

Lesson 01 Demo 01

Creating a Dynamic Web Project in Eclipse IDE with Servlet

Objective: To create a dynamic web project using Eclipse IDE and make the Servlet work with responses

Tools Required: Eclipse IDE

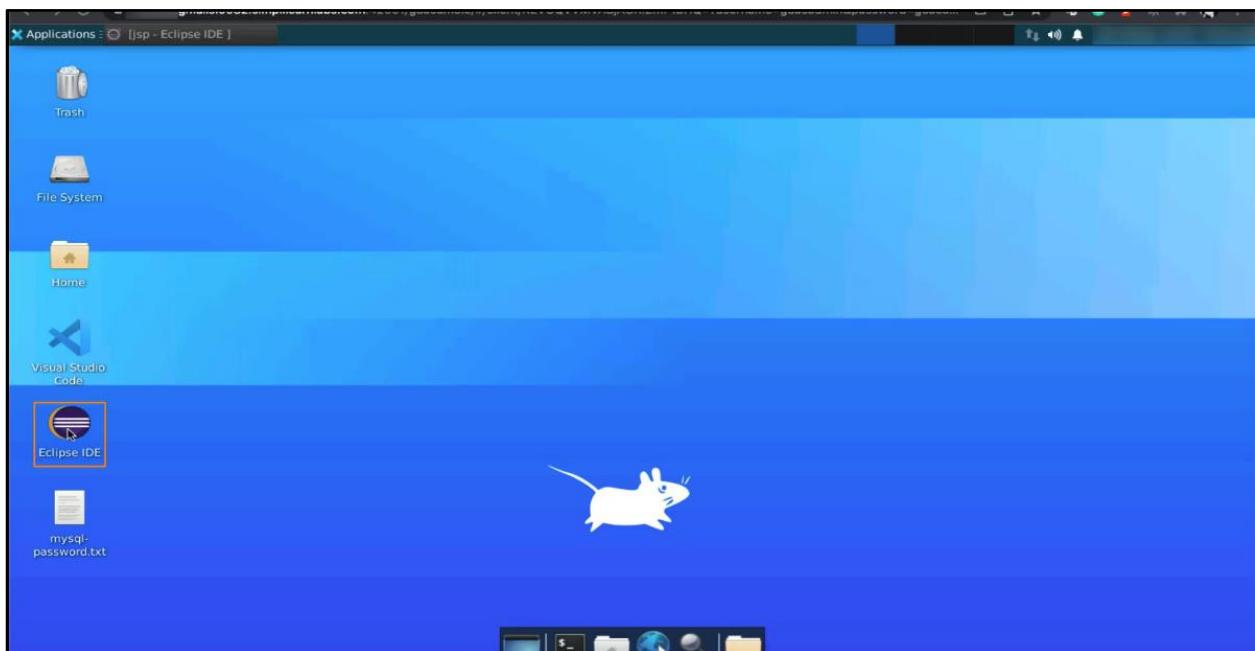
Prerequisites: None

Steps to be followed:

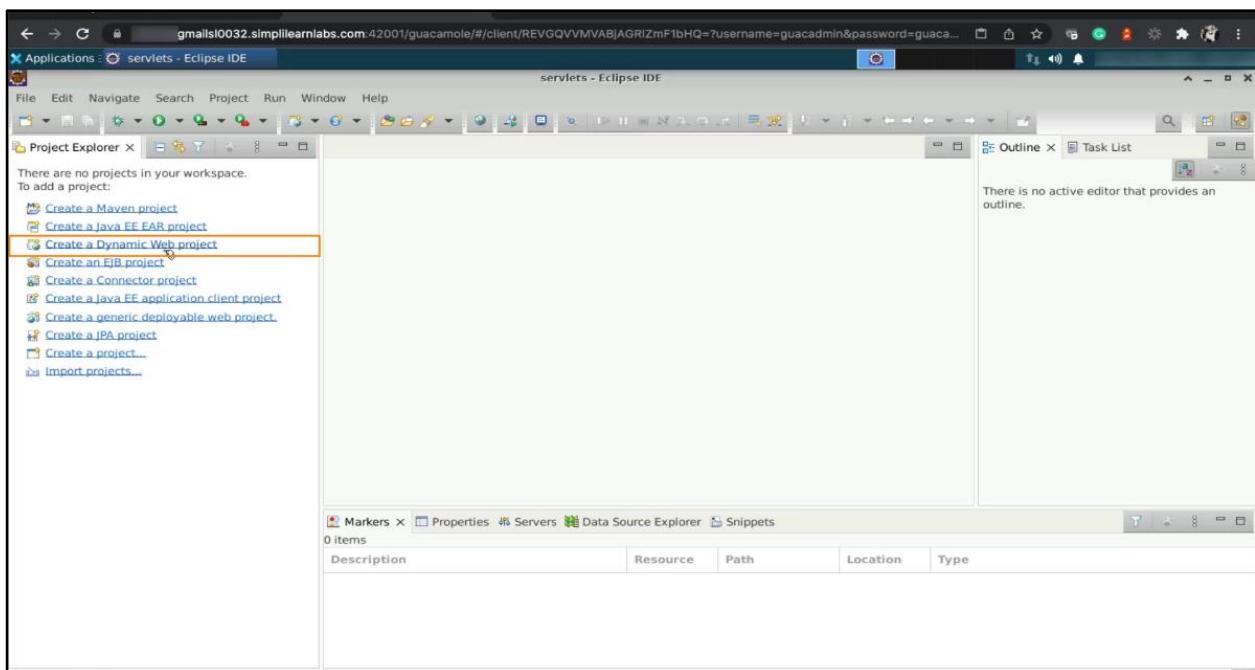
1. Create a new project
2. Create a server
3. Create a new HTML file
4. Create a Servlet
5. Run the project and handle the error
6. Make the Servlet work with a response

