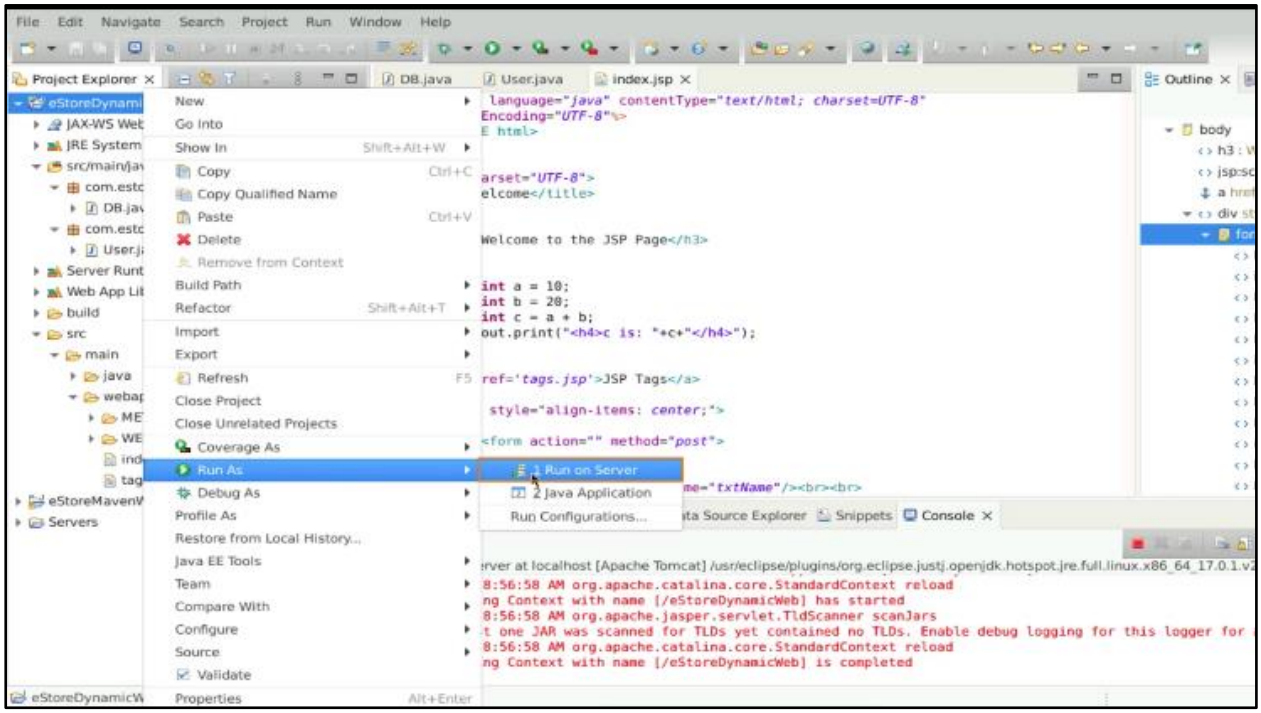
6.5 Design the form using different structures

```
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Welcome</title>
</head>
<body>
    <h3>Welcome to the JSP Page</h3>

    <%
        int a = 10;
        int b = 20;
        int c = a + b;
        out.print("<h4>c is: "+c+"</h4>");
    %>

    <a href='tags.jsp'>JSP Tags</a>

    <div style="align-items: center;">

        <form action="" method="post">

            Enter Name: <br>
            <input type="text" name="txtName"/><br><br>

            Enter Email:<br>
            <input type="text" name="txtEmail"/> <br><br>

            Enter Password:<br>
            <input type="password" name="txtPassword"/><br>


        </form>

    </div>
```

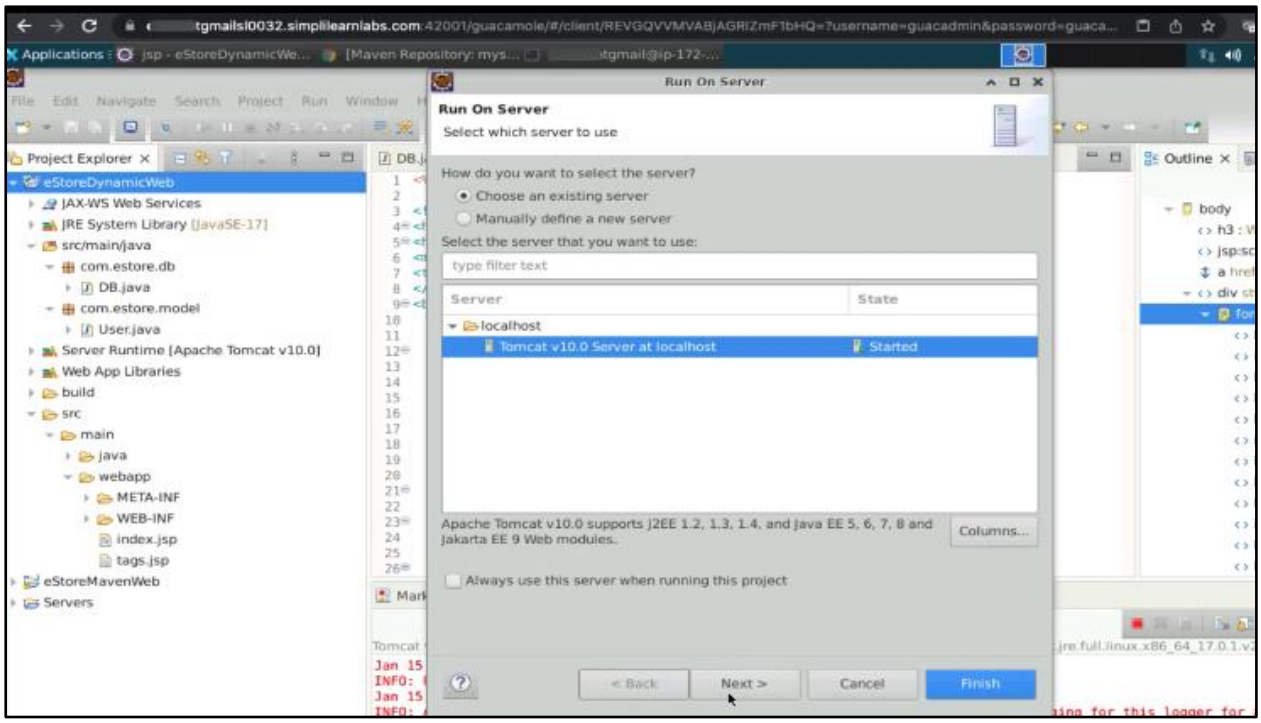
6.6 Add a submit button and save the file

```
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
<meta charset="UTF-8">
<title>Welcome</title>
</head>
<body>
    <h3>Welcome to the JSP Page</h3>

    <%
        int a = 10;
        int b = 20;
        int c = a + b;
        out.print("<h4>c is: "+c+"</h4>");
    %>

    <a href='tags.jsp'>JSP Tags</a>

    <div style="align-items: center;">

        <form action="" method="post">

            Enter Name: <br>
            <input type="text" name="txtName"/><br><br>

            Enter Email:<br>
            <input type="text" name="txtEmail"/> <br><br>

            Enter Password:<br>
            <input type="password" name="txtPassword"/><br>

            <input type="submit" value="Register">

        </form>

    </div>
```

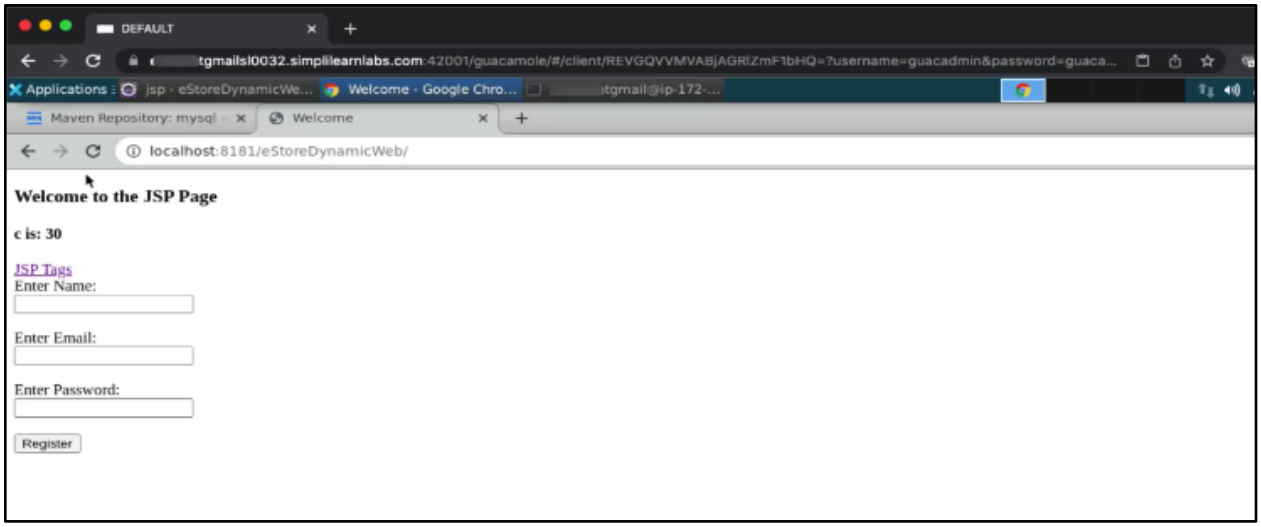
6.7 Right-click the project file, select **Run As**, and click **Run on Server**



6.8 Choose **Tomcat 10 Server at localhost** and click **Finish**



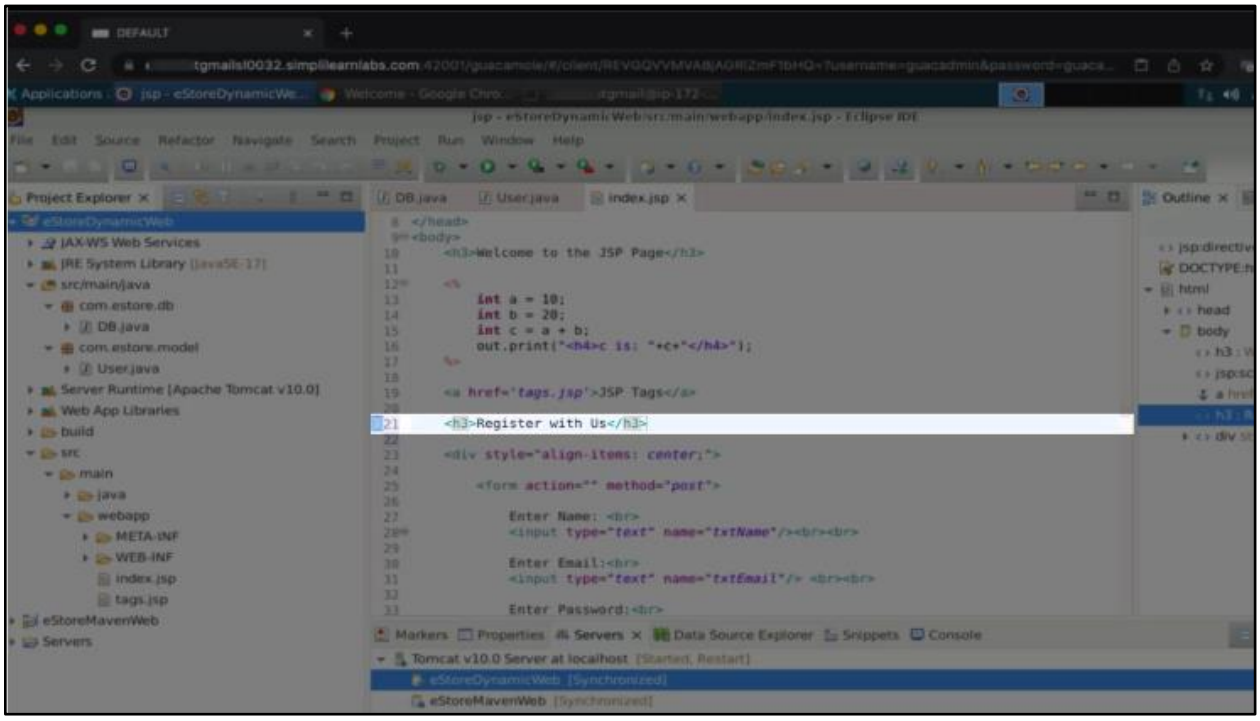
6.9 Go to the browser and navigate to **localhost:8181/eStoreDynamicWeb**



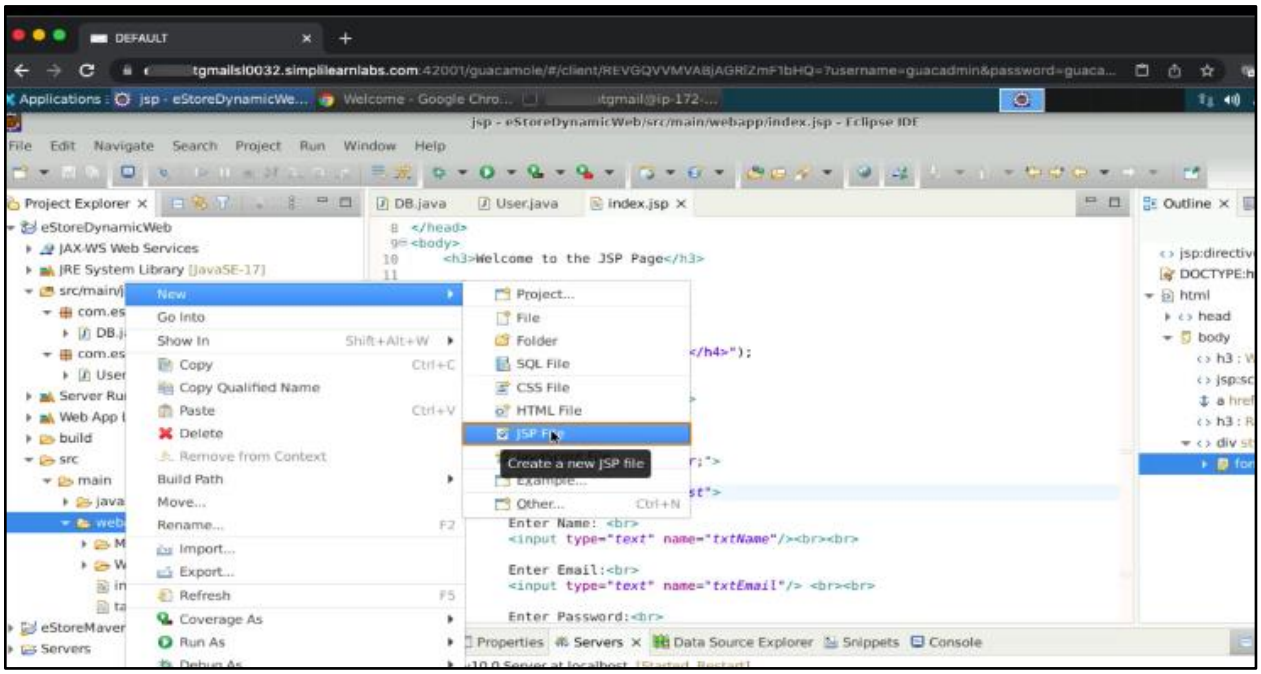
A simple form of the JSP page can be seen containing the fields **Name**, **Email**, and **Password** and the **Register** button.

Step 7: Add a new JSP file

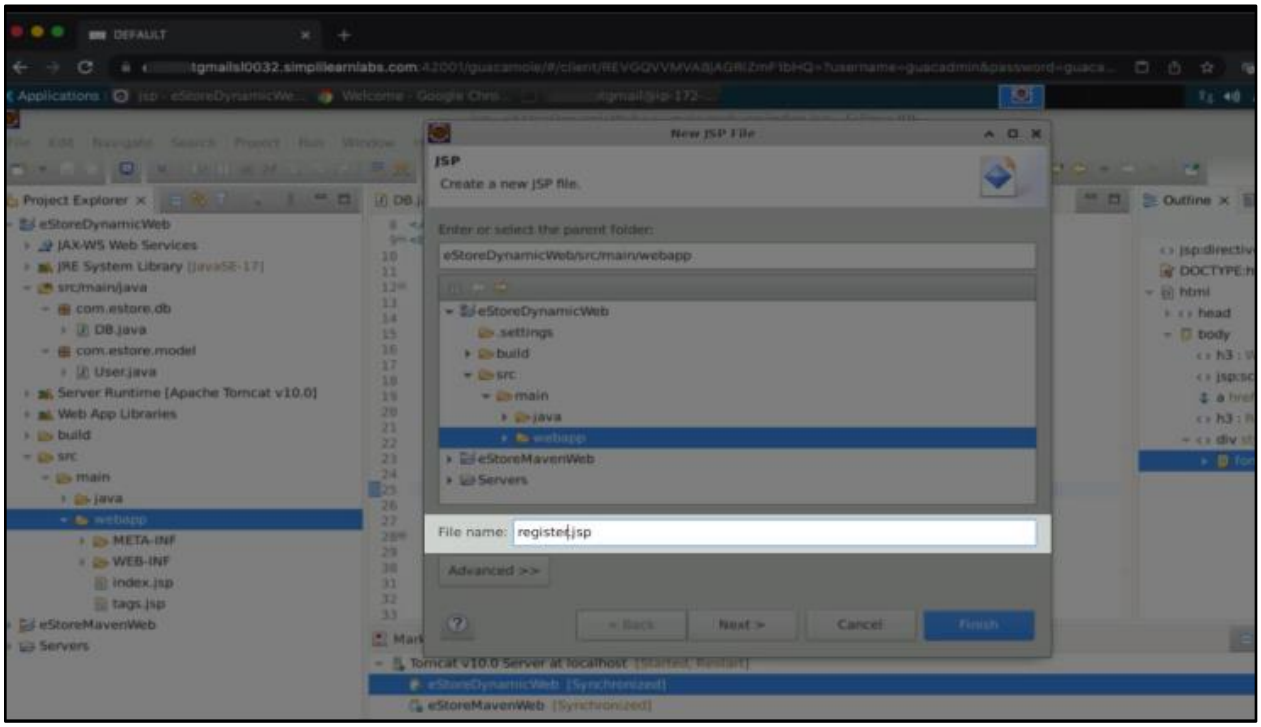
7.1 Add an **h3 tag** in the **index.jsp** file



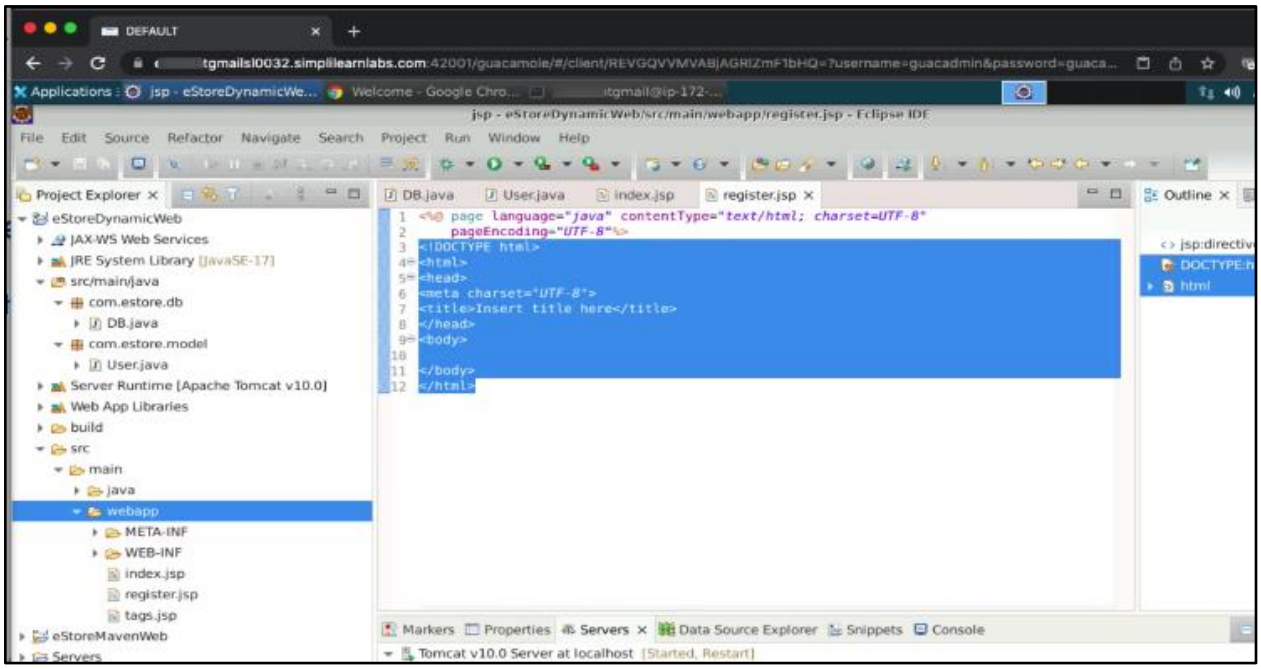
7.2 To add an action, right-click on the **webapp**, select **New**, and select **JSP File**



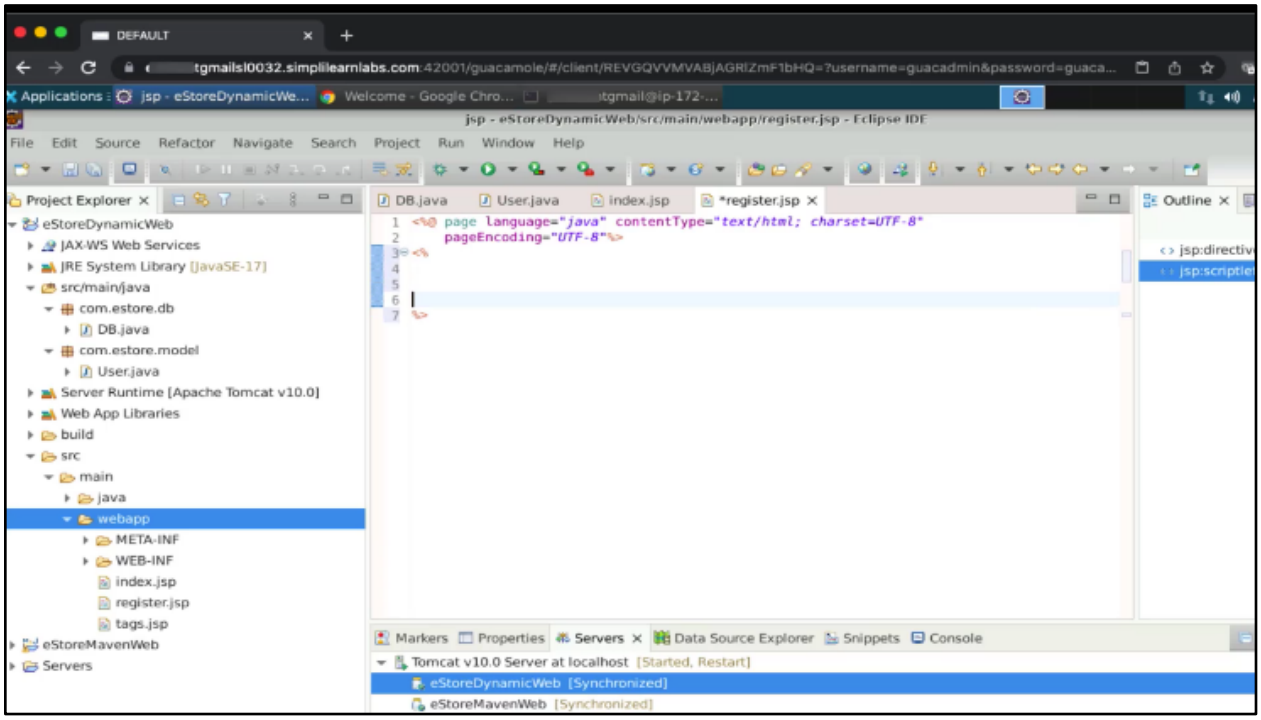
7.3 Name the file **register.jsp**



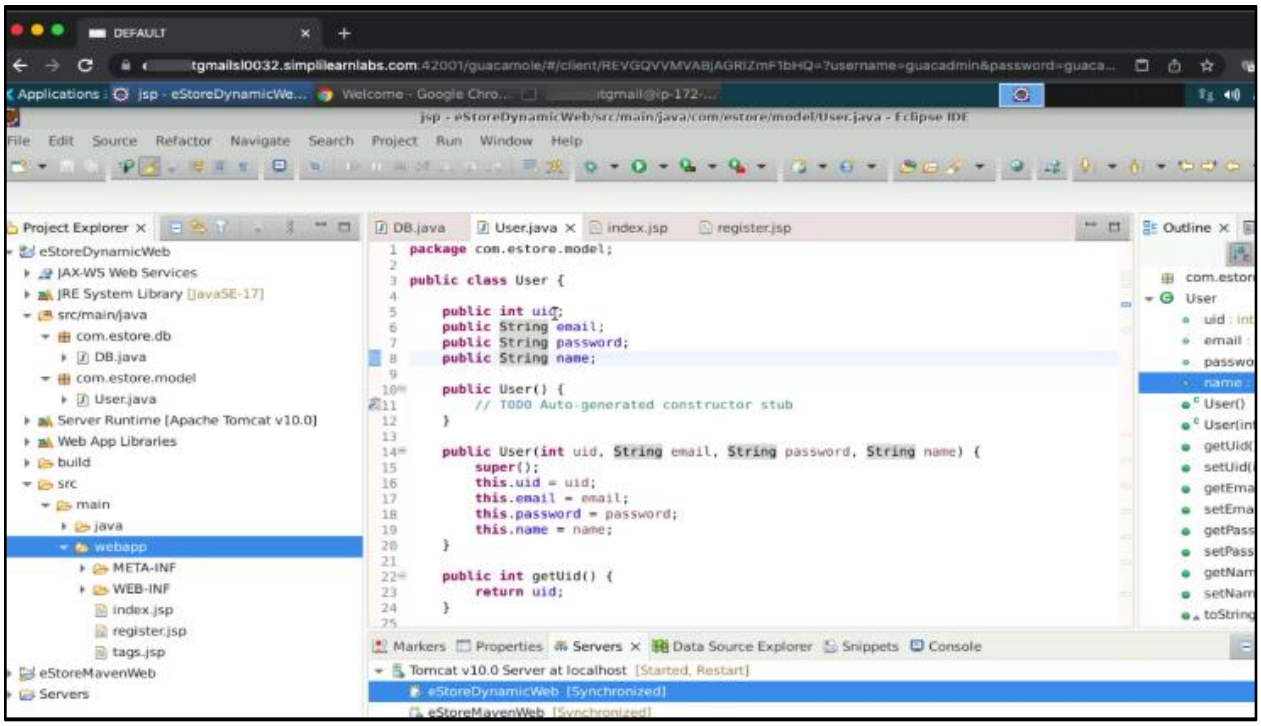
7.4 Eliminate HTML parts from the **register.jsp** file



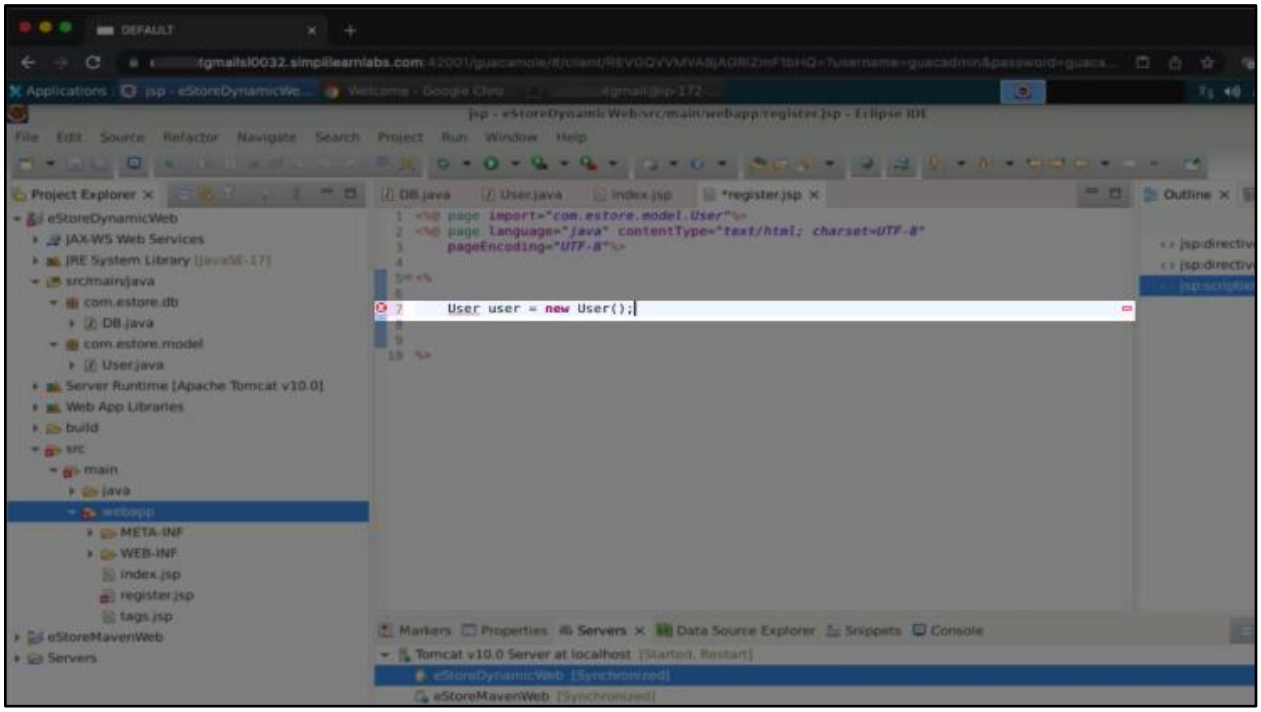
7.5 Create a **scriptlet** tag



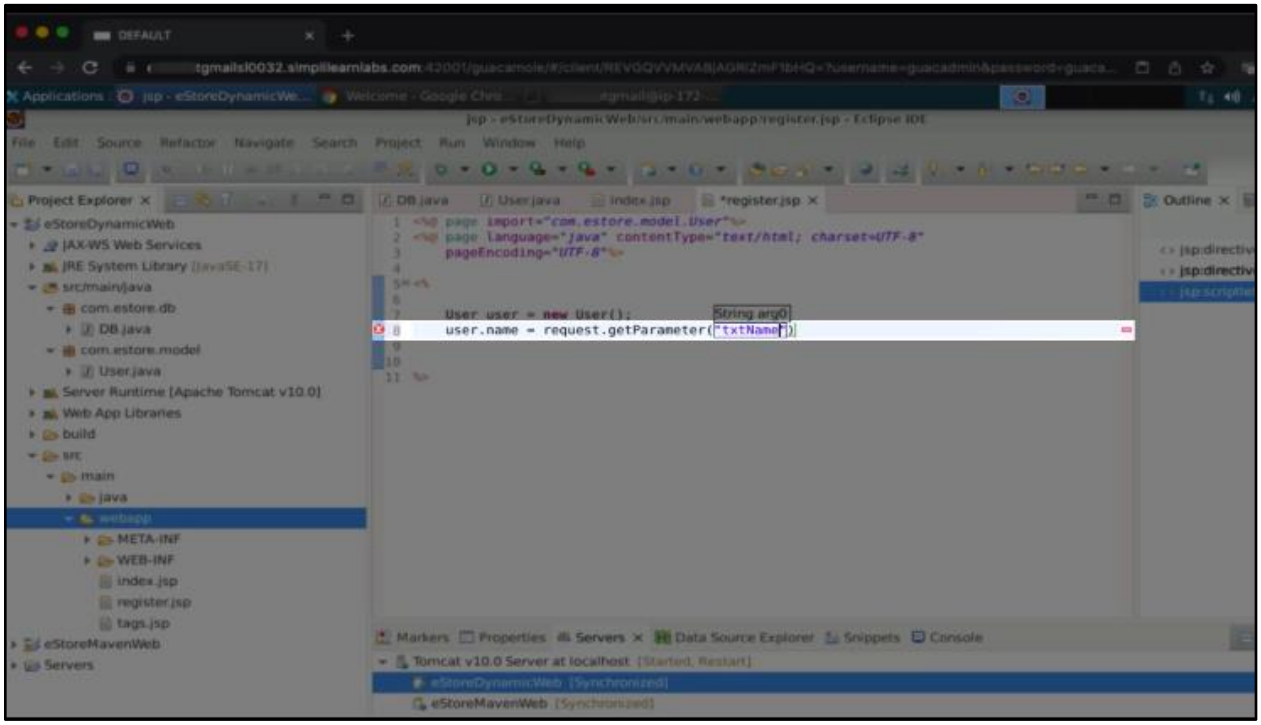
7.6 Change the attributes to **public**



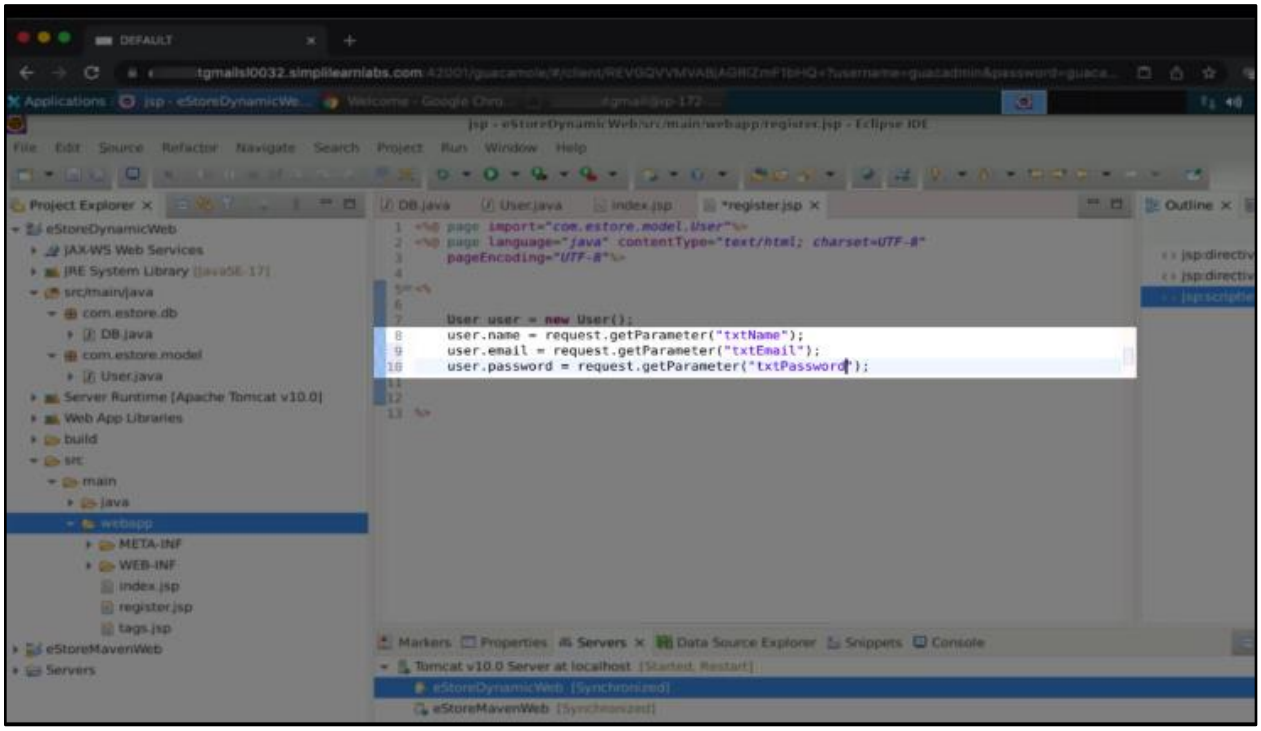
7.7 Create a **new User** object in the register.jsp page



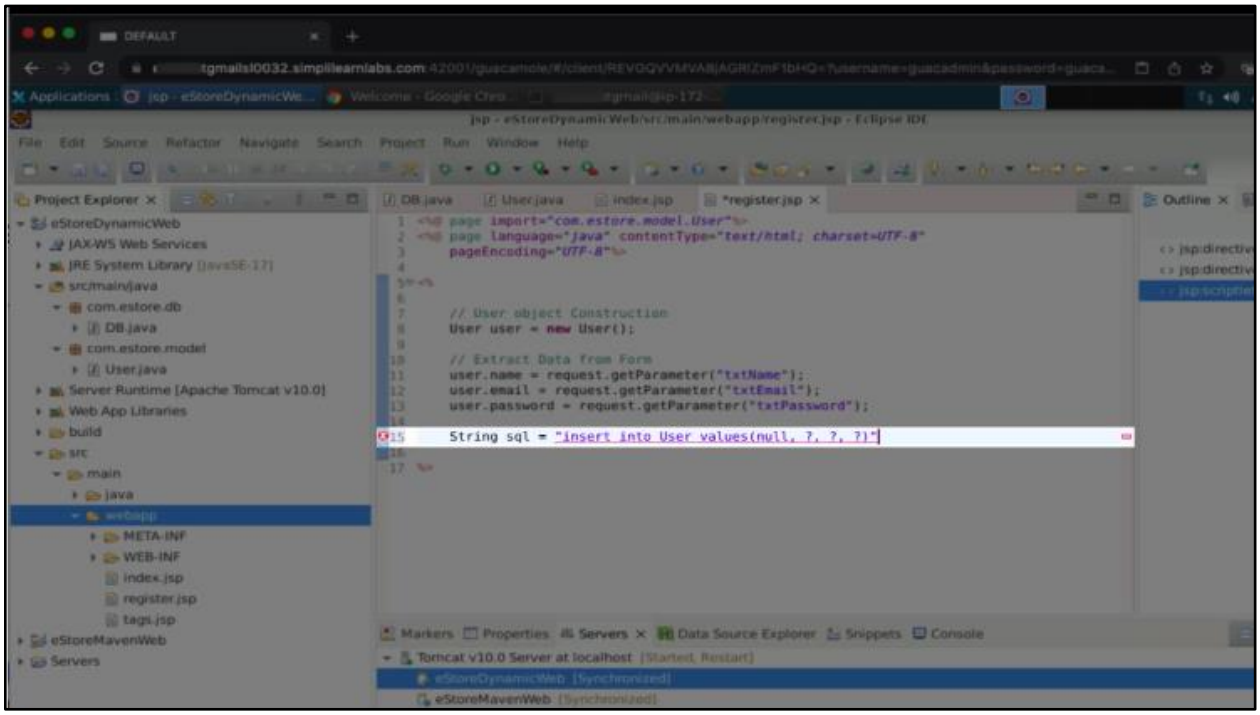
7.8 Add **request.getParameter()**



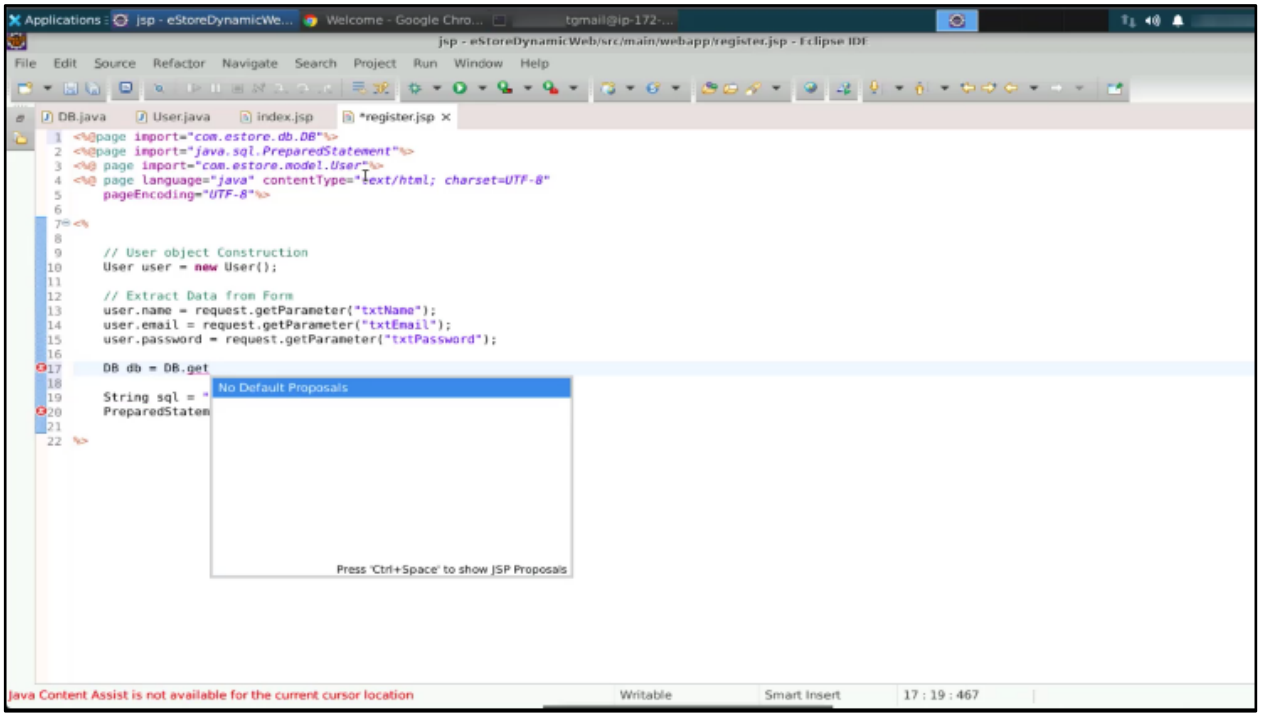
7.9 Add **request.getParameter()** object for all the attributes



7.10 Create an SQL statement



7.11 Type **DB.db = DB.get**

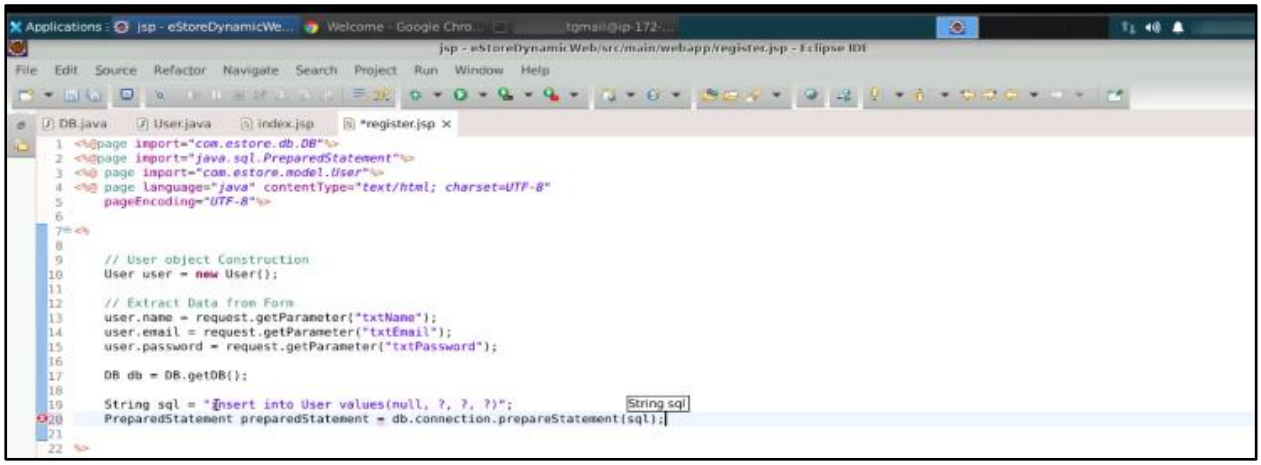


Step 8: Create an object for a prepared statement

8.1 Create an **object** for the prepared statement and add a connection to it as follows:

PreparedStatement preparedStatement = db.connection.preparedStatement

(sql);



8.2 Pass the following **preparedStatements:**

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

%>
```

8.3 Execute the **preparedStatement**

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);
    db.executeUpdate(preparedStatement);

%>
```

8.4 Write an **if-else** case

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

    int result = db.executeUpdate(preparedStatement);

    if(result > 1){
%>

    }else{

    }

%>
```

8.5 Add an **h3 tag** and an **expression tag**

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

    int result = db.executeUpdate(preparedStatement);

    if(result > 1){
%>
    <h3>Thank Your For Regsitration: <%= user.name %></h3>
    }else{

    }

%>
```

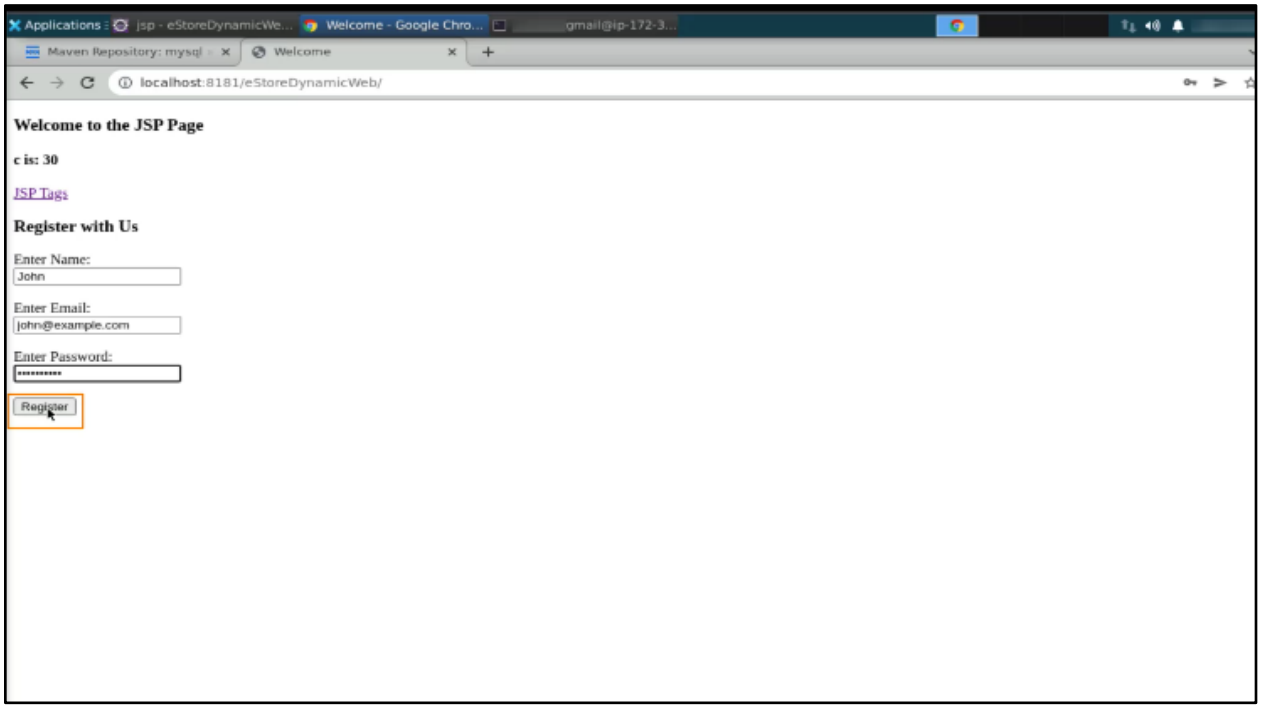
8.6 Start the **scriptlet** for the else statement