Step 1: Create a new project

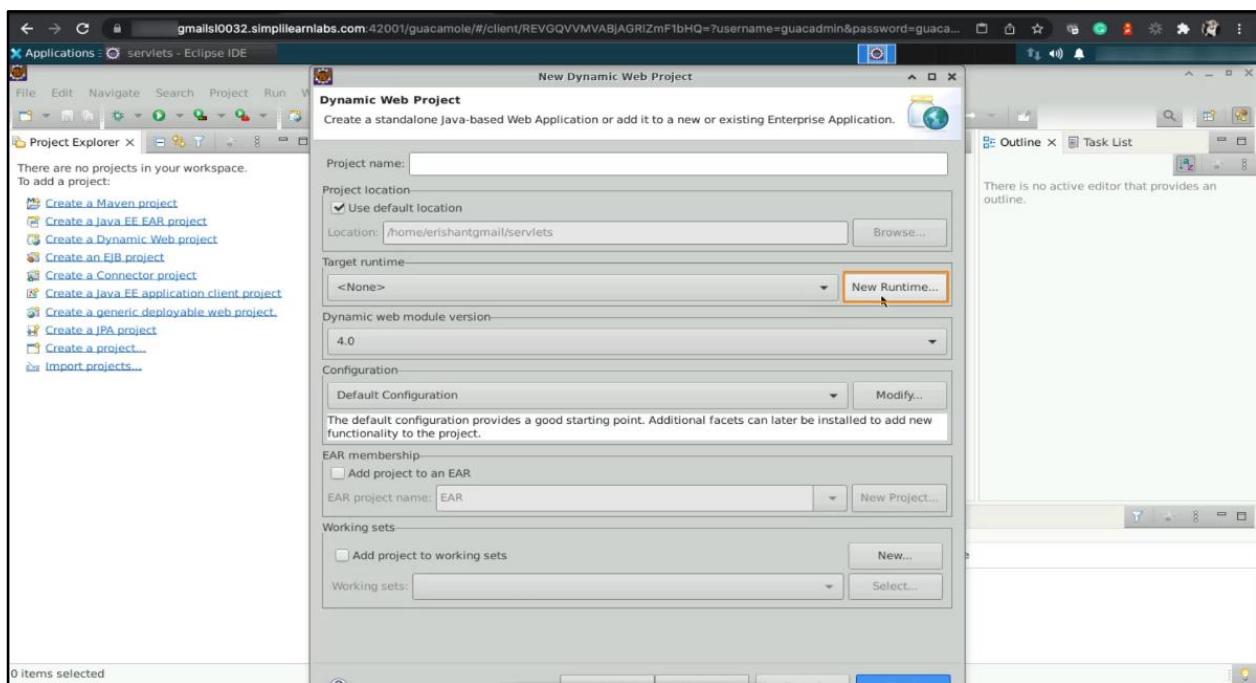
1.1 Open Eclipse IDE



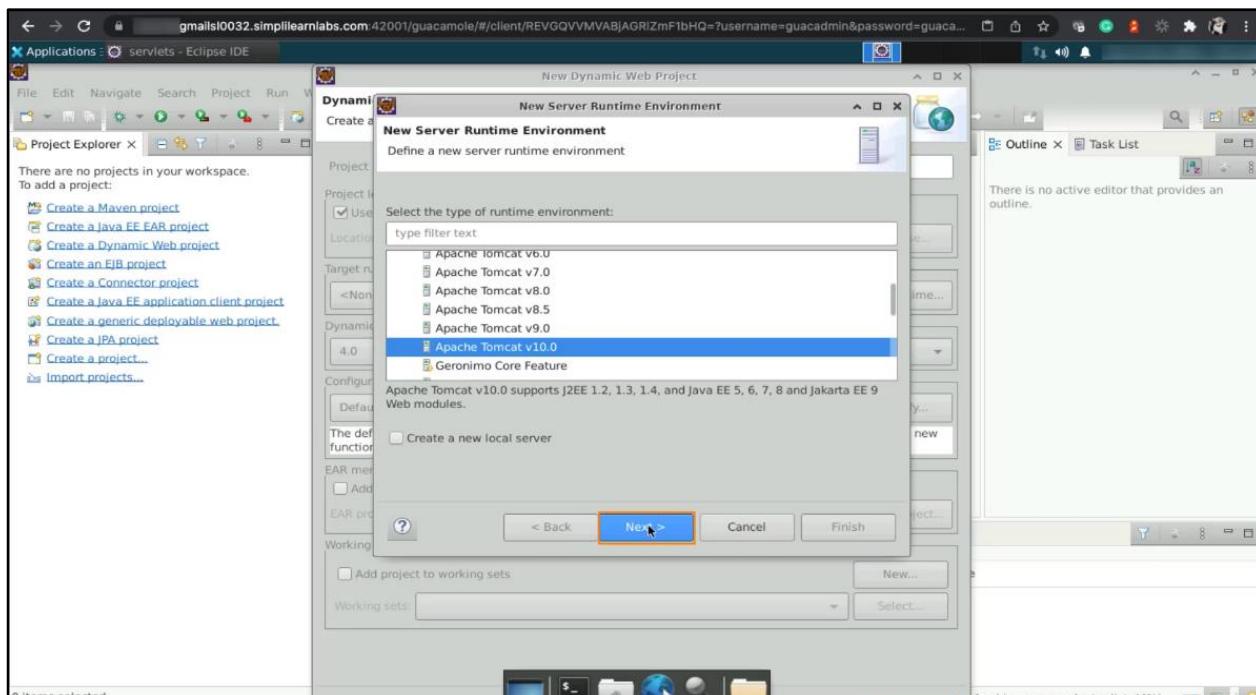
1.2 Click on the Create a Dynamic Web Project option



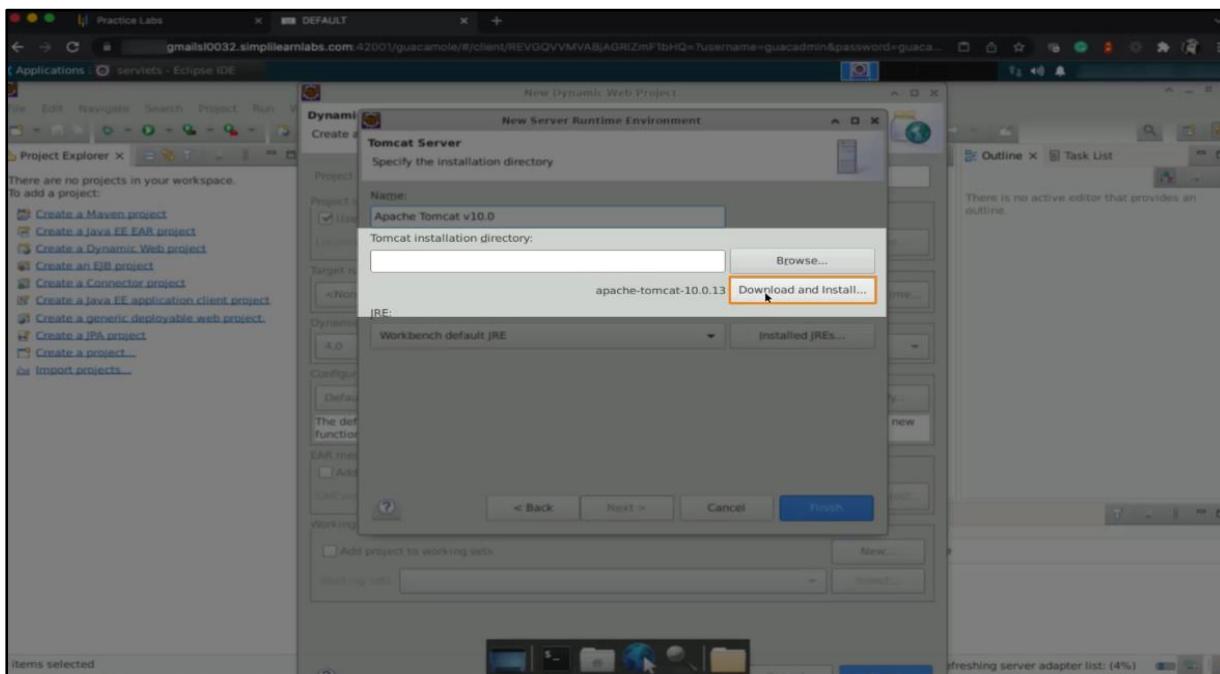
1.3 Specify the Target Runtime. Since it is empty, click on the New Runtime option