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

    int result = db.executeUpdate(preparedStatement);

    if(result > 1){
%>
    <h3>Thank Your For Registration: <%= user.name %></h3>
<%
    }else{
%>

<%
    }
%>
```

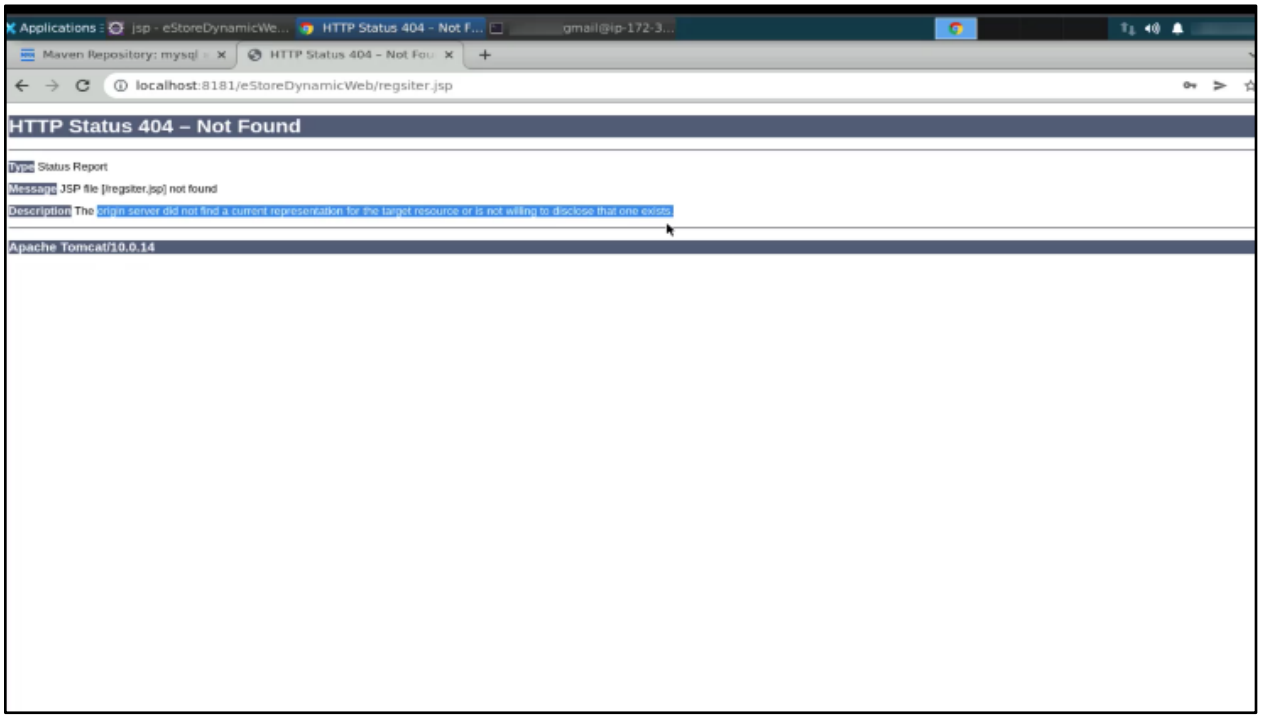
8.7 Add an **h3 tag**

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into User values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

    int result = db.executeUpdate(preparedStatement);

    if(result > 1){
%>
    <h3>Thank Your For Registration: <%= user.name %></h3>
<%
    }else{
%>
    <h3>Registration Failed <%= user.name %></h3>
<%
    }
%>
```

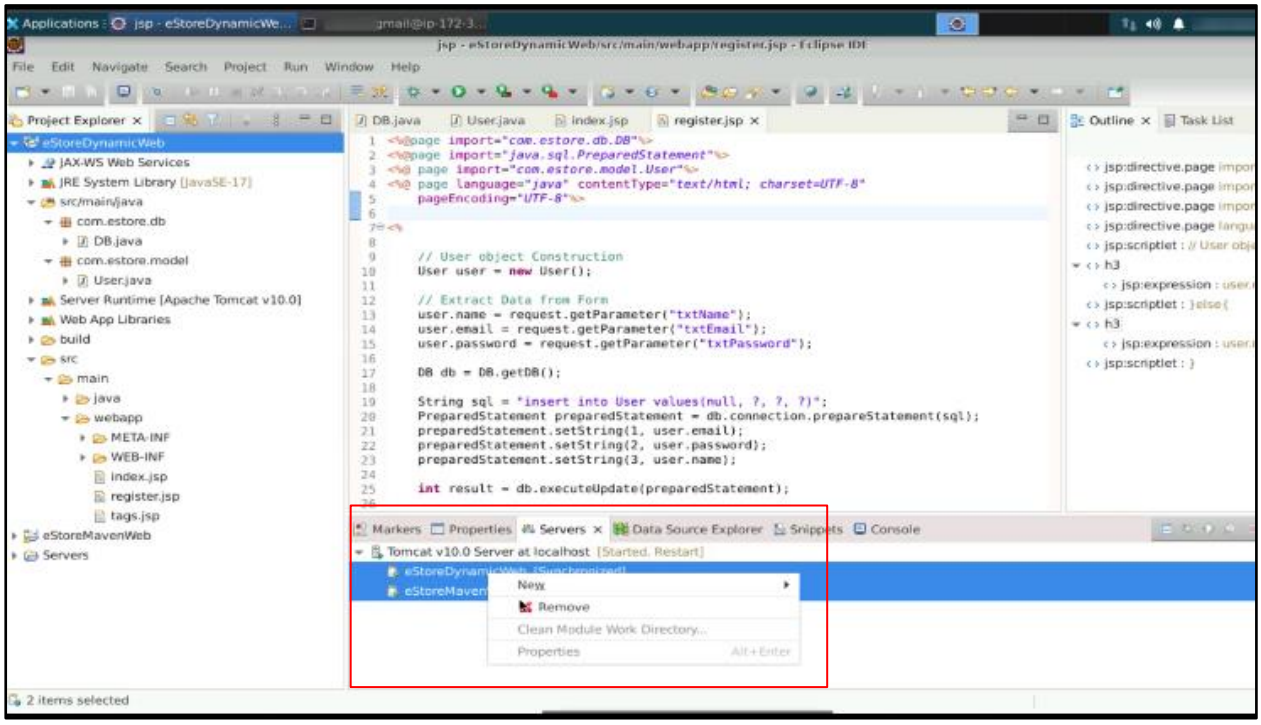
8.8 Enter the **name, email, and password** in the form, and click on **Register**



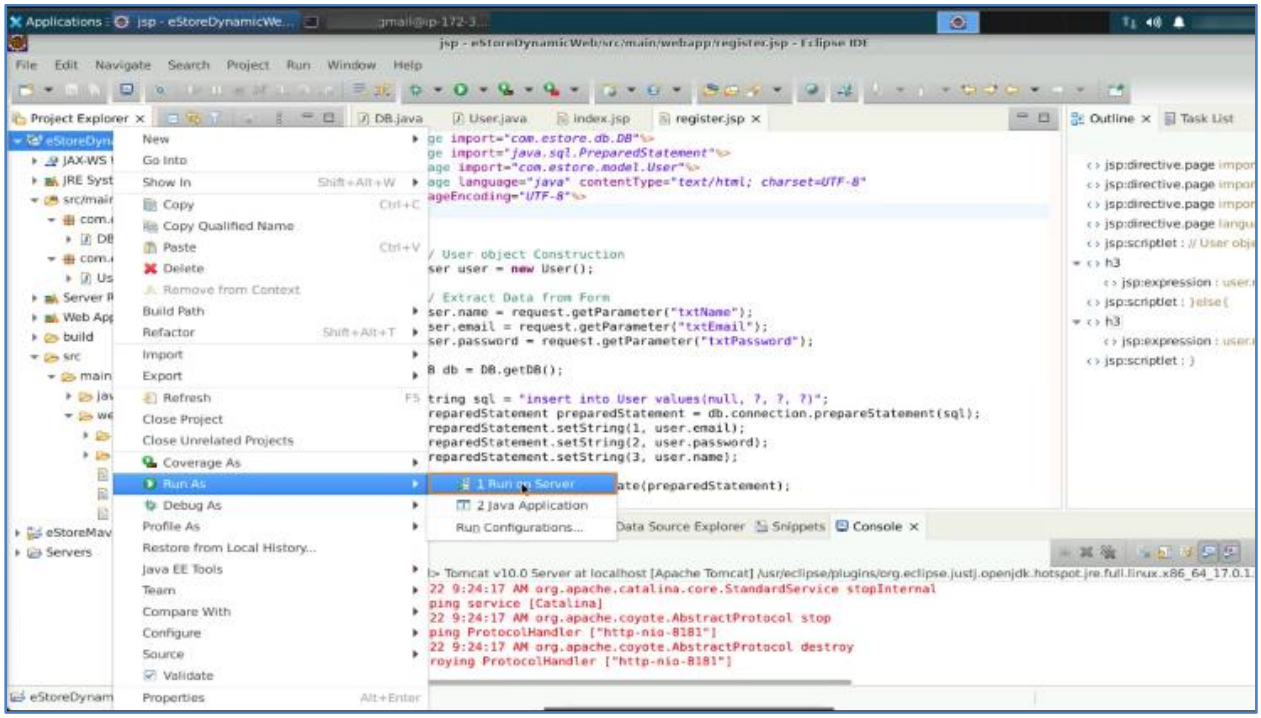
The result will be shown as:



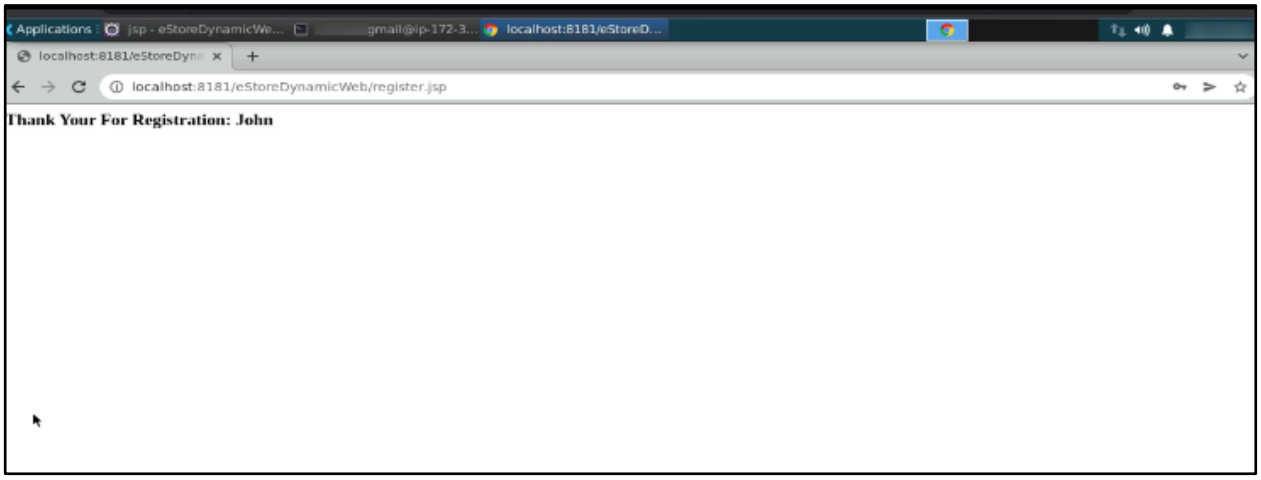
8.9 Remove this and stop the server once



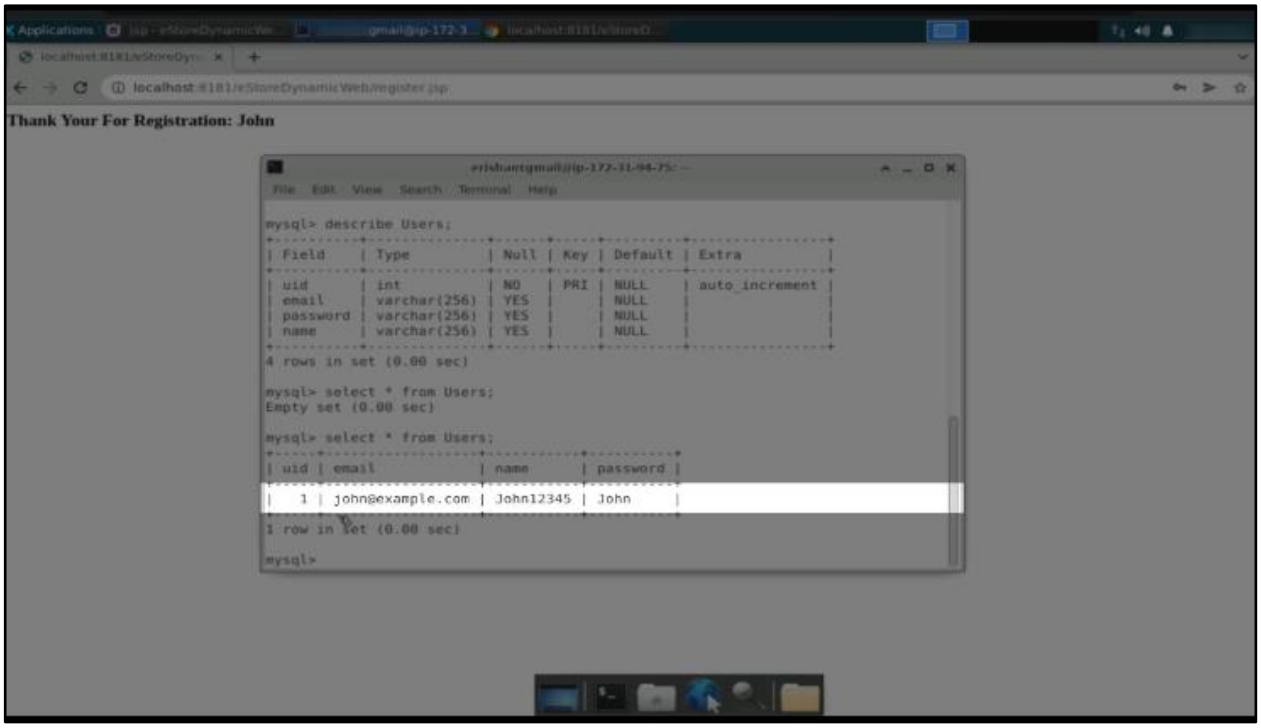
8.10 Click **Run on Server**



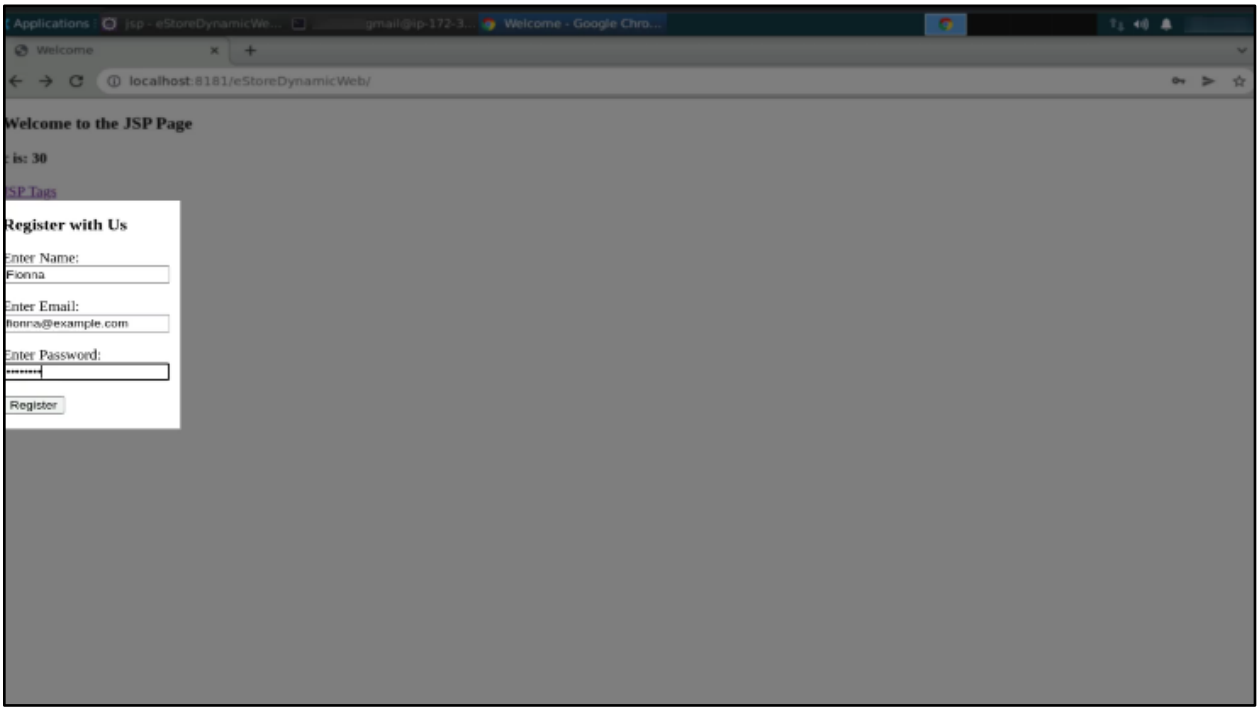
8.11 Enter the details in the form again and the result of the execution will be seen as:



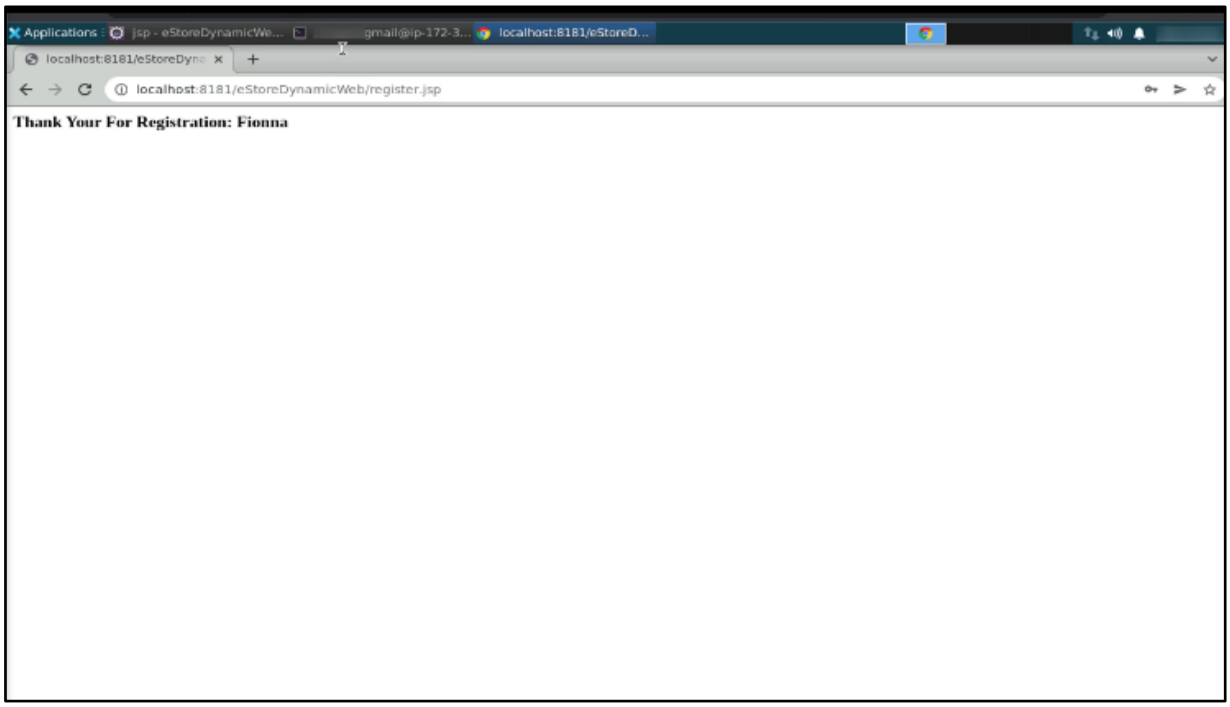
8.12 Write **select * from Users;** in the terminal



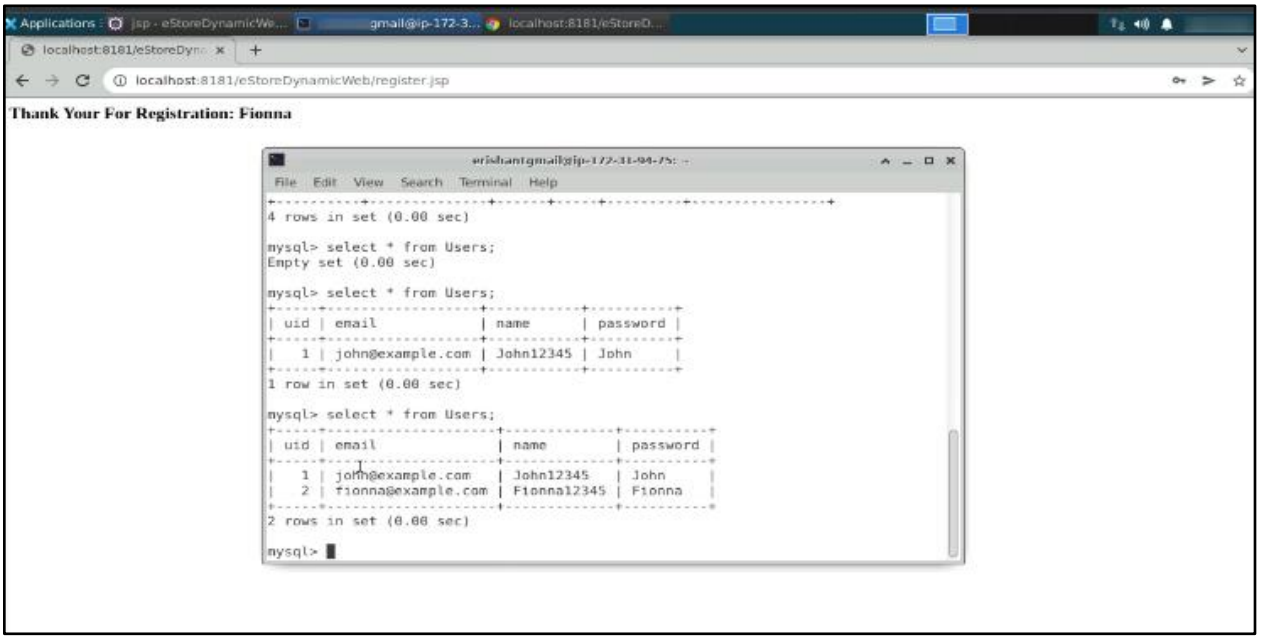
8.13 Enter another user detail in the form



The message will be shown on the screen as:

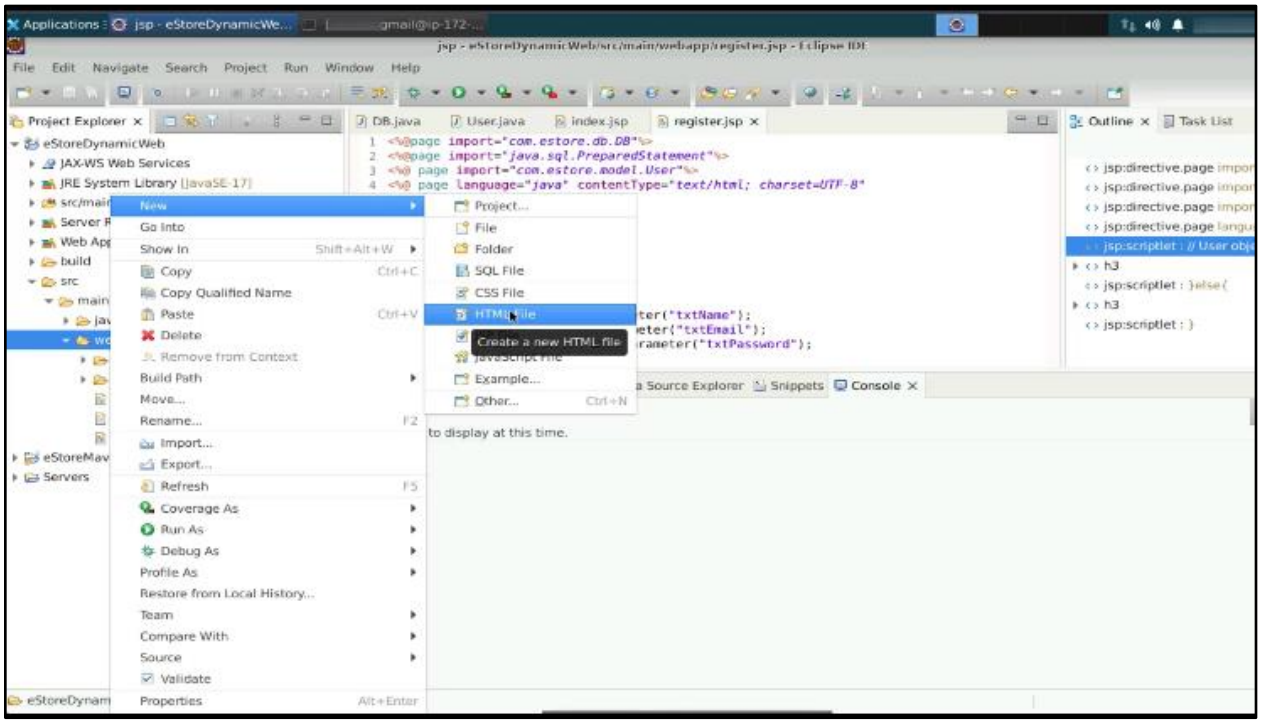


8.14 Again, pass the command **select * from Users;**

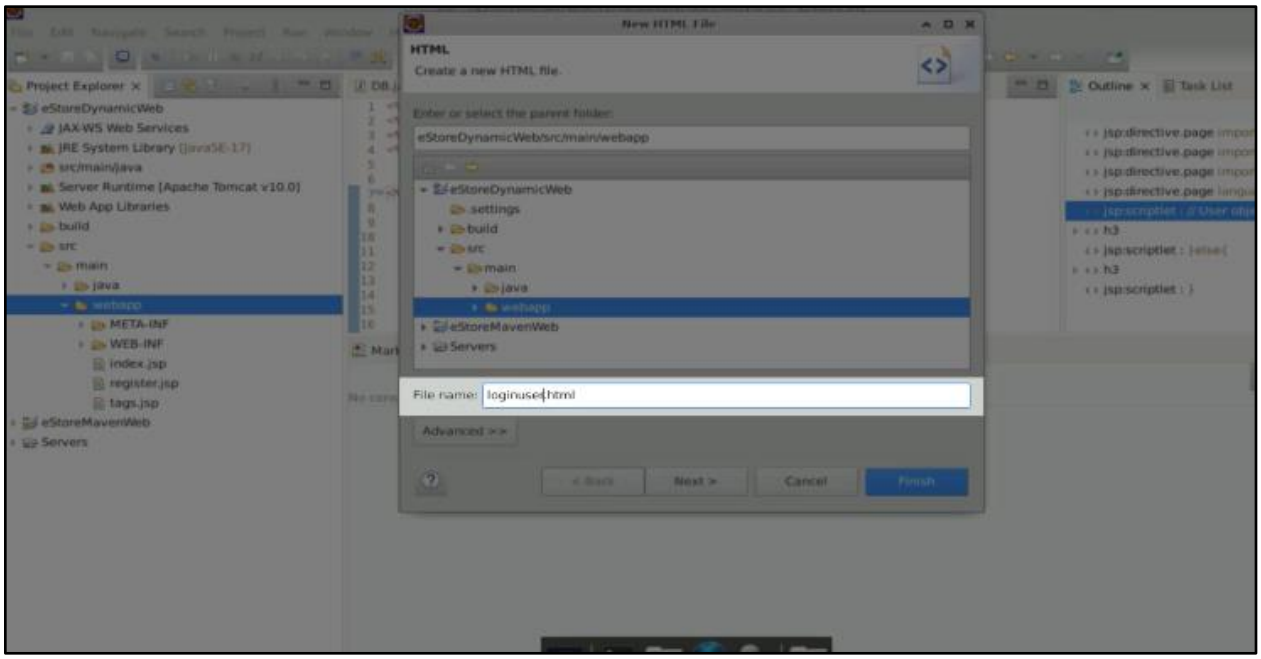


Step 9: Create an HTML file in the web app directory

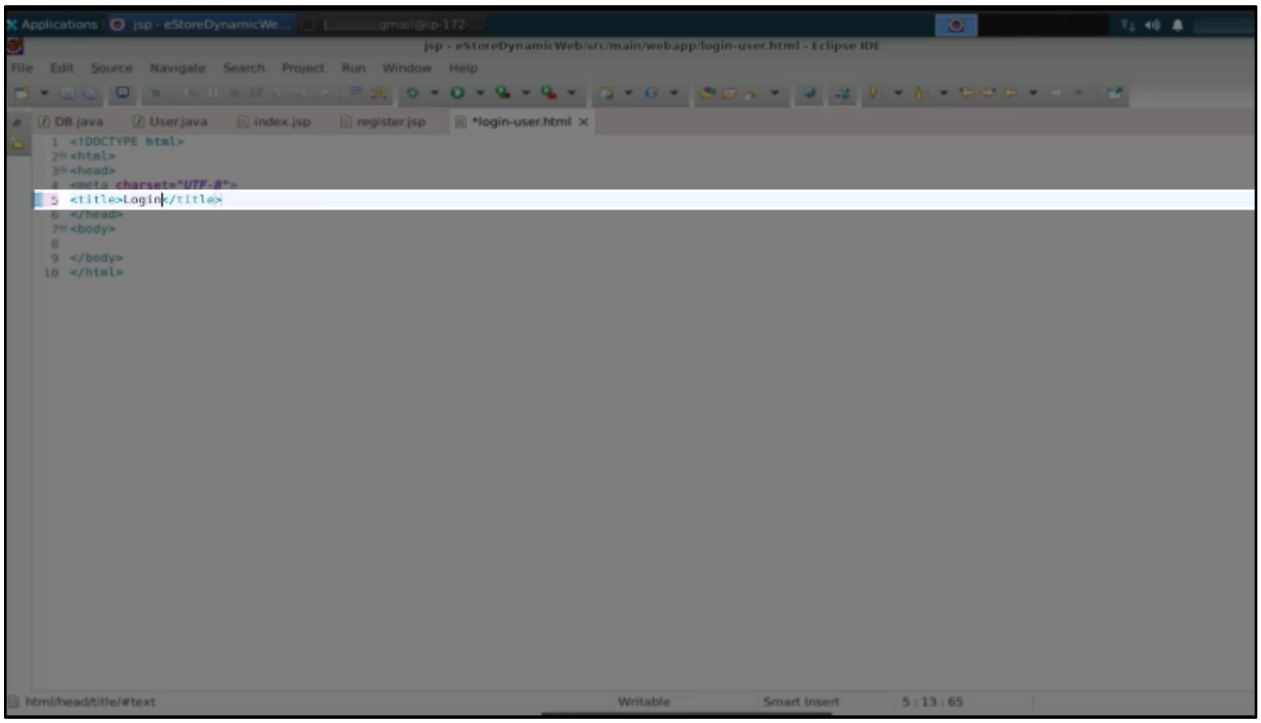
9.1 Create one HTML file in the web app directory. Right-click on the **webapp**, select **New**, and select **HTML file**



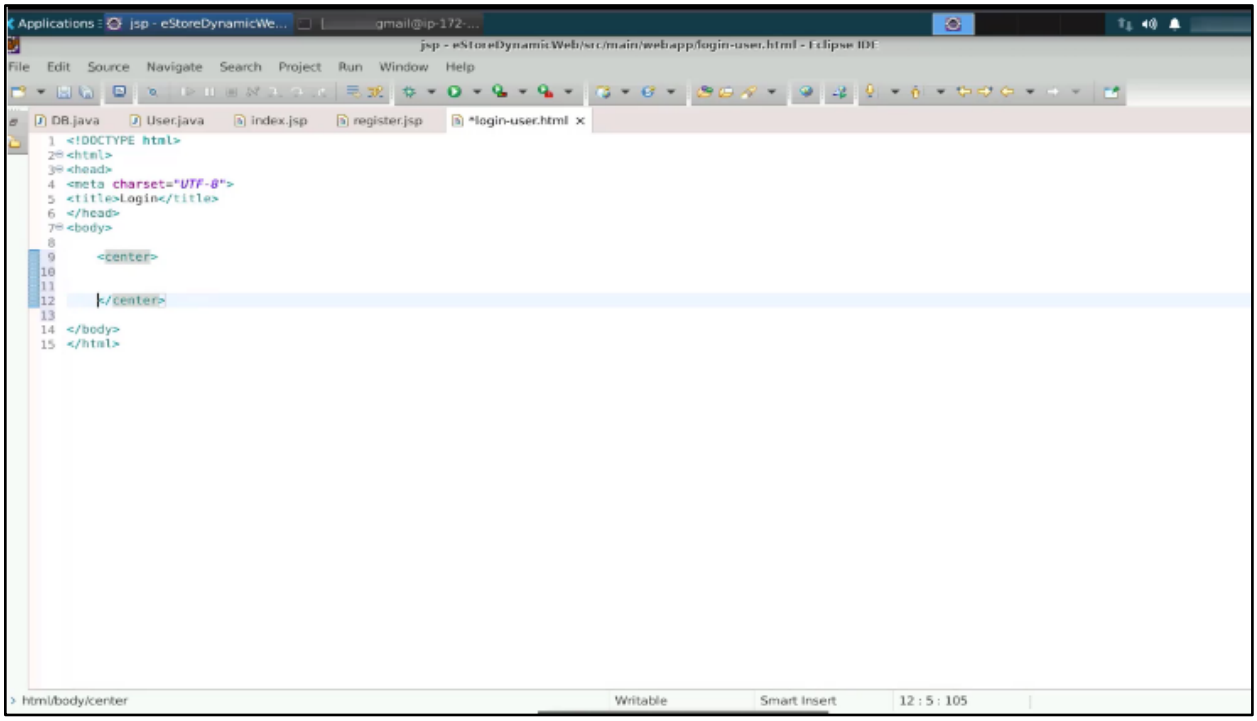
9.2 Name the file **loginuser.html**



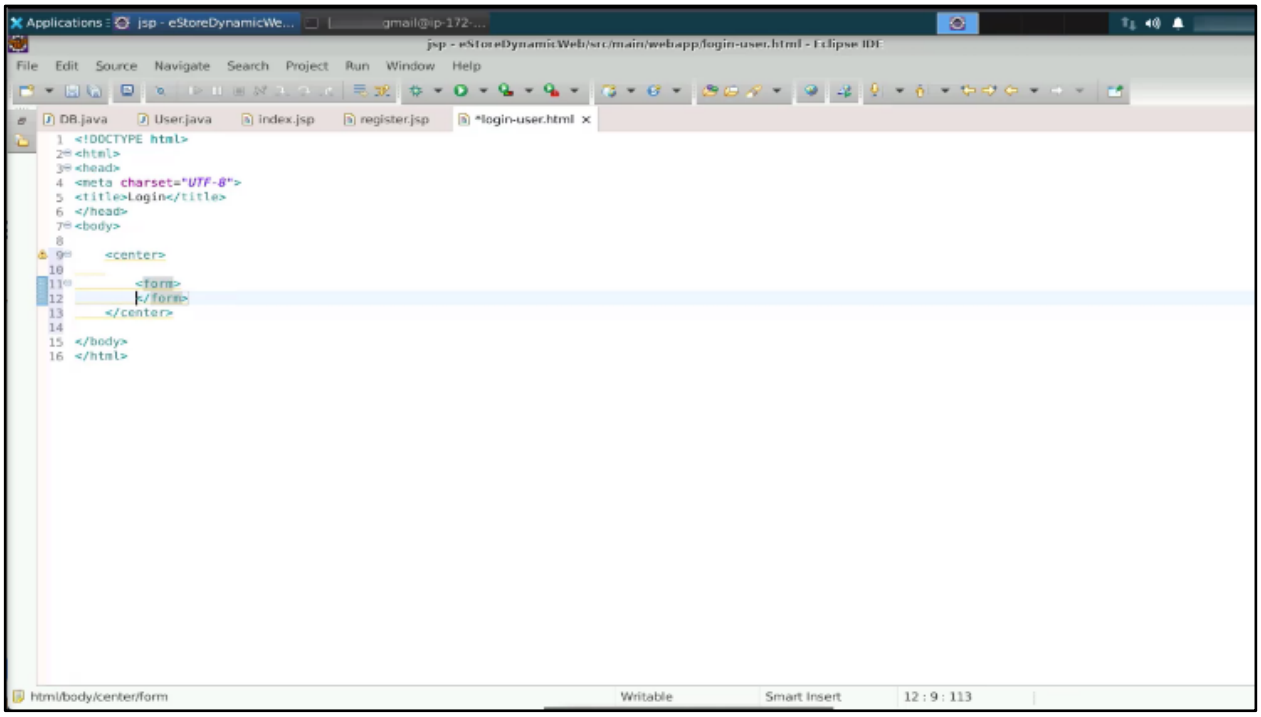
9.3 Add a **title** for the login page



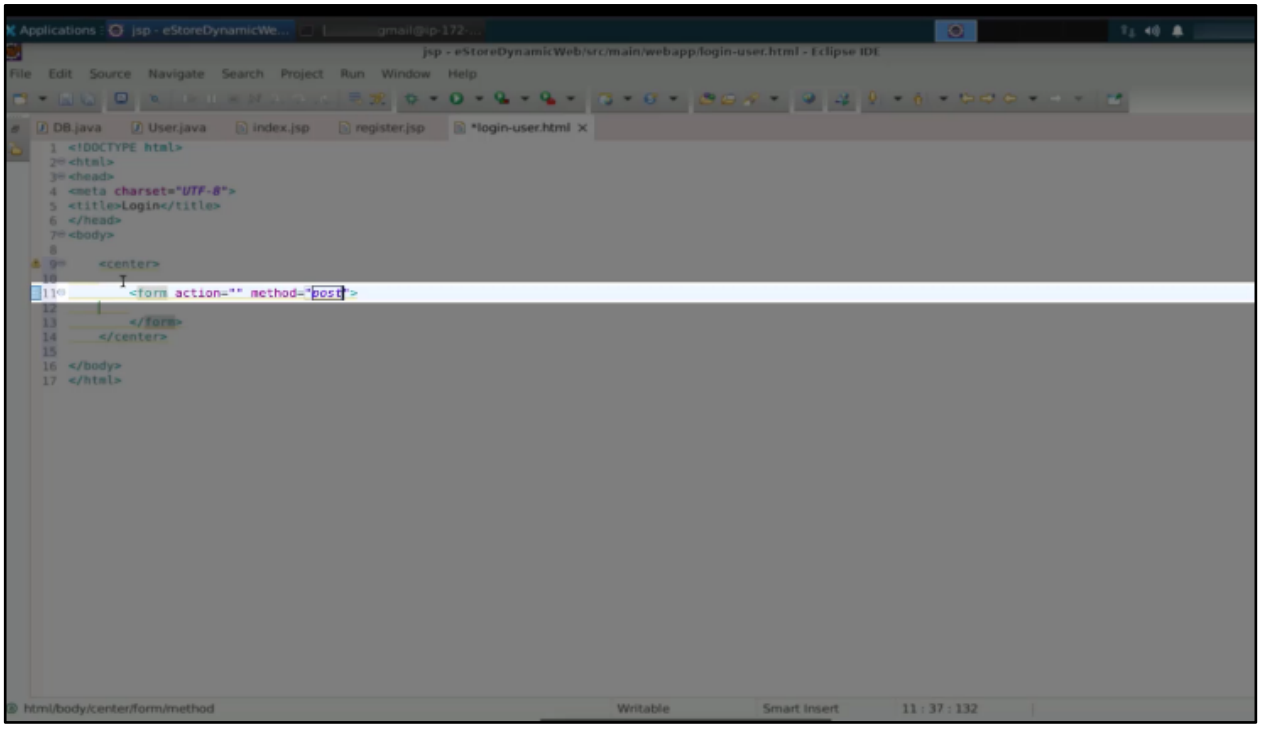
9.4 Create a **center tag** in the body tag