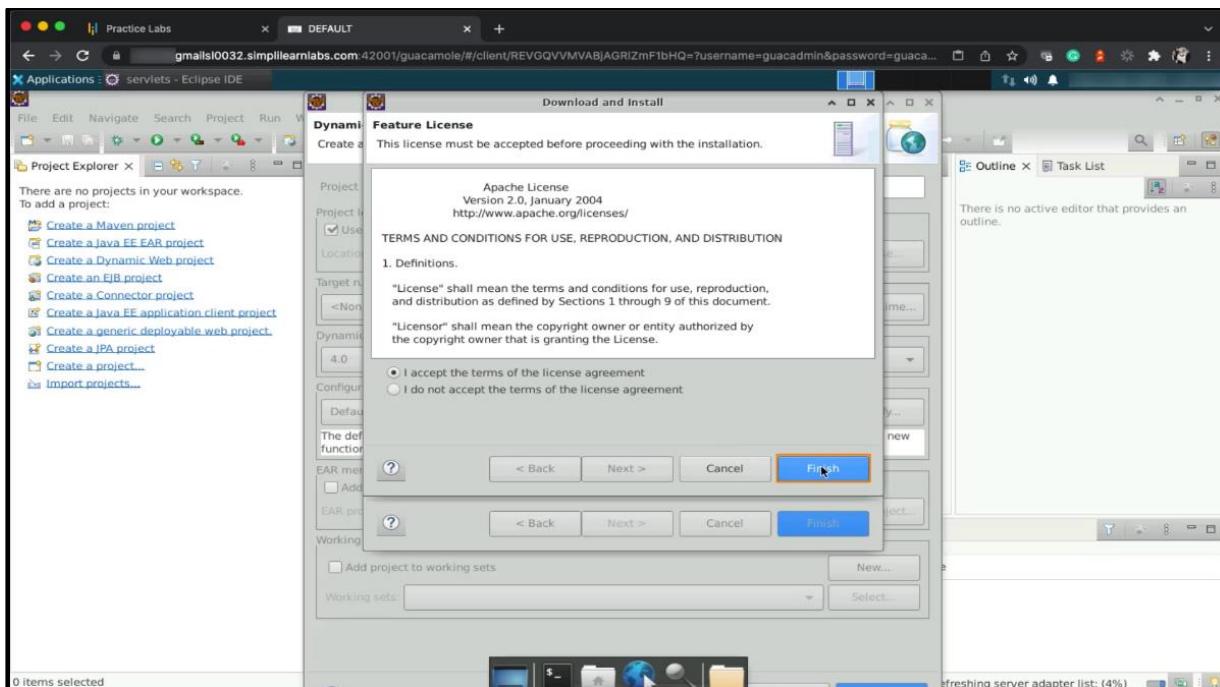
1.4 Select the Apache Tomcat version v10.0 and click on Next



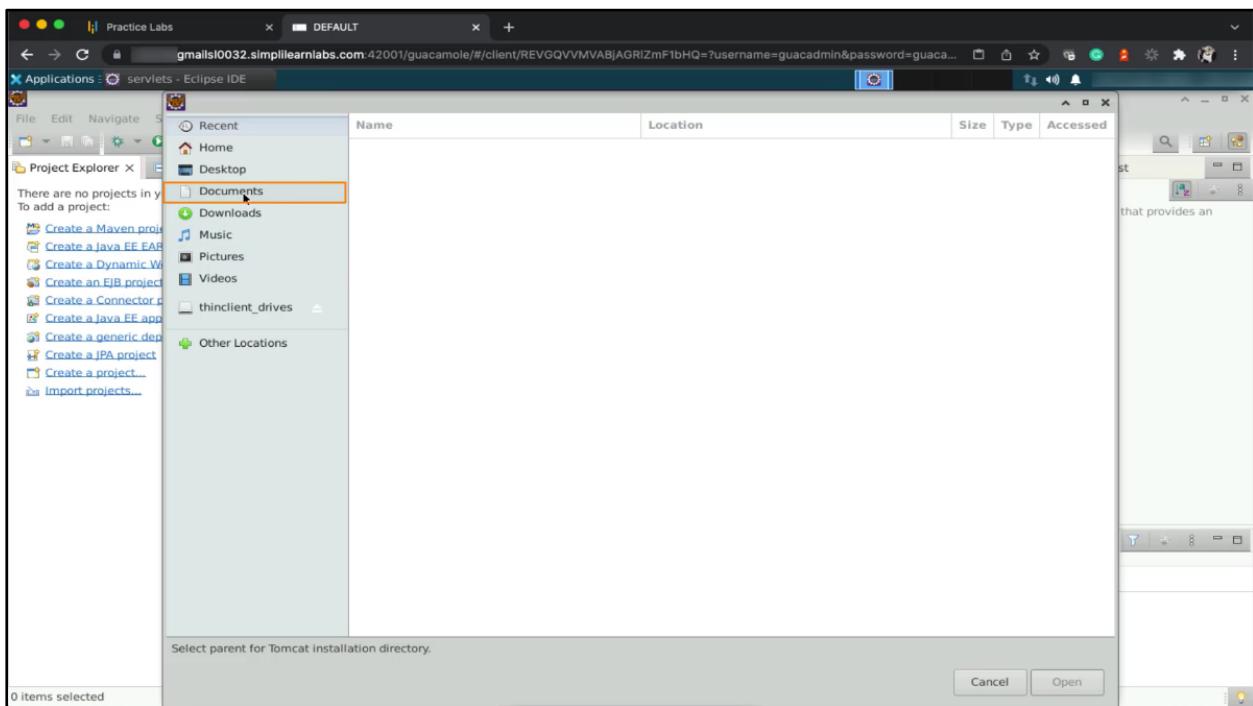
1.5 Click on the Download and Install button