9.5 Add a **form tag**

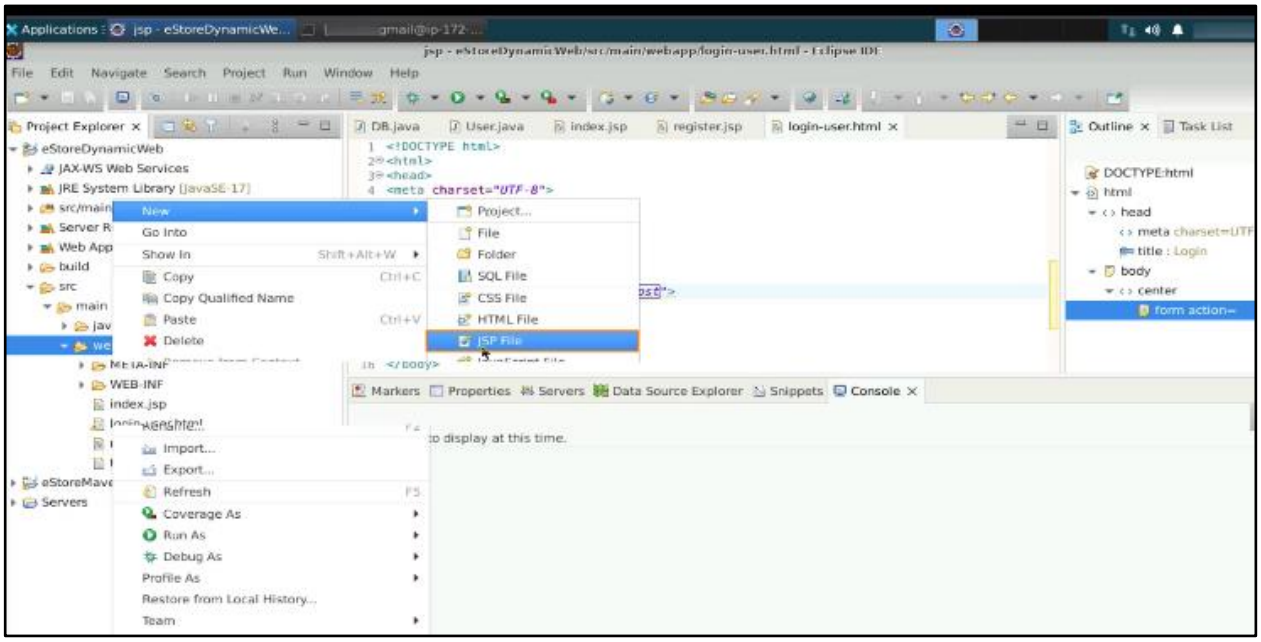


9.6 Add the **action and method** for the form tag

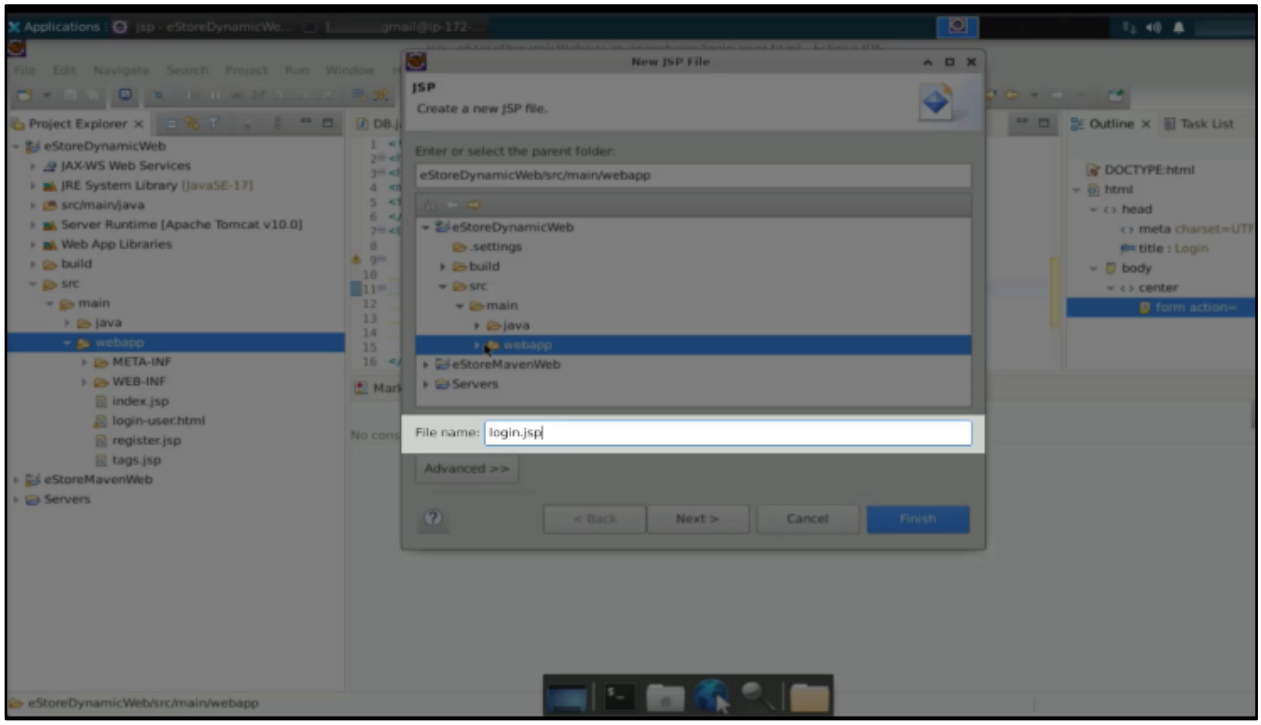


Step 10: Create another JSP file

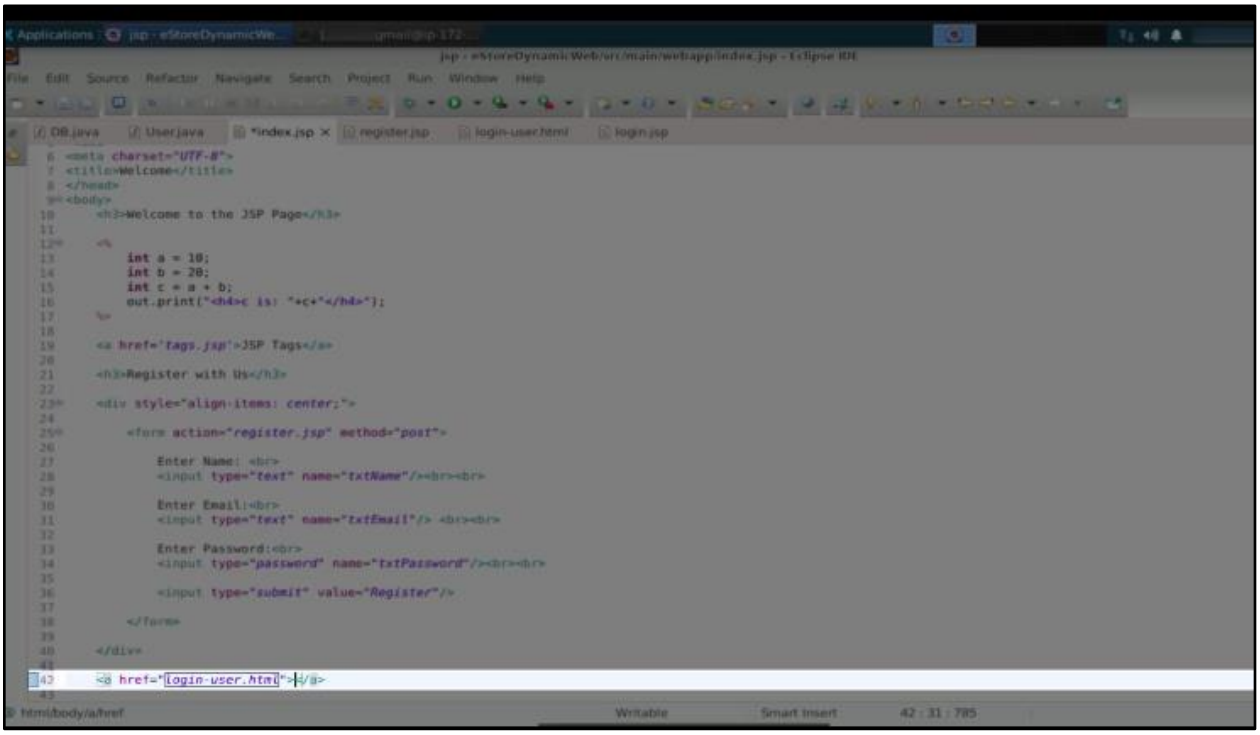
10.1 Create another JSP file by right-clicking on **webapp> New > JSP File**



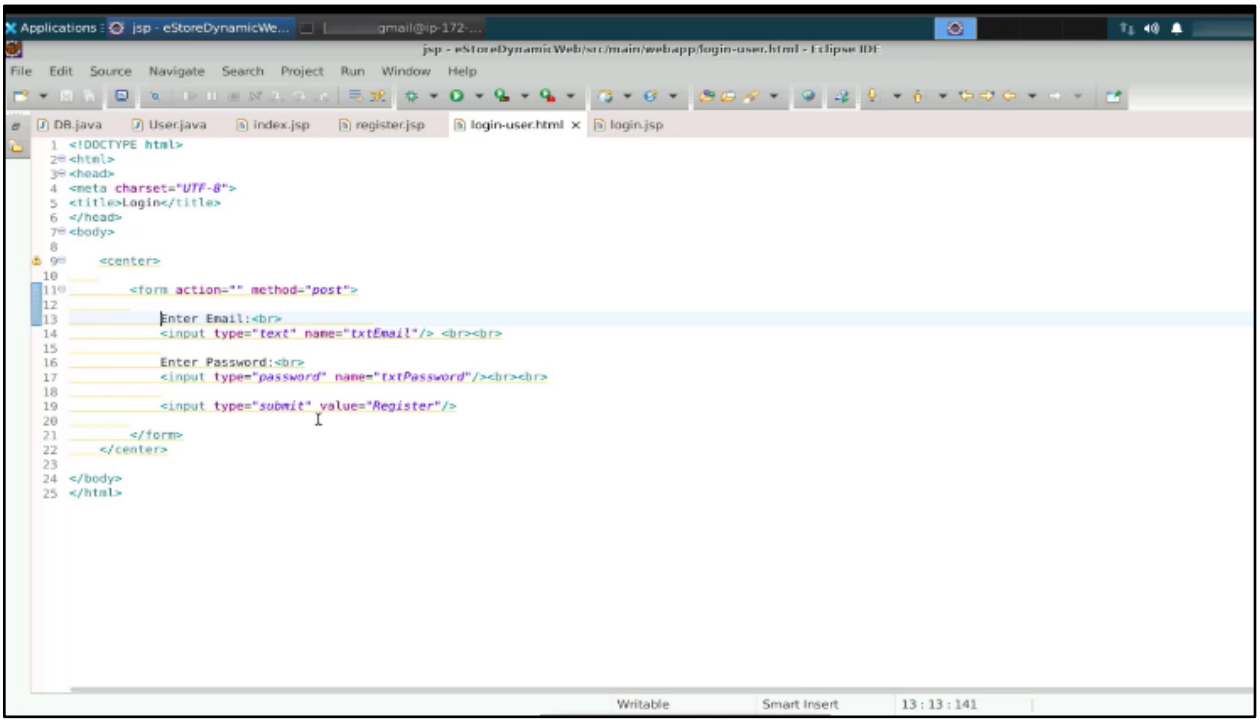
10.2 Add the file name **login.jsp**



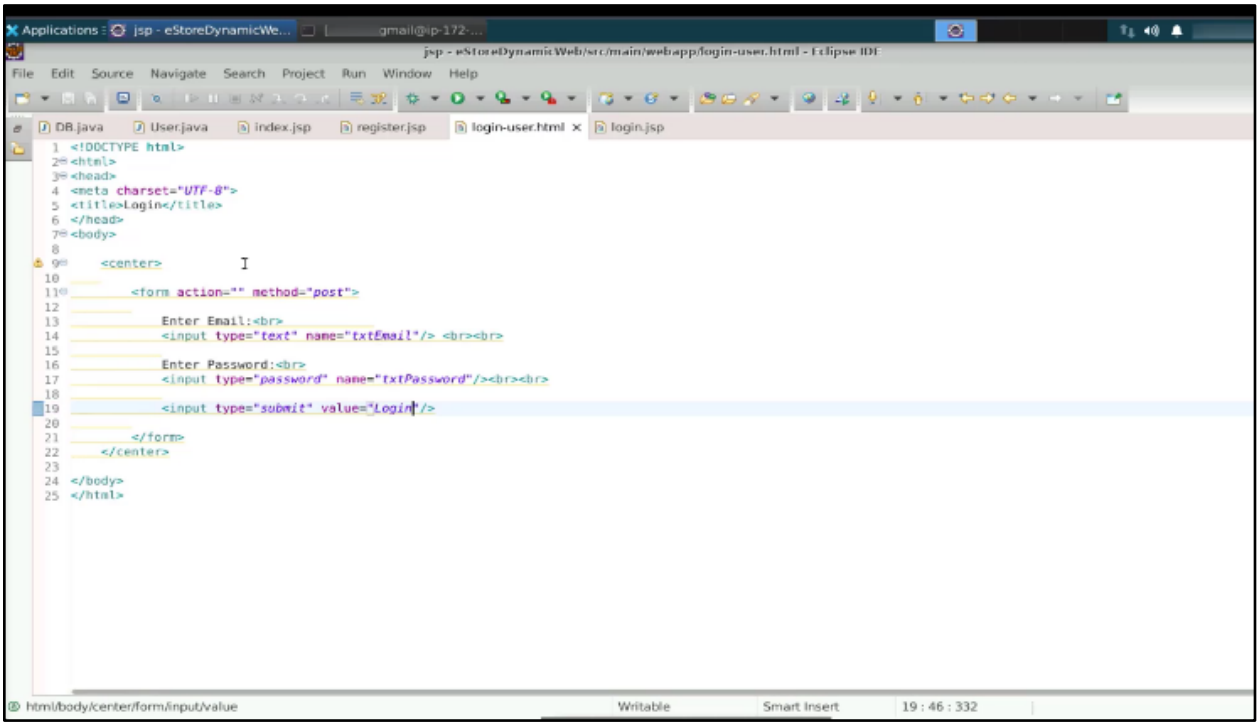
10.3 Write an **anchor tag** with a hyperlink to connect the pages



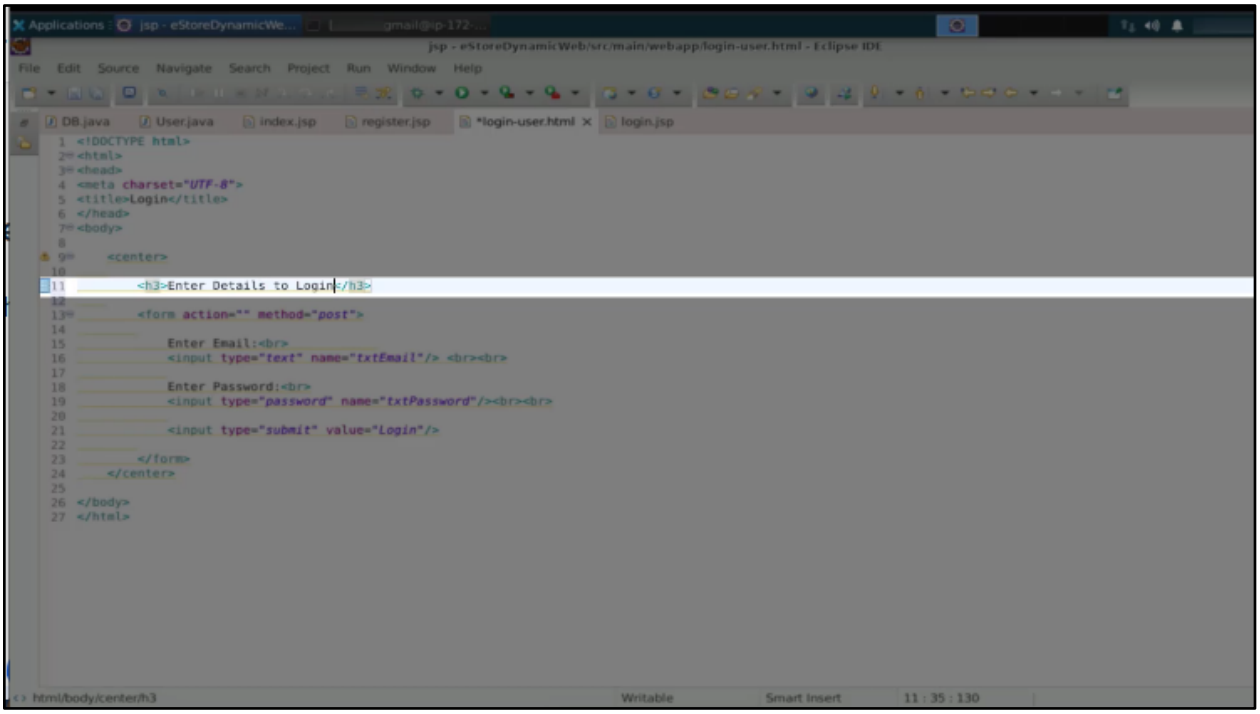
10.4 Add the **email** and **password** fields for the login form