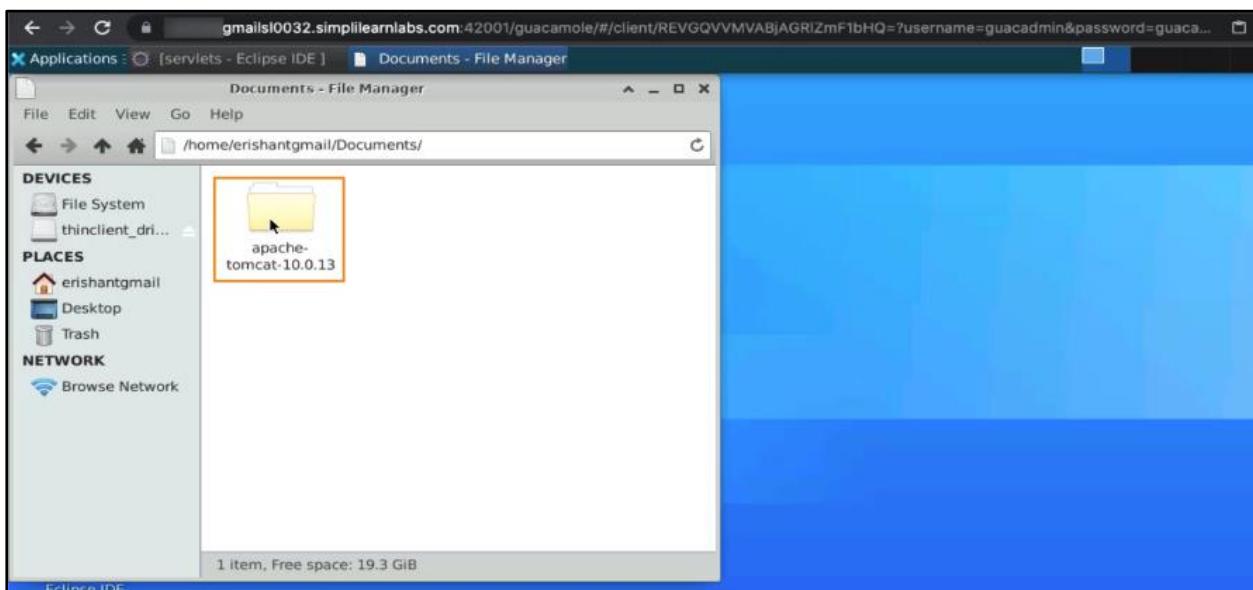
1.6 Accept the terms and conditions, and then click on Finish



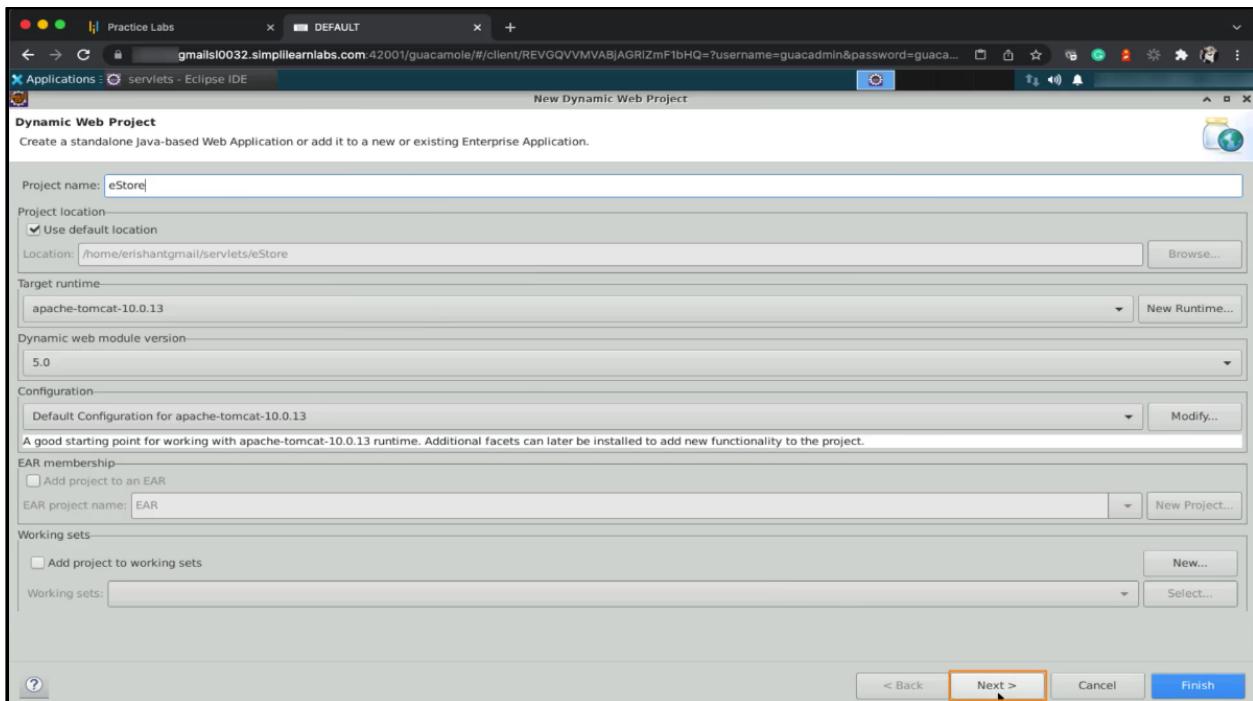
1.7 Select **Documents**, and then click on **Open**



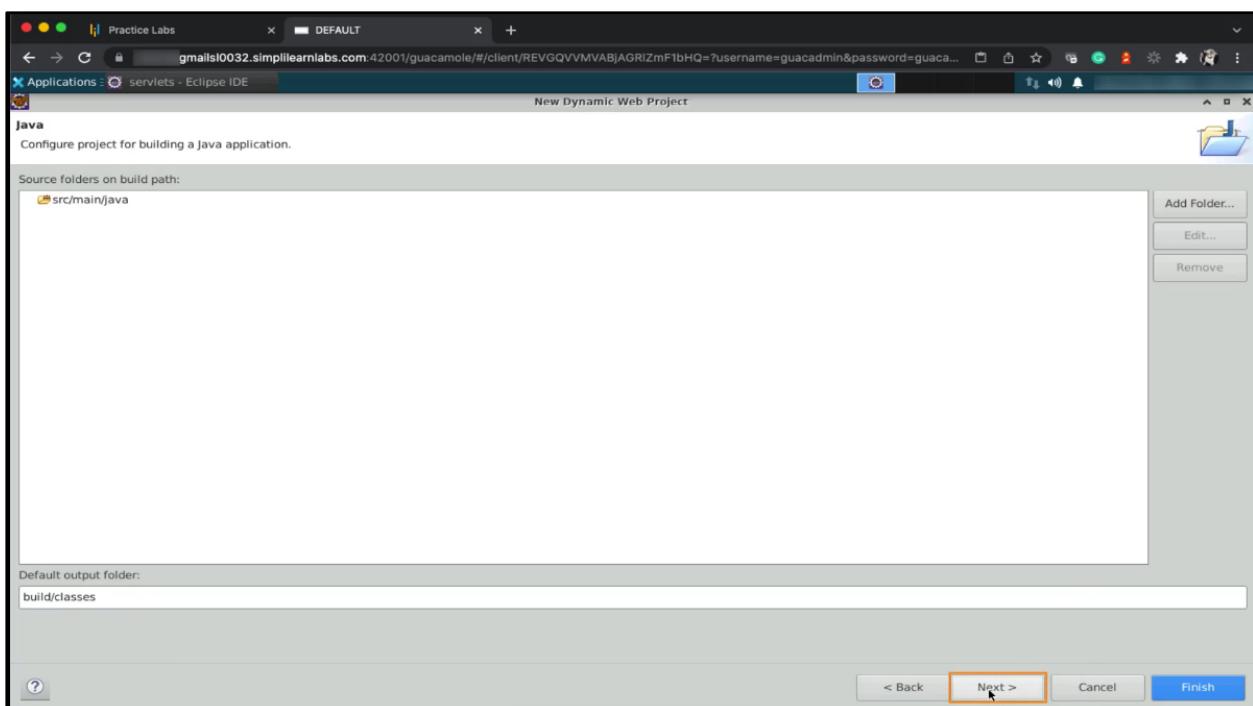
1.8 To check if Tomcat is installed, go to the **Documents** folder, and you can check if the **apache-tomcat-10.0.13** file is available



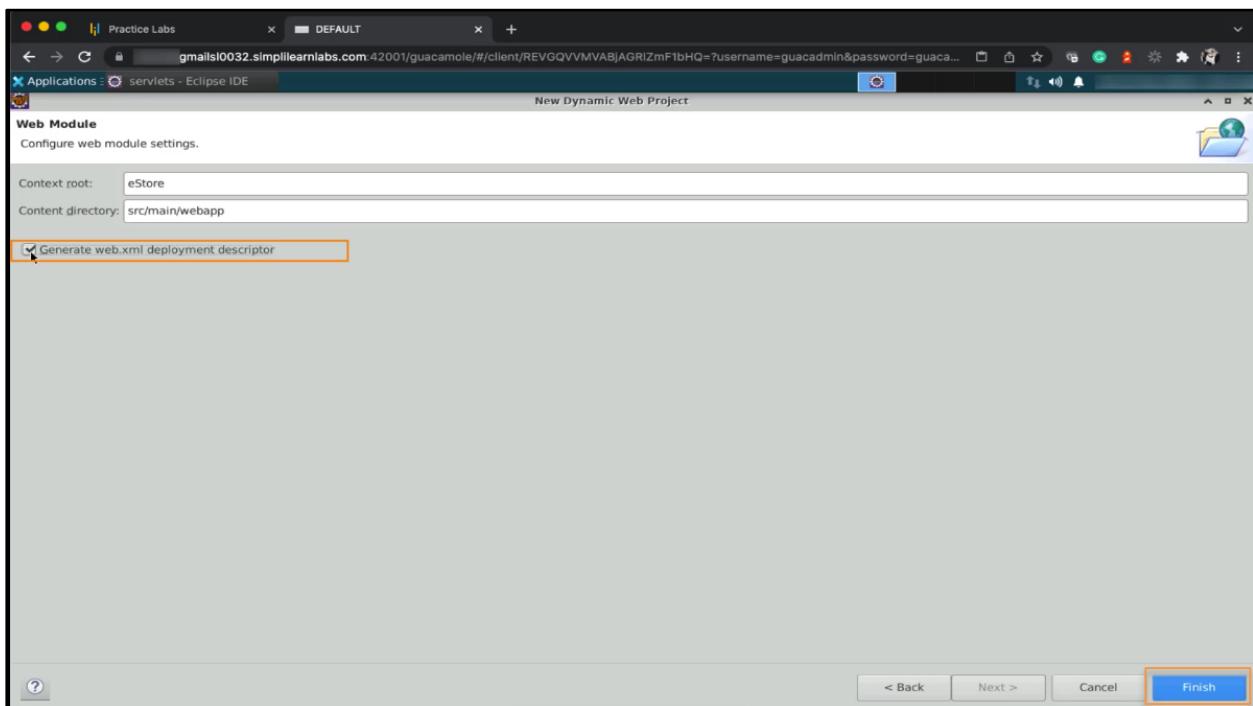
1.9 Go back to **Eclipse IDE** and fill in the details, like the project name. Enter the name as **eStore** and click on **Next**



You can see the source directory created. Click on **Next**



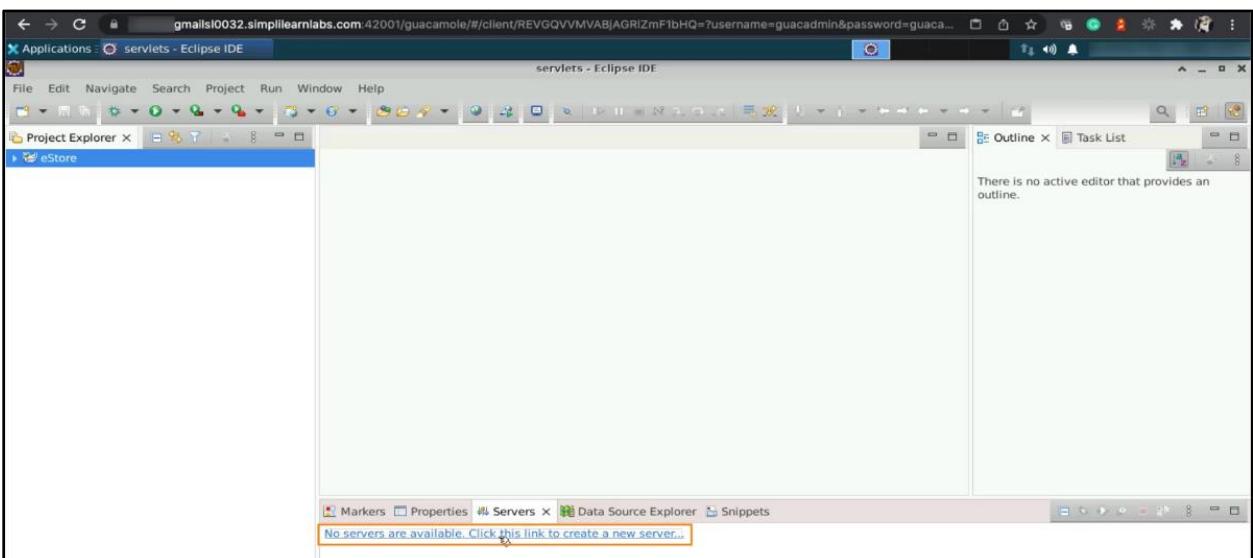
1.10 Select the option **Generate web.xml deployment descriptor** and then click on **Finish**