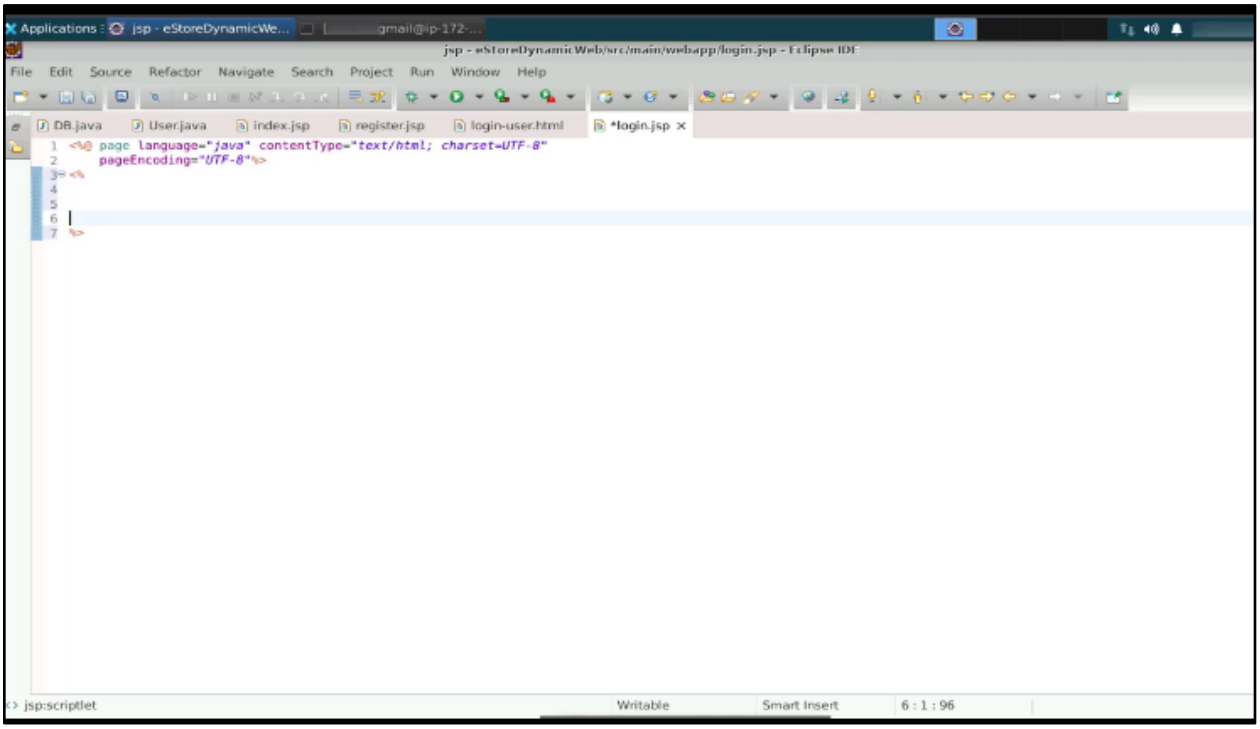
10.5 Add a **Login button**



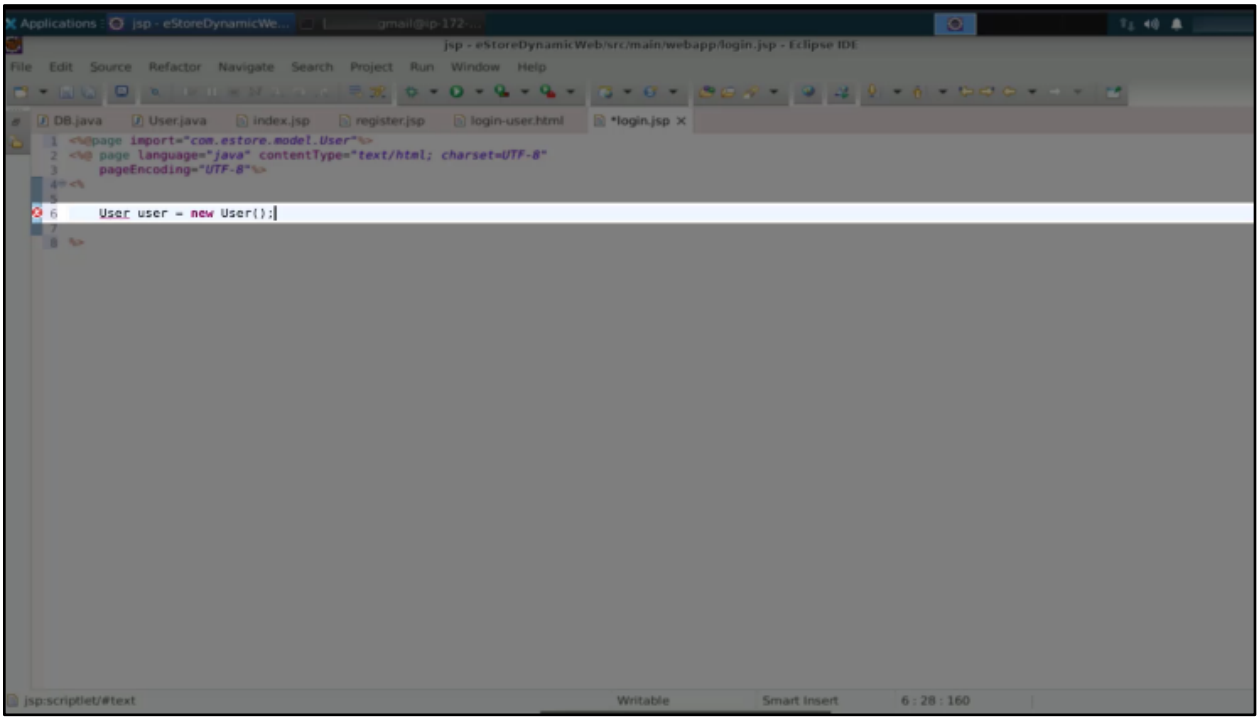
10.6 Add an **h3 tag**



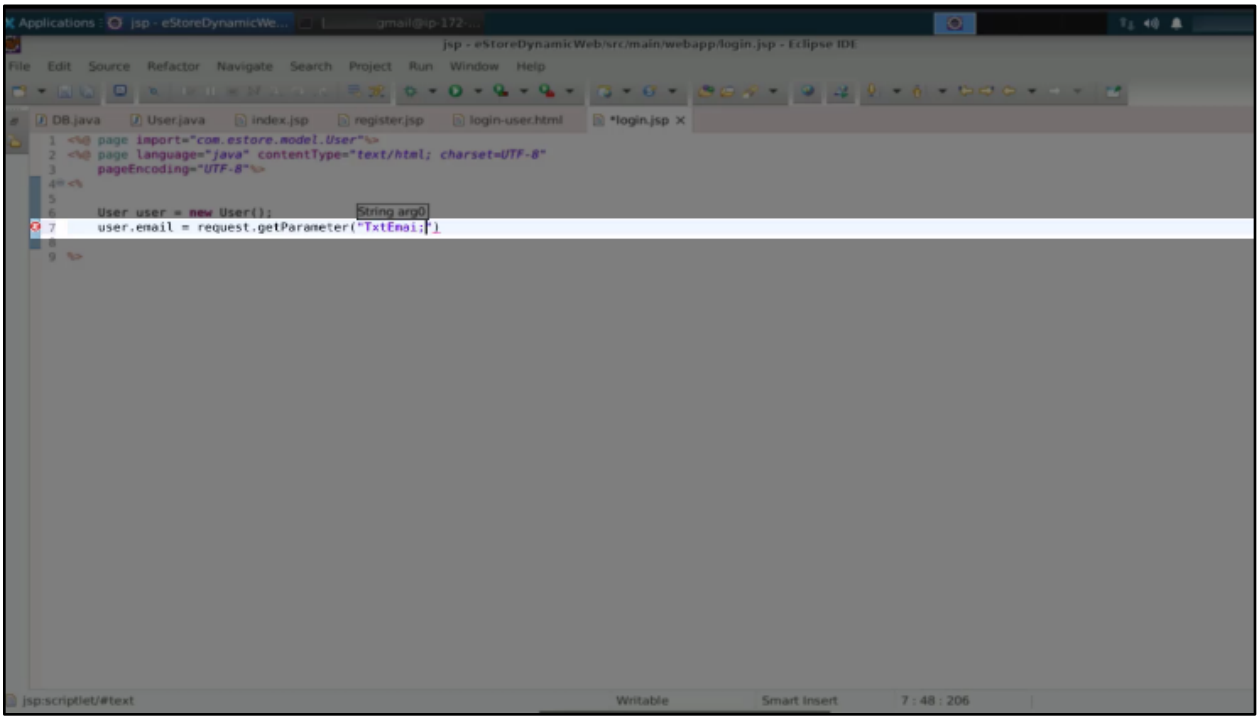
10.7 Create a **scriptlet tag**



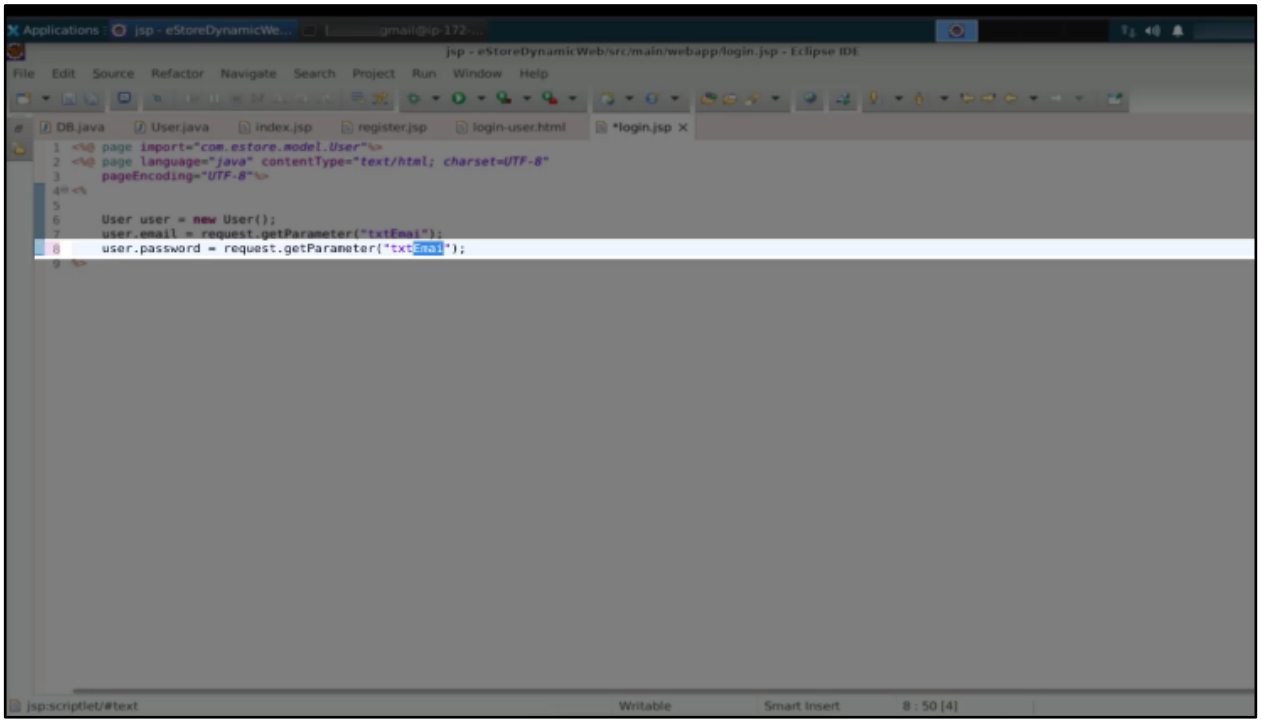
10.8 Create a **User object**



10.8 Add the **request.getParameter()** statement

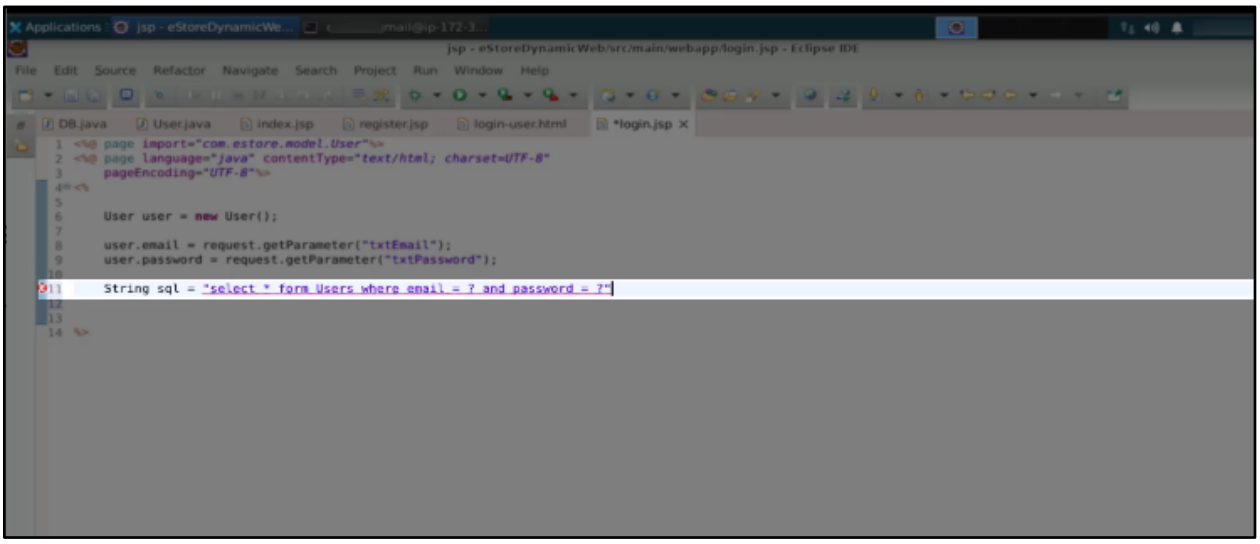


10.9 Add the **request.getParameter()** object for the password

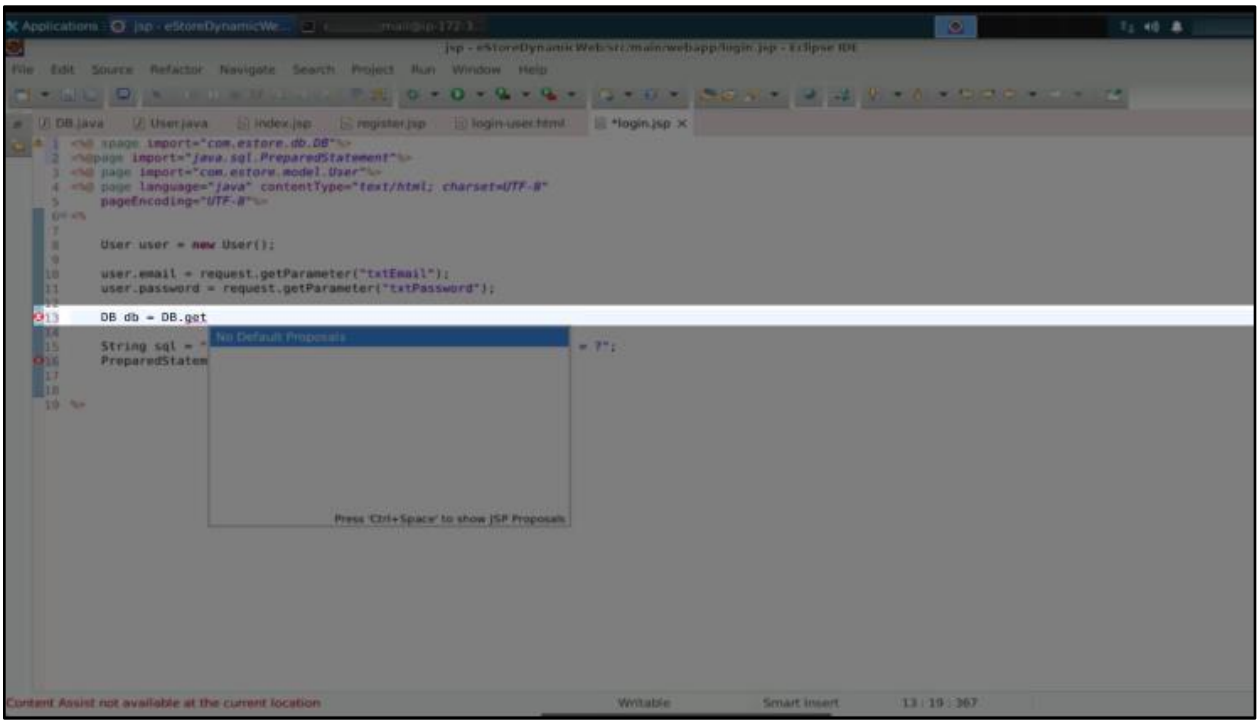


Step 11: Add an SQL statement

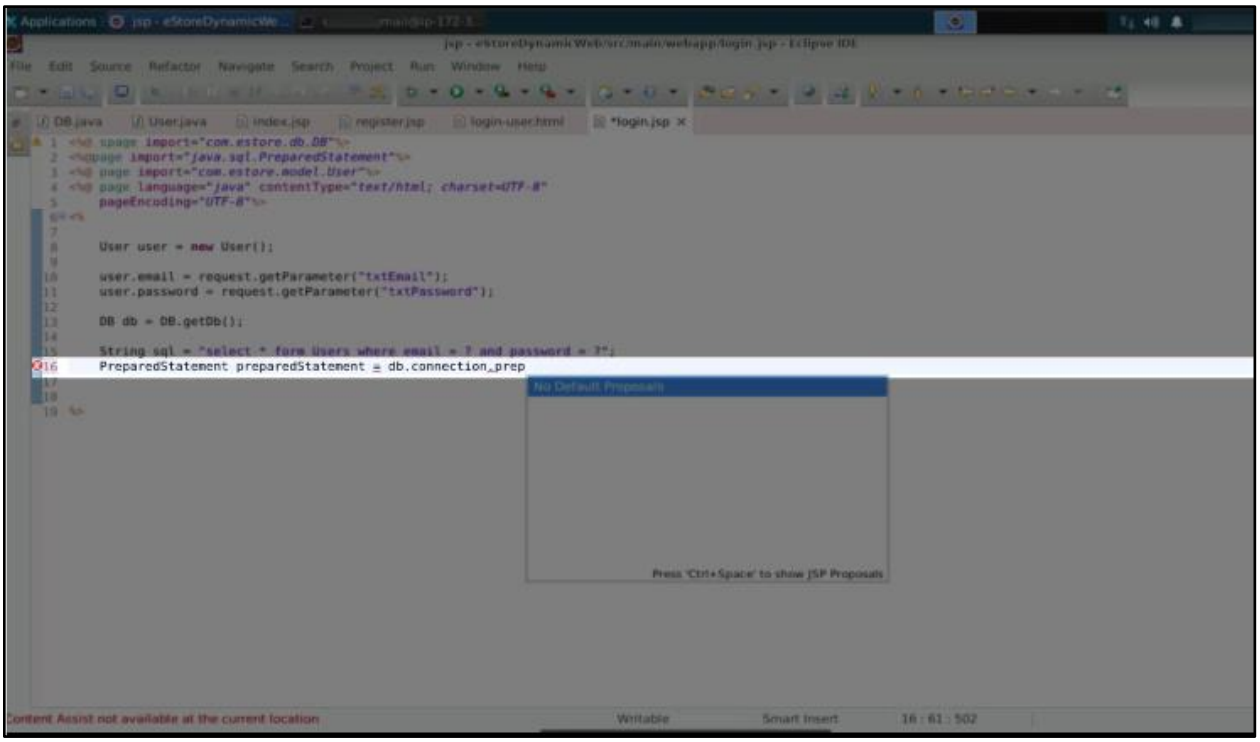
11.1 Add an SQL statement to add user and password



11.2 Get the object of **DB.get**



11.3 Access the **connection** with the database



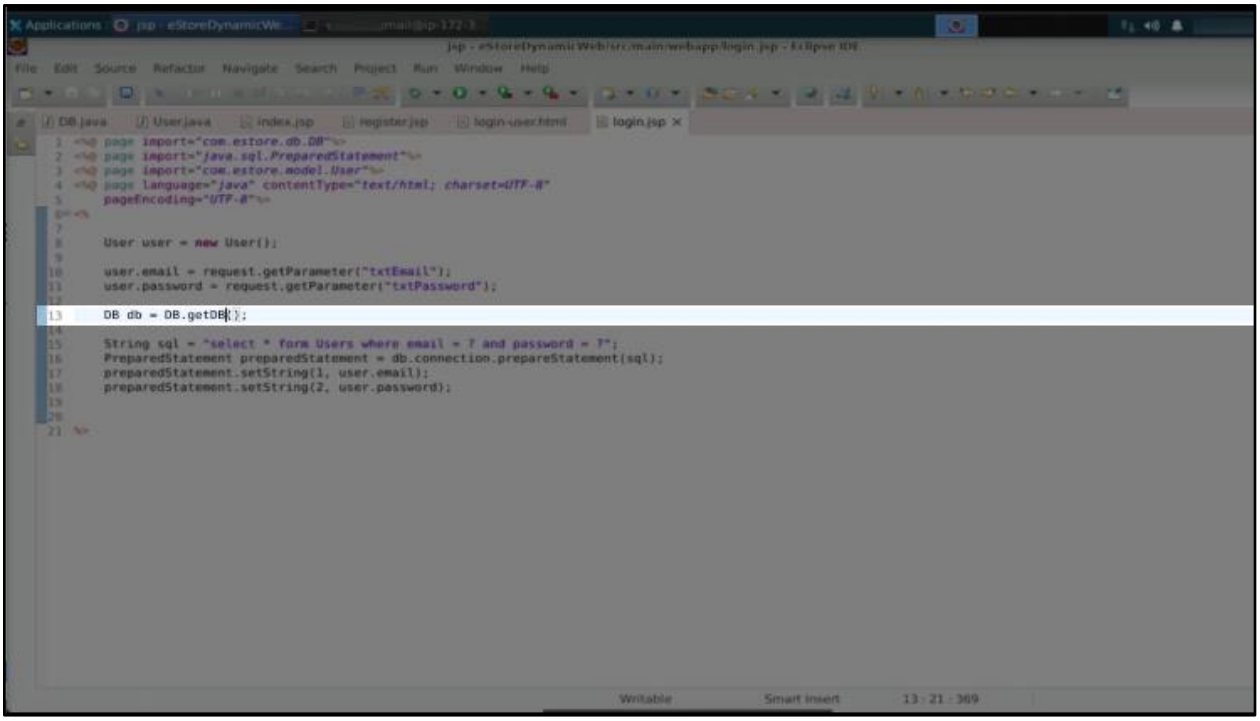
11.4 Copy the entire part of the code shown below:

```
<%@page import="com.estore.db.DB"%>
<%@page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>

<%

    // User object Construction
    User user = new User();

    // Extract Data from Form
    user.name = request.getParameter("txtName");
    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "insert into Users values(null, ?, ?, ?)";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);

    int result = db.executeUpdate(preparedStatement);

    if(result >= 1){
%>
    <h3>Thank Your For Registration: <%= user.name %></h3>
<%
    }else{
%>
    <h3>Registration Failed: <%= user.name %></h3>
<%
    }

%>
```

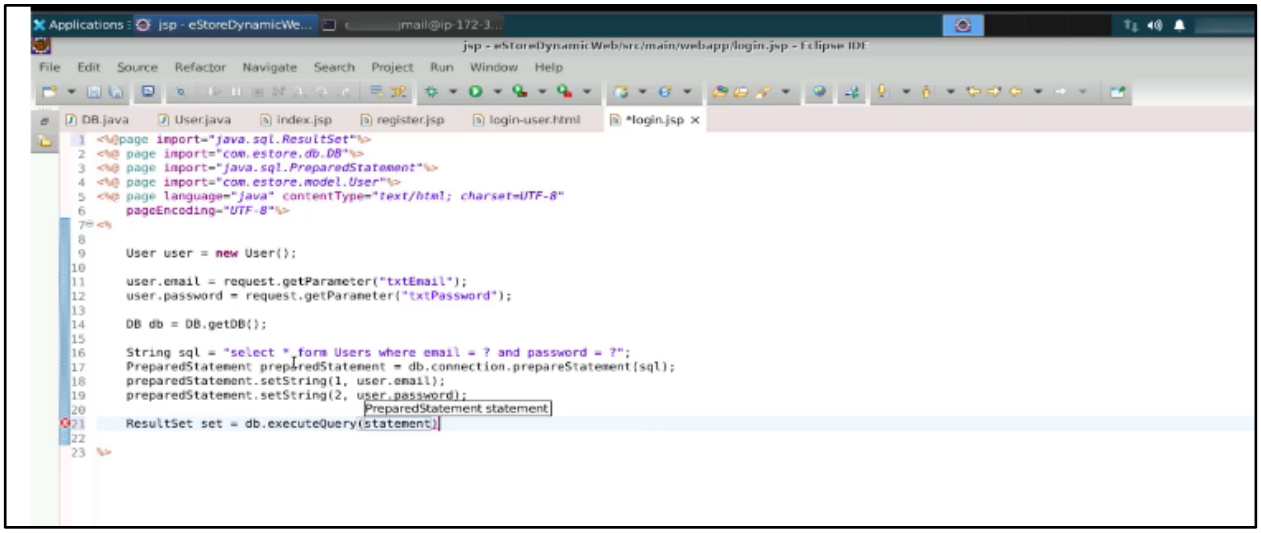
11.5 **Paste** the statement into the login.jsp page

```
<%@ page import="com.estore.db.DB"%>
<%@ page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%

    User user = new User();

    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDb();

    String sql = "select * form Users where email = ? and password = ?";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);
    preparedStatement.setString(3, user.name);


%>
```

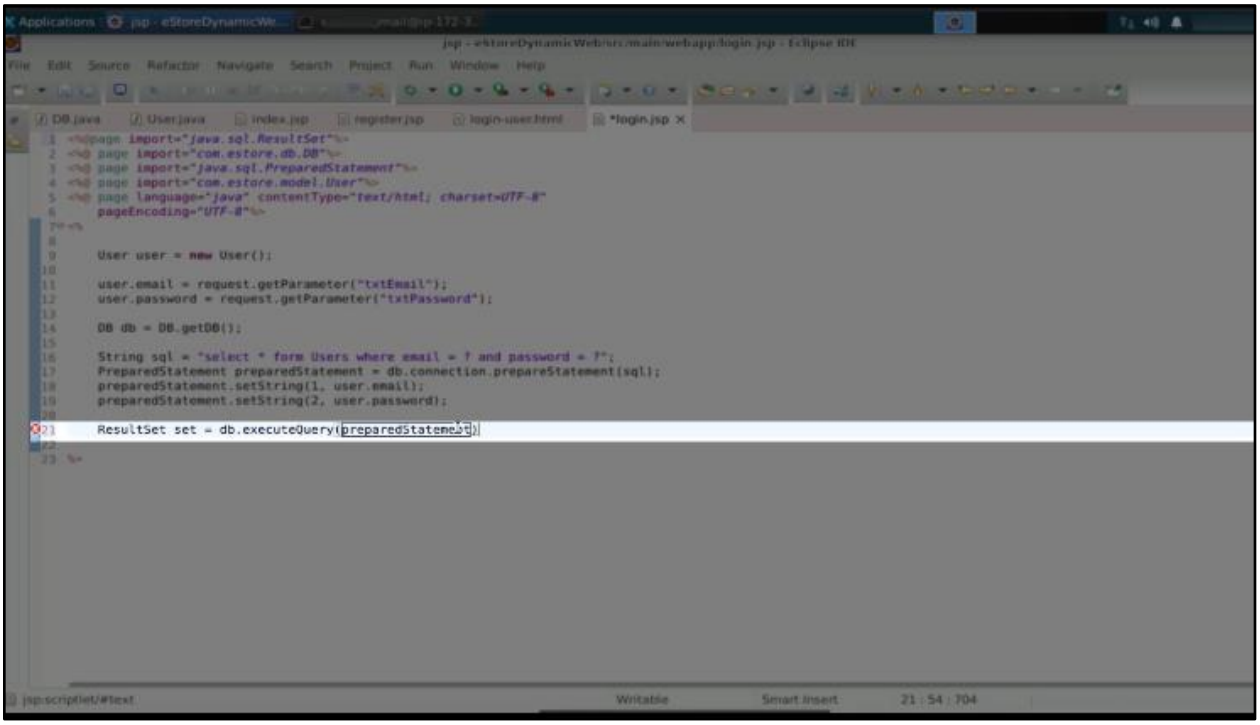
11.6 Change this to **DB:**



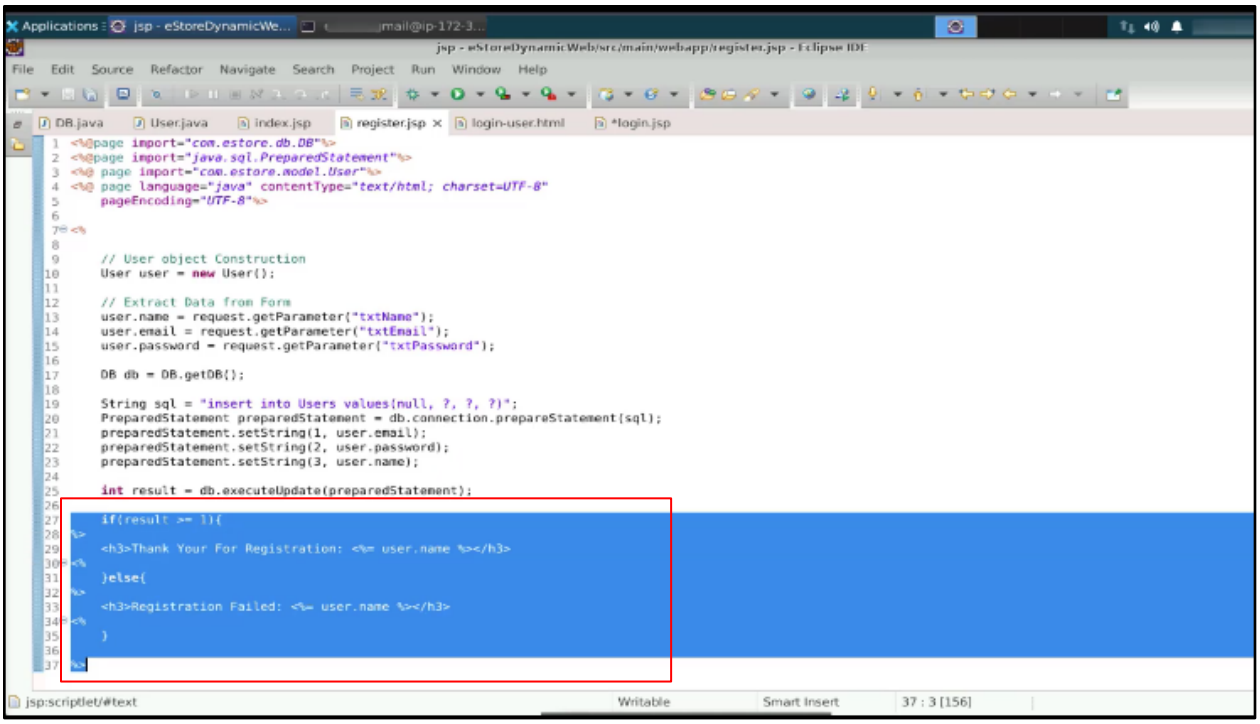
11.7 Add the **ResultSet**



11.8 Insert the **preparedStatement** as the parameter



11.9 Copy the code as highlighted below:



11.9 Paste it here in the **login.jsp** file:

```
<%@page import="java.sql.ResultSet"%>
<%@ page import="com.estore.db.DB"%>
<%@ page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%

    User user = new User();

    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "select * form Users where email = ? and password = ?";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);

    ResultSet set = db.executeQuery(preparedStatement);

    if(result >= 1){
%>
<h3>Thank Your For Registration: <%= user.name %></h3>
<%
    }else{
%>
<h3>Registration Failed: <%= user.name %></h3>
<%
    }

%>
```

Step 12: Set the if case

12.1 Add the **if case**

```
<%@page import="java.sql.ResultSet"%>
<%@ page import="com.estore.db.DB"%>
<%@ page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%

    User user = new User();

    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "select * form Users where email = ? and password = ?";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);

    ResultSet set = db.executeQuery(preparedStatement);

    if(set != null && set.next){
%>
<h3>Thank Your For Reg
<%
    }else{
%>
<h3>Registration Faile
<%
    }

%>
```