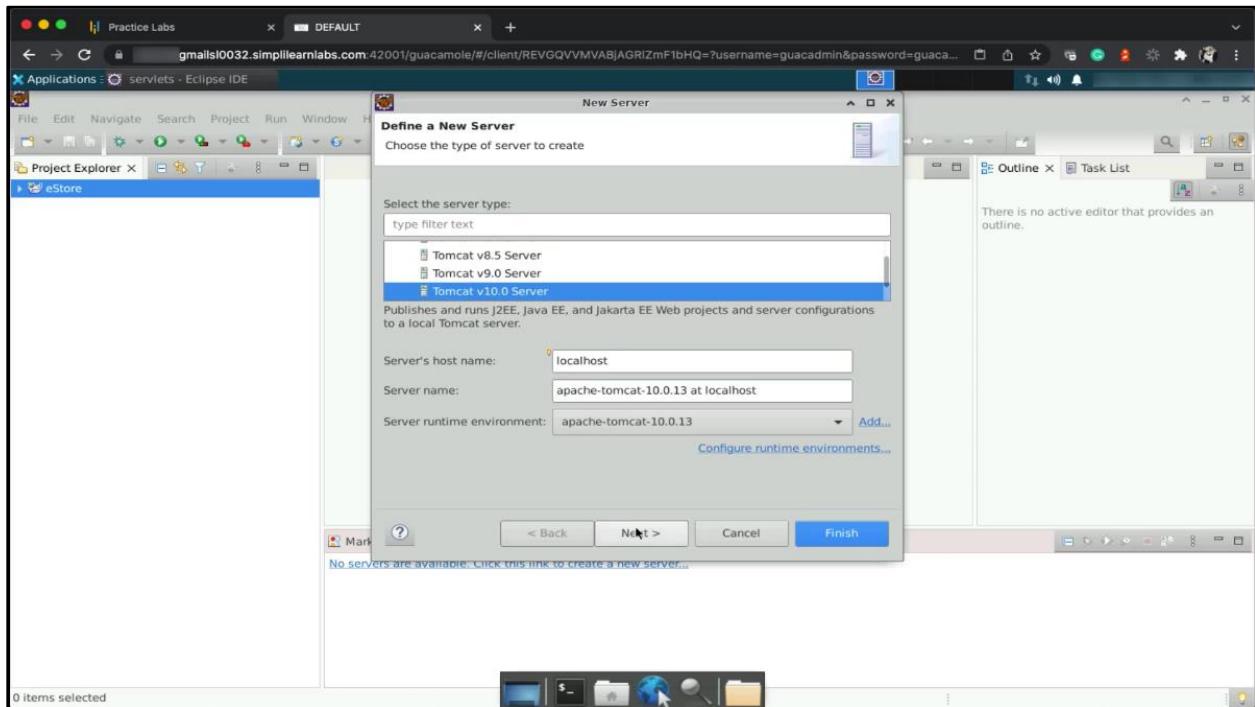
The dynamic web project is now created.

Step 2: Create a server

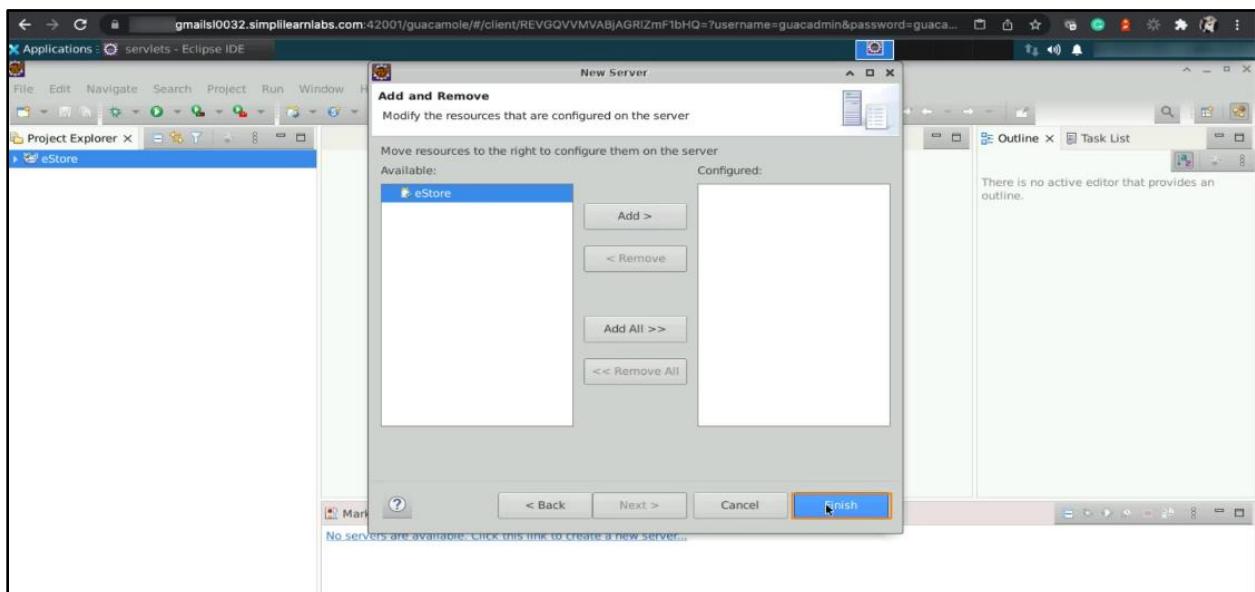
2.1 Now, go to the **Server** tab, and click on the link to **create a new server**



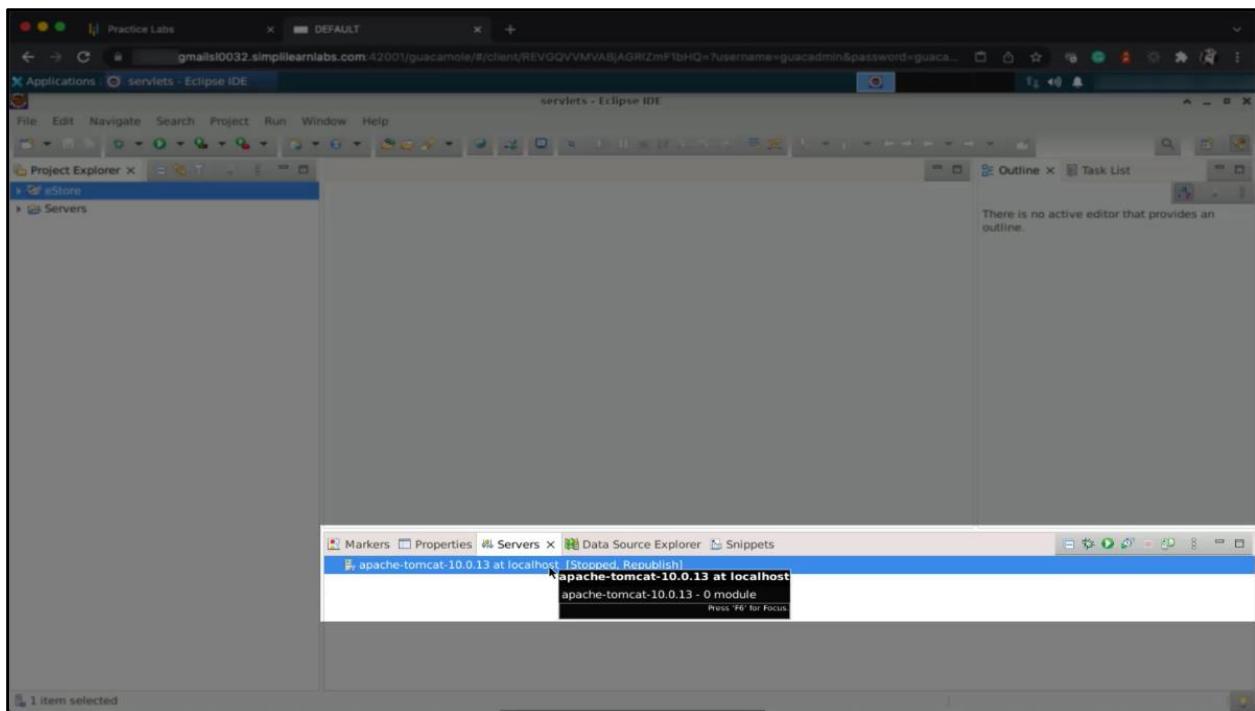
2.2 Select the Apache Tomcat v.10.0 Server and click on Next