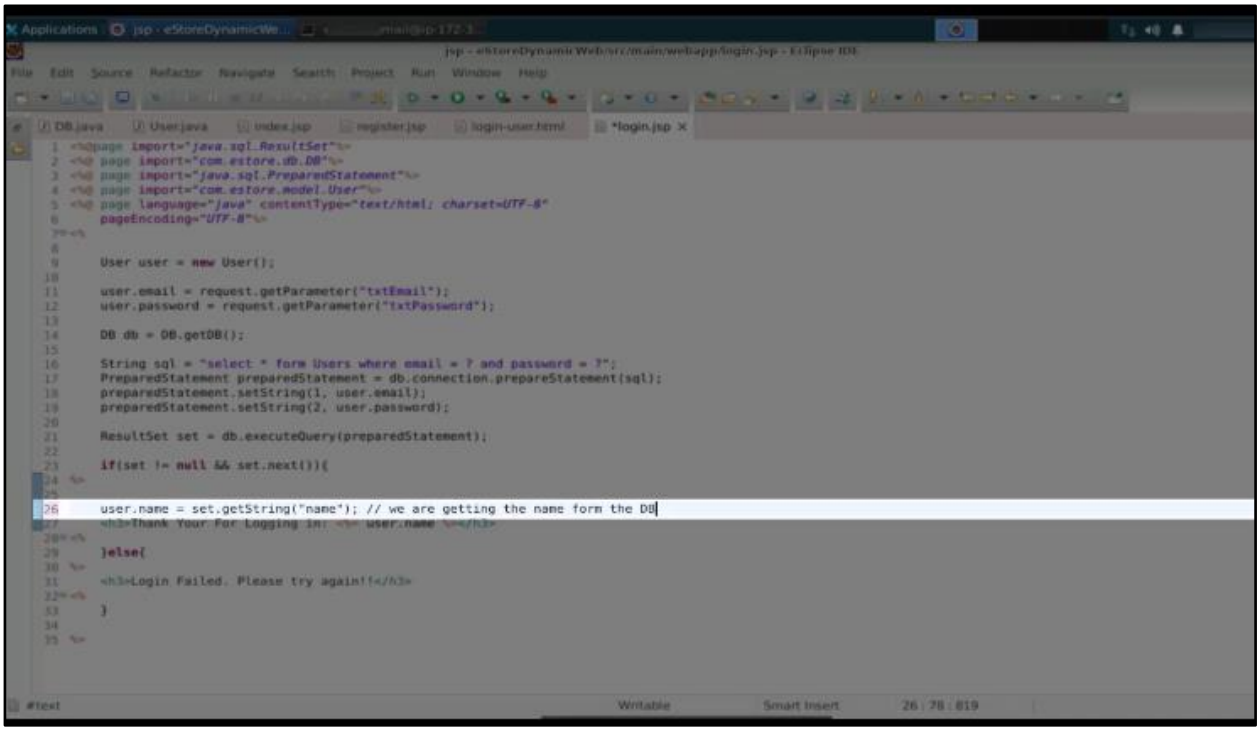
12.2 Set the **else case**

```
<%@page import="java.sql.ResultSet"%>
<%@ page import="com.estore.db.DB"%>
<%@ page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%

    User user = new User();

    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "select * form Users where email = ? and password = ?";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);

    ResultSet set = db.executeQuery(preparedStatement);

    if(set != null && set.next()){
%>
    <h3>Thank Your For Registration: <%= user.name %></h3>
<%
    }else{
%>
    <h3>Login Failed. Please try again!</h3>
<%
    }
%>
```

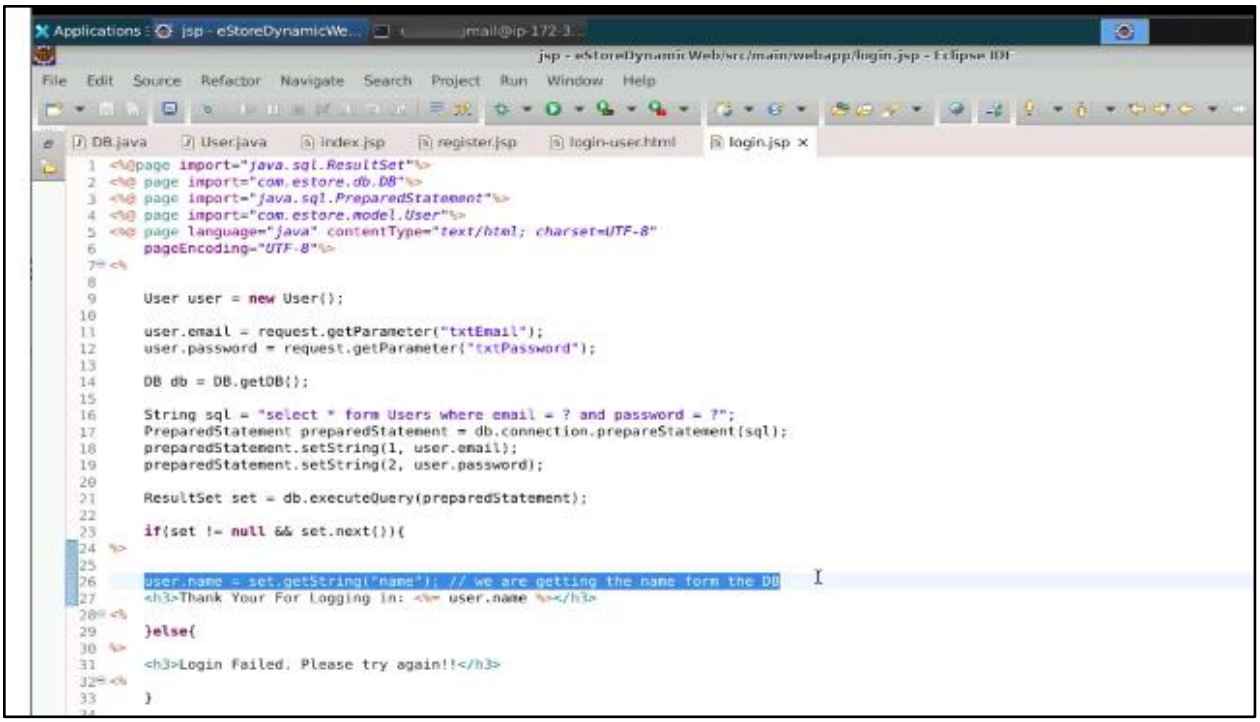
12.3 Edit the **h3 tag** for the login page

```
<%@page import="java.sql.ResultSet"%>
<%@ page import="com.estore.db.DB"%>
<%@ page import="java.sql.PreparedStatement"%>
<%@ page import="com.estore.model.User"%>
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<%

    User user = new User();

    user.email = request.getParameter("txtEmail");
    user.password = request.getParameter("txtPassword");

    DB db = DB.getDB();

    String sql = "select * form Users where email = ? and password = ?";
    PreparedStatement preparedStatement = db.connection.prepareStatement(sql);
    preparedStatement.setString(1, user.email);
    preparedStatement.setString(2, user.password);

    ResultSet set = db.executeQuery(preparedStatement);

    if(set != null && set.next()){
%>
    <h3>Thank Your For Loggn: <%= user.name %></h3>
<%
    }else{
%>
    <h3>Login Failed. Please try again!!</h3>
<%
    }
%>
```

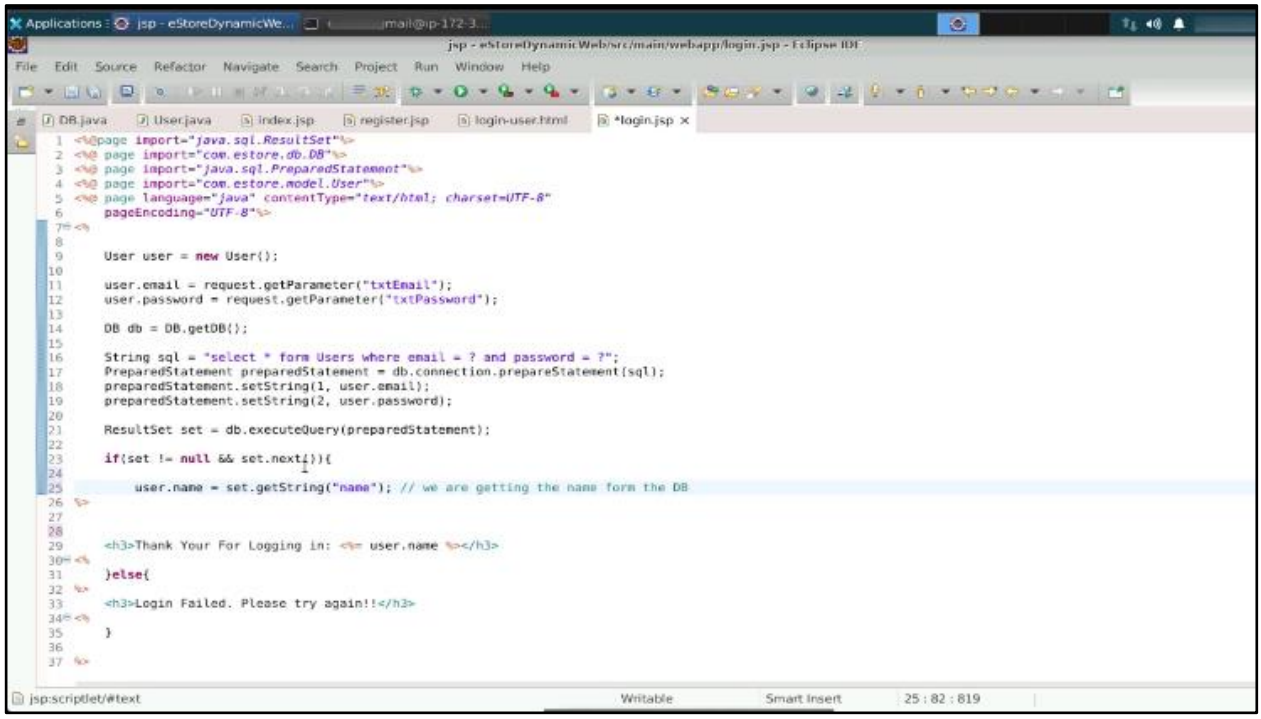
12.4 Get the username using the **getString()** statement



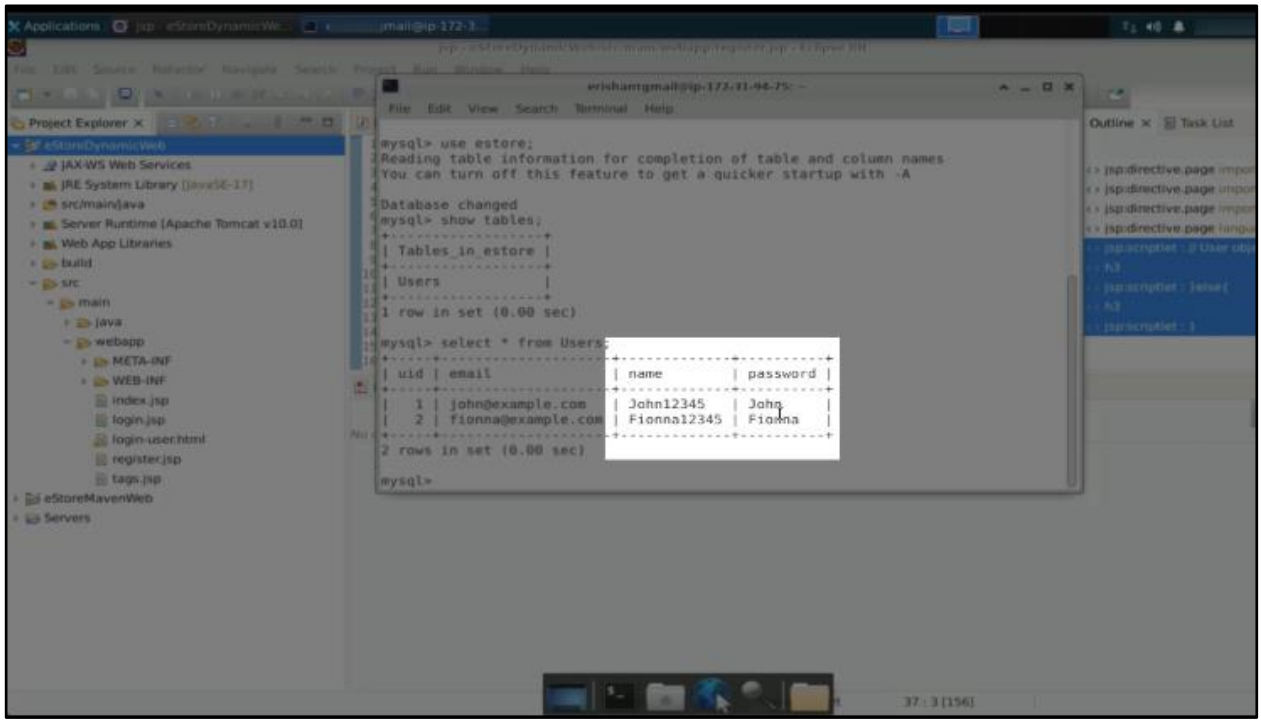
12.5 **Replace** the part



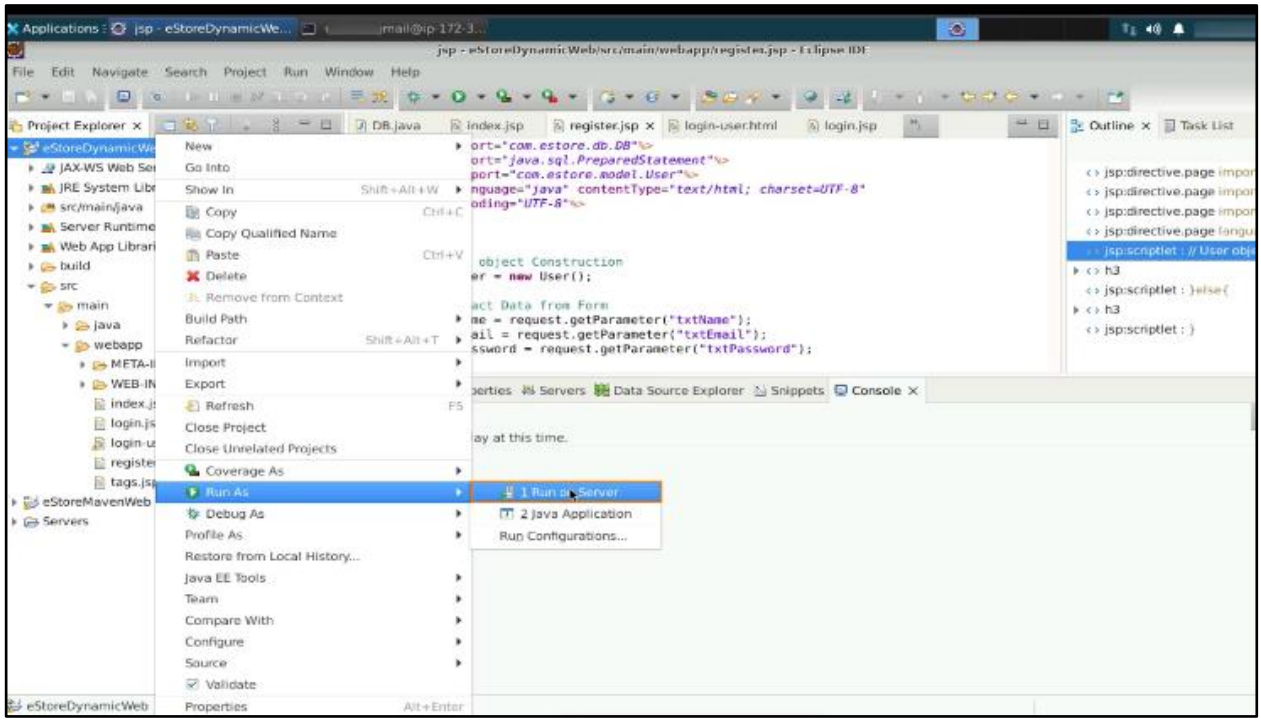
12.6 Paste it in the if case



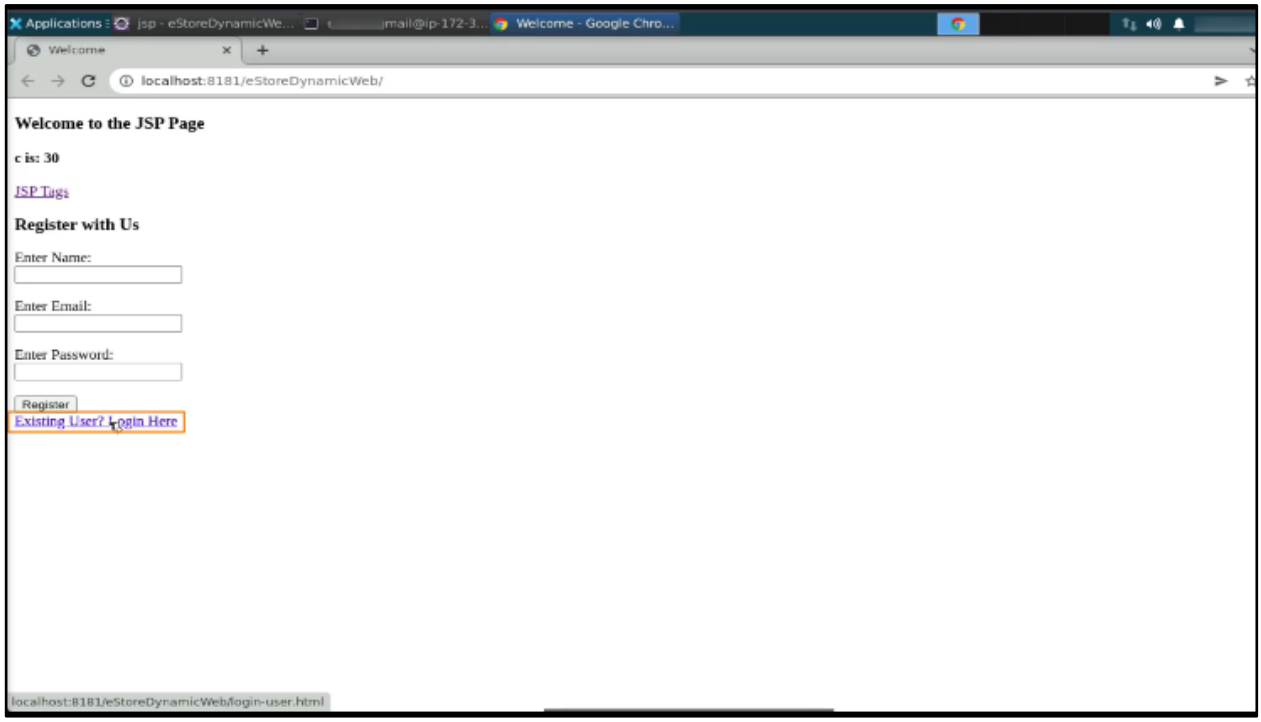
12.7 **Re-run** the application



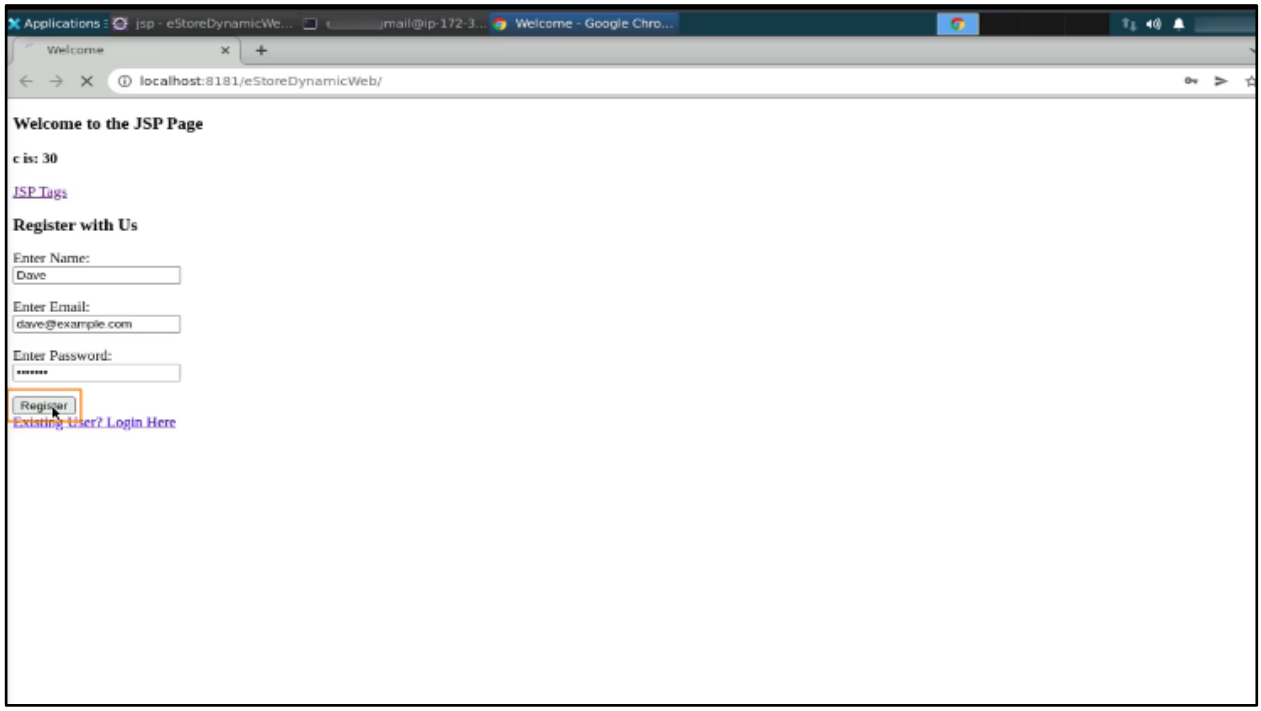
12.8 Click **Run on Server**



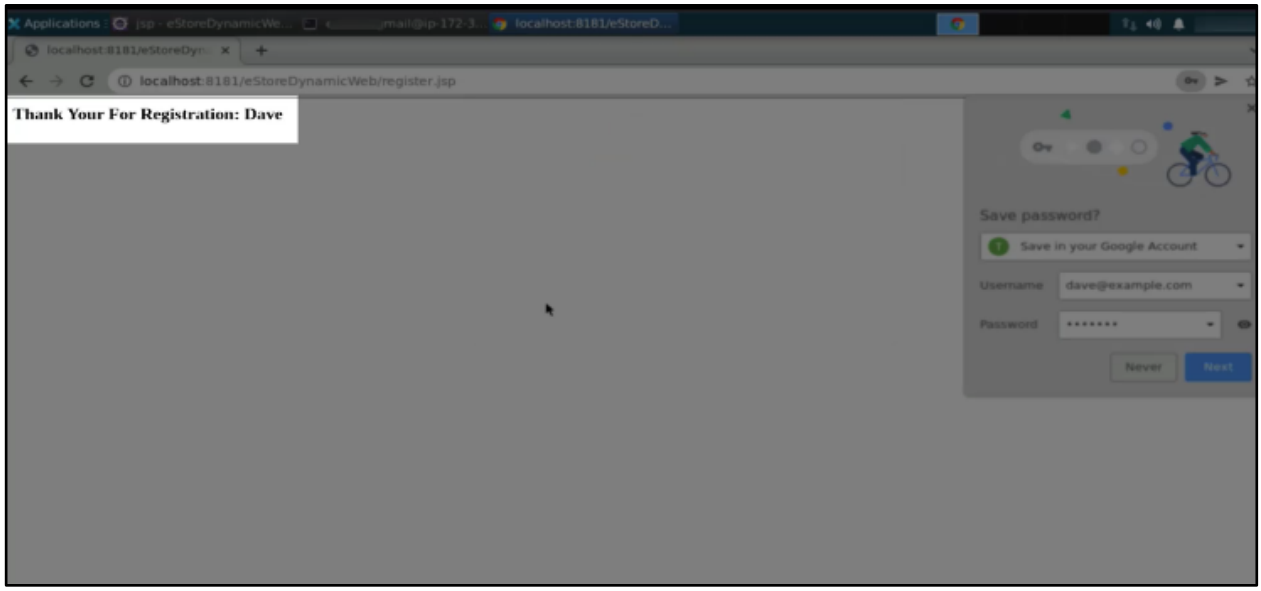
12.9 Now, there is an updated field in the form