2.3 Select the eStore project and click on Finish



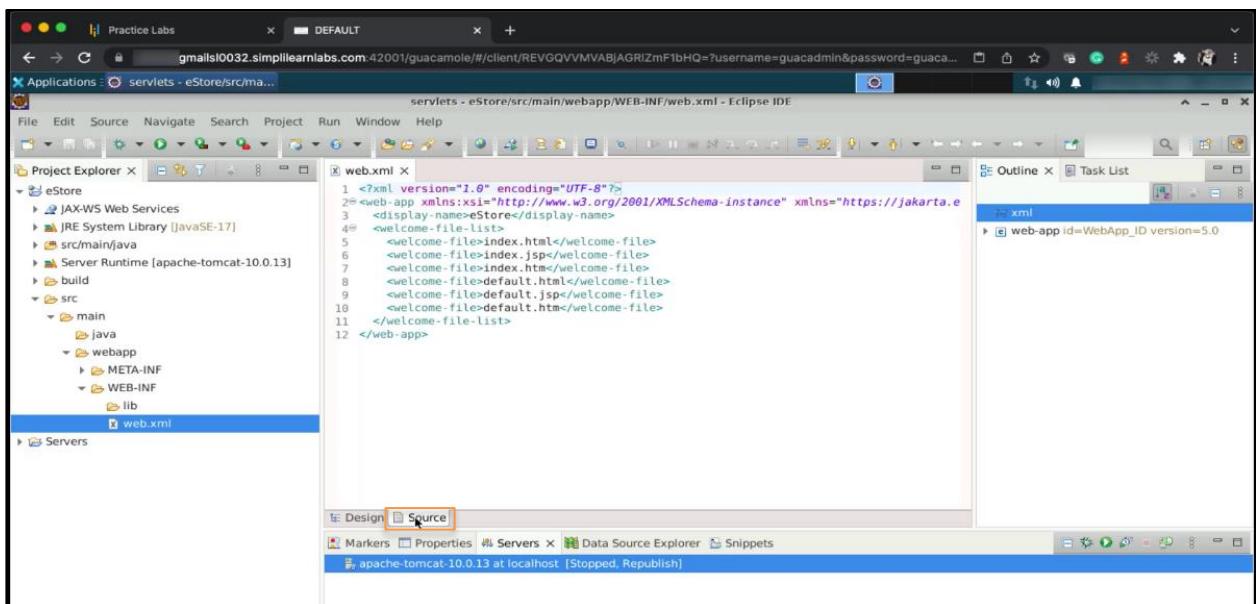
The server **apache-tomcat-10.0.13 at localhost** has been linked.



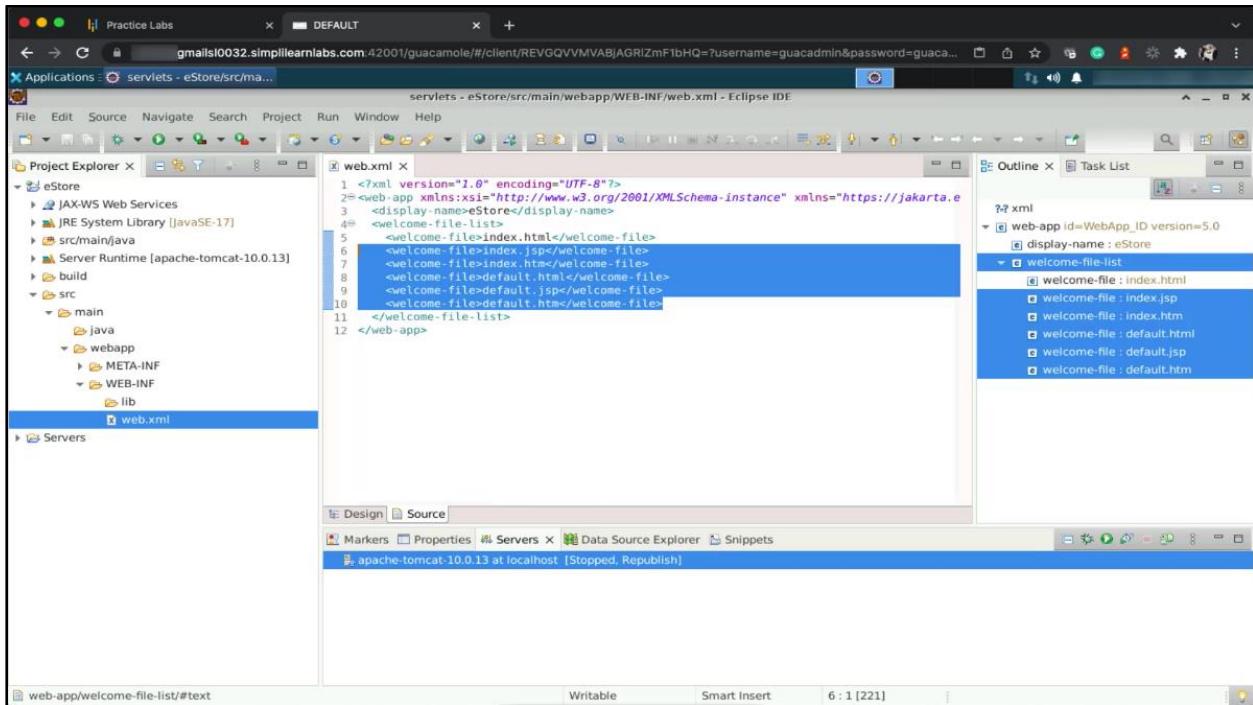
This is how you can configure the server for your project.

Step 3: Create a new HTML file

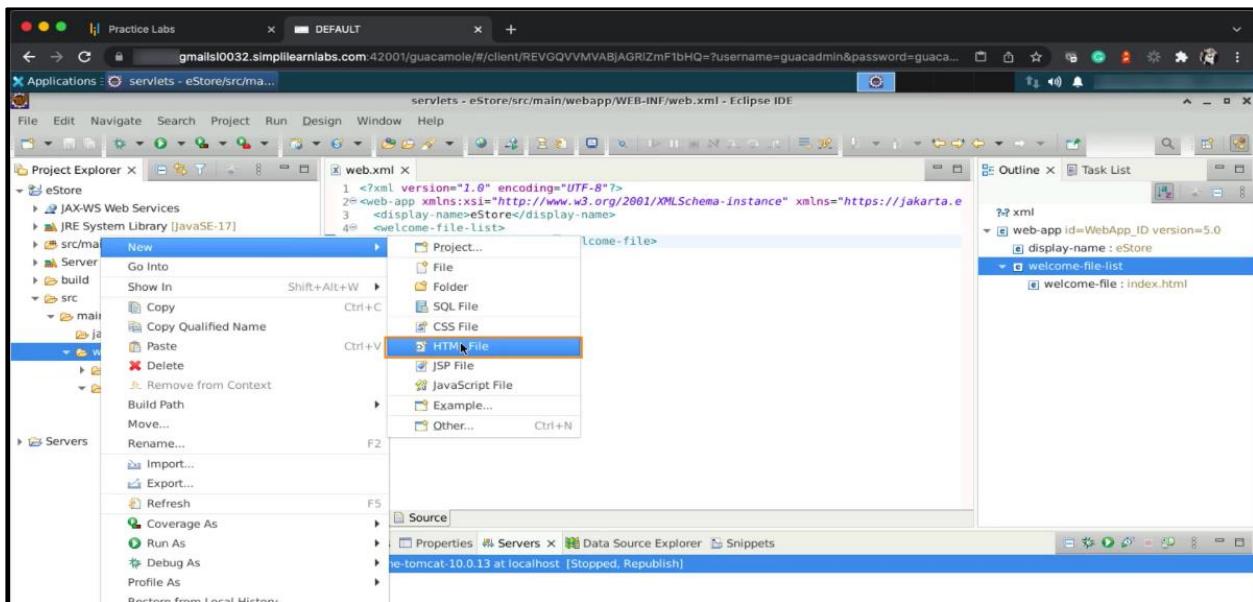
3.1 Open the **web.xml** file from **eStore** -> **src** -> **webapp** -> **WEB-INF** -> **web.xml** -> **Source**



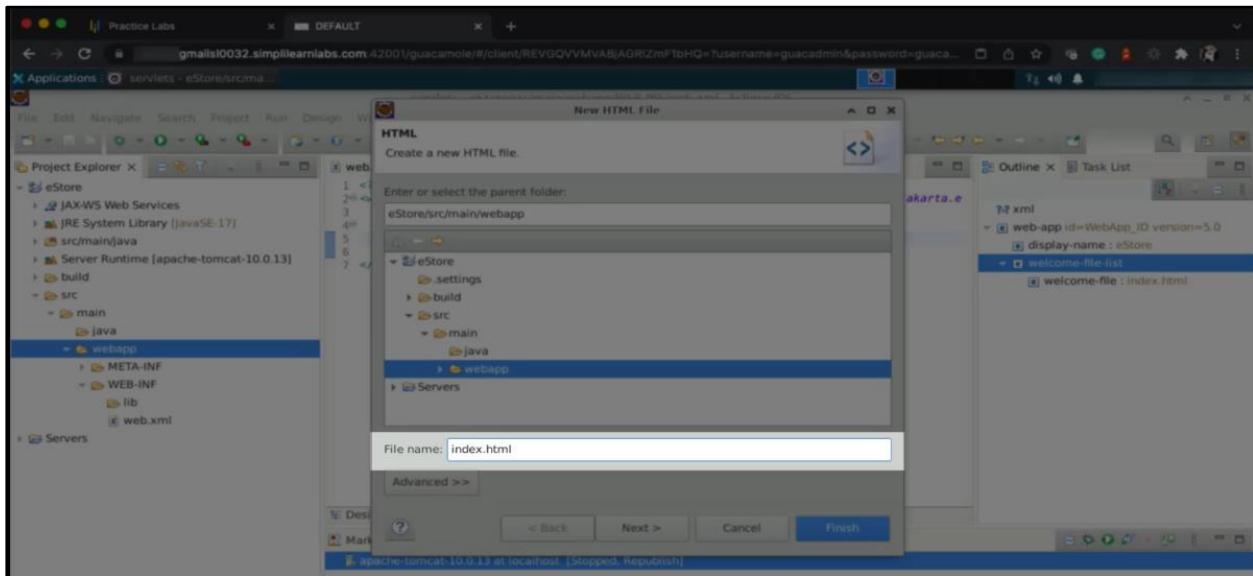
3.2 Delete all the welcome files (from lines 6 to 10)



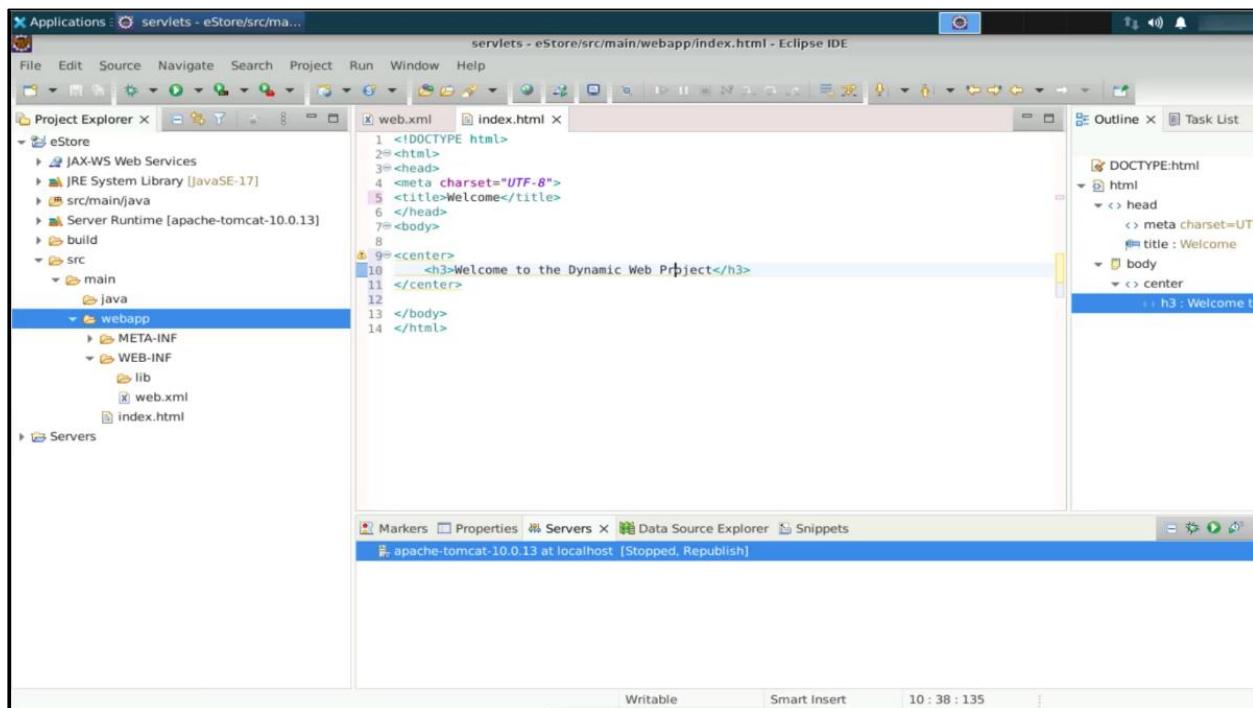
3.3 In the **webapp** folder, create a new HTML file. Right-click on **webapp**, select **New**, and click on **HTML