12.10 Add the name, email, and password, and click on **Register**

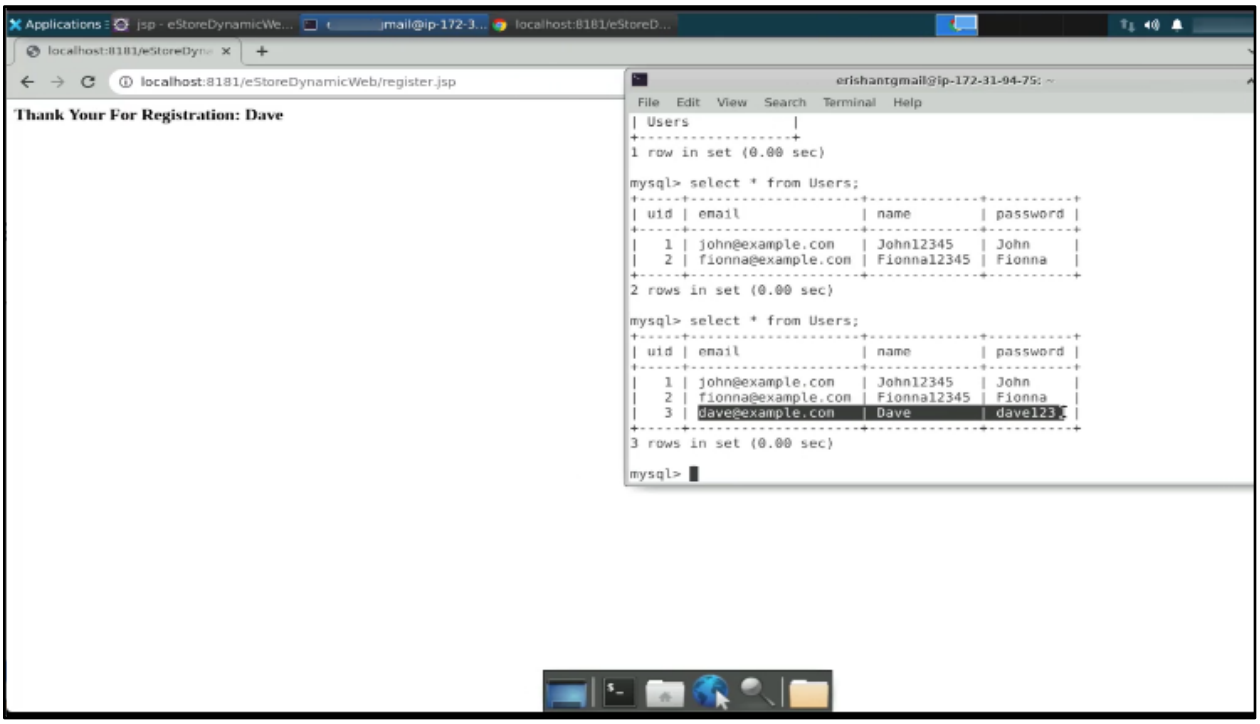


The output is as shown below:

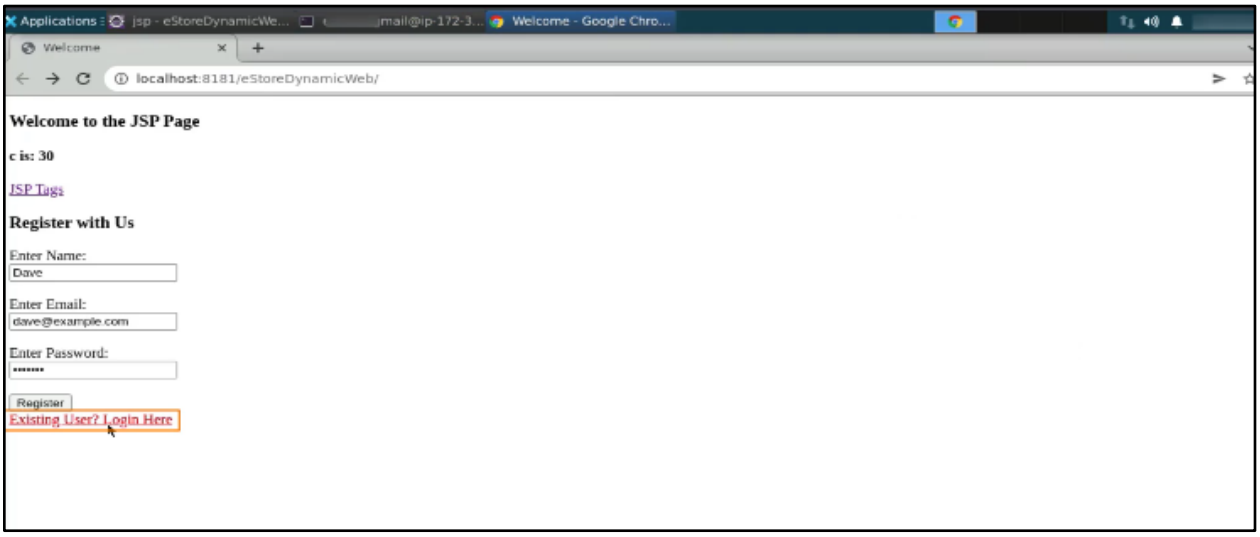


Step 13: Try to login using the link

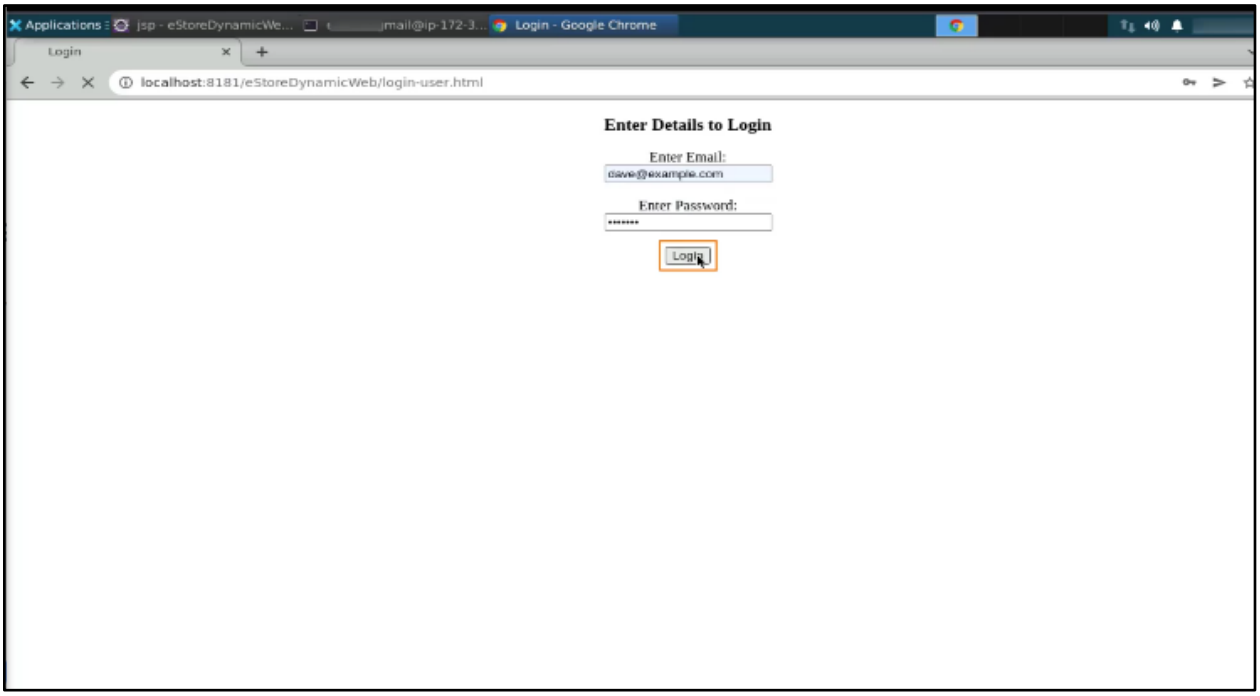
13.1 Enter **select * from Users;** in the terminal



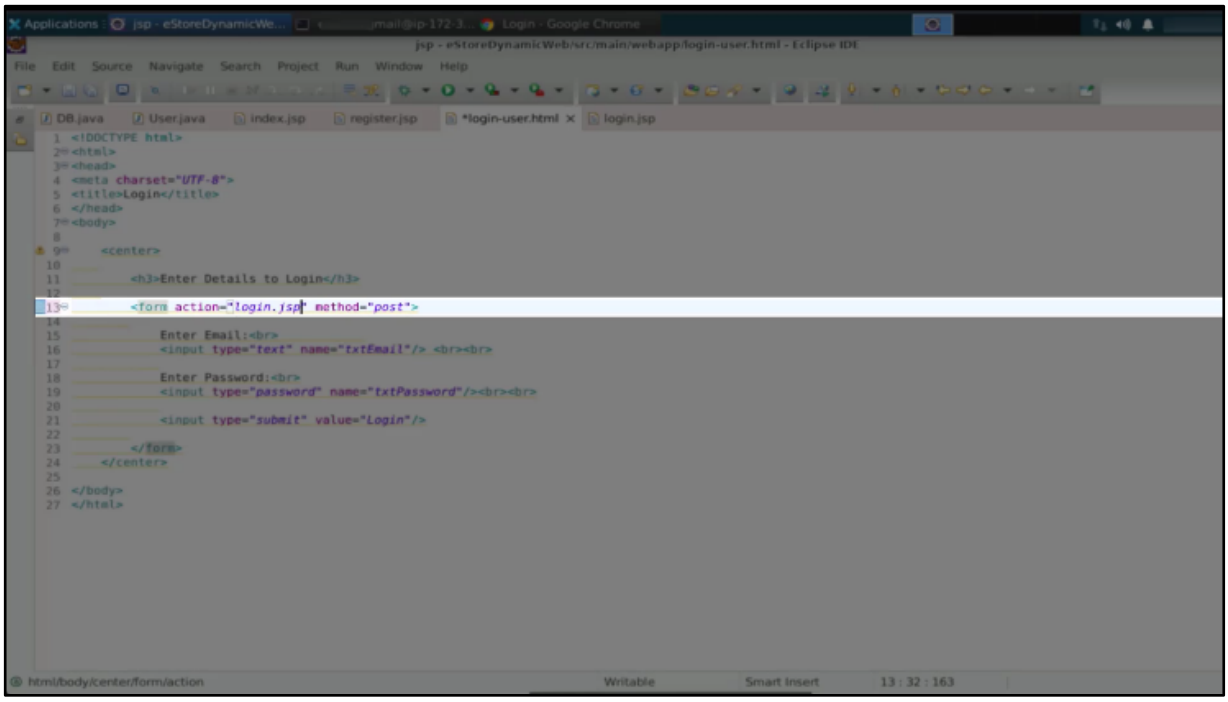
13.2 **Log in** using the **Existing User? Login Here** link



13.3 Enter the email and password and click **Login**

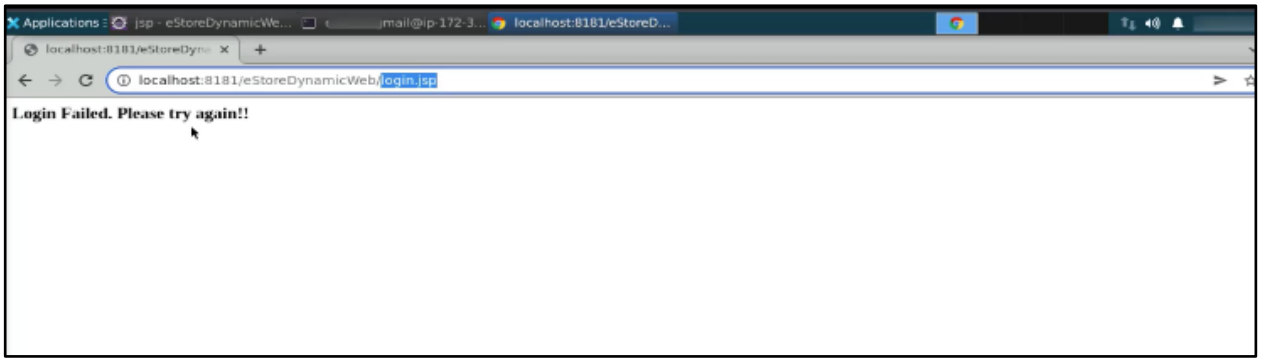


13.4 Add the **action as login.jsp** in the **login.user.html** file

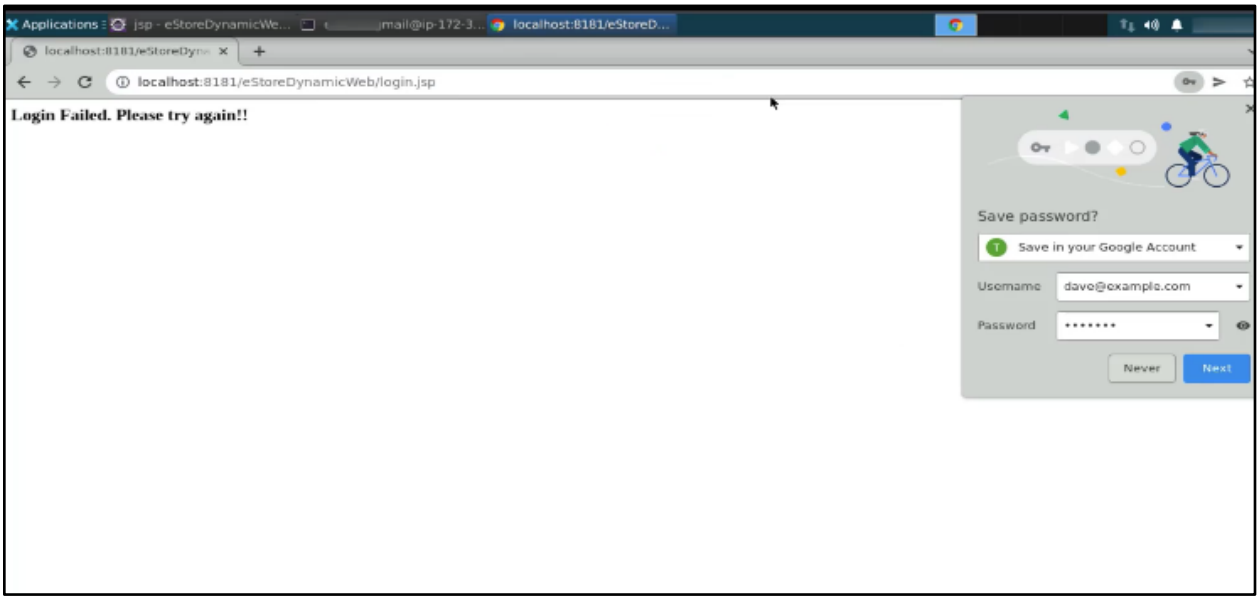


13.5 Enter the email and password again and click on **Login**

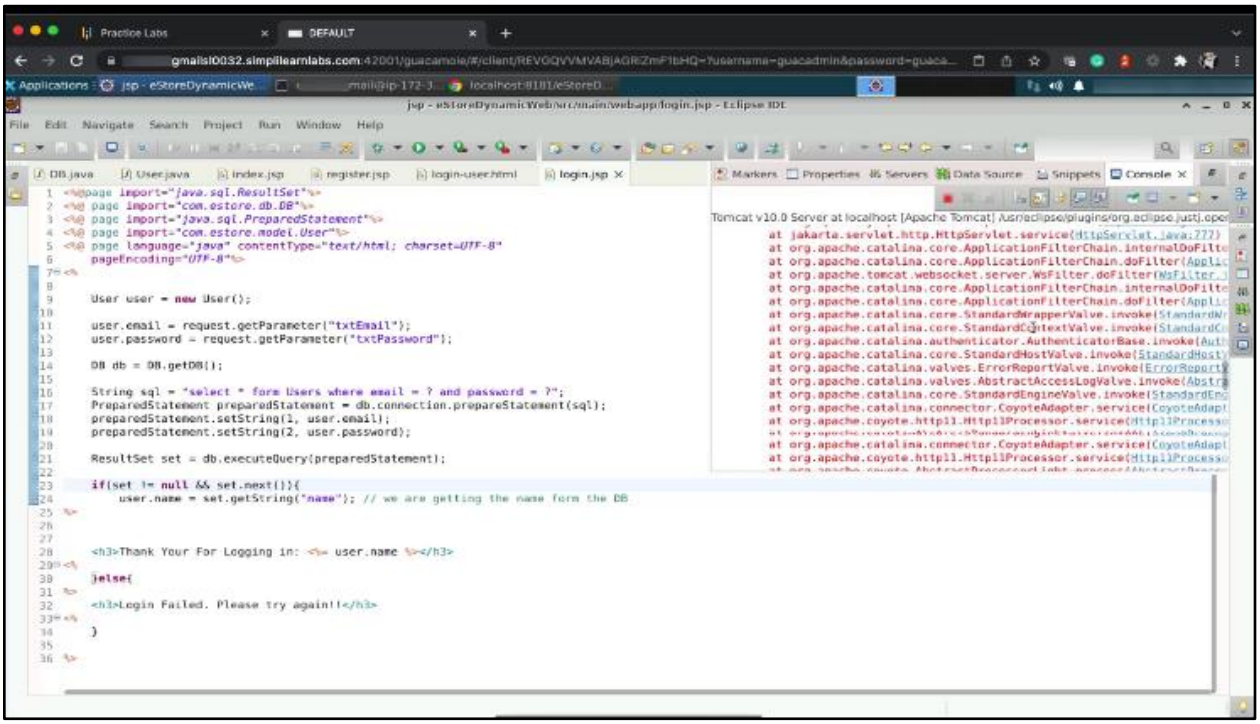
13.6 The Login Failed



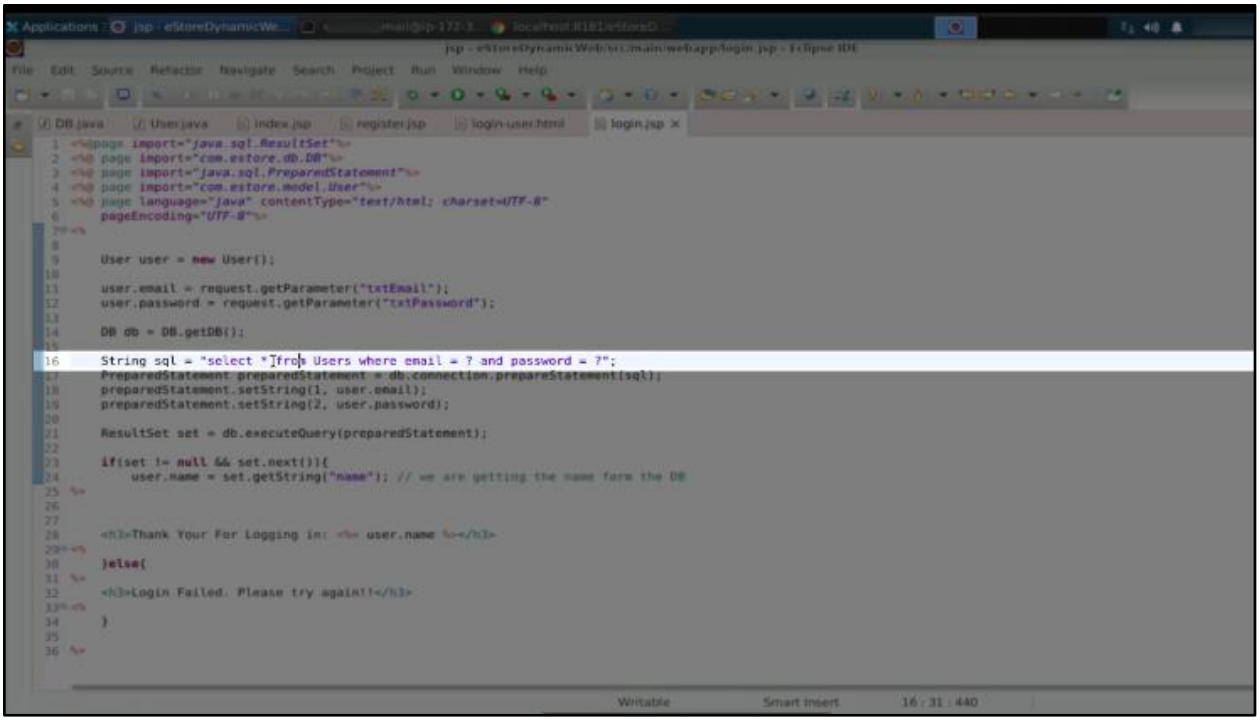
13.7 Re-enter the password and click **Login**



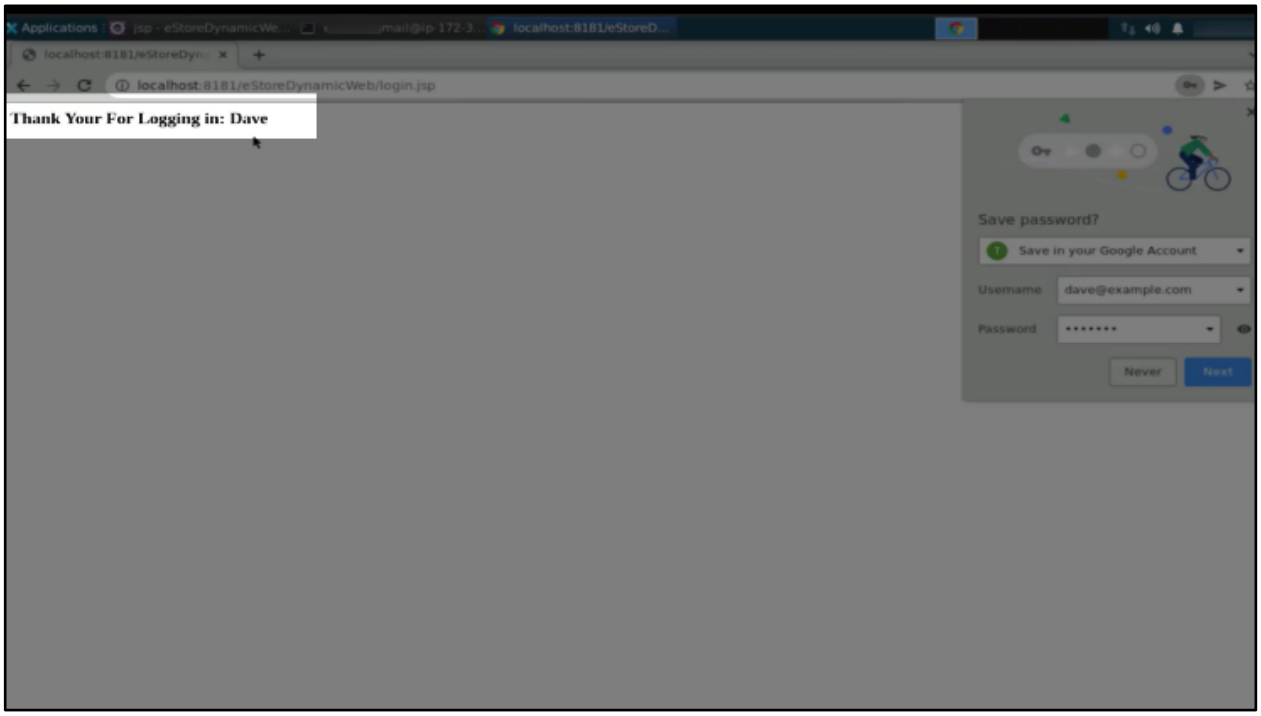
13.8 Some exceptions occurred as shown below:



13.9 Correct the **typing mistake**



13.10 Enter the email and password again



Following these steps, you have successfully explored JSP and JDBC and performed multiple operations on them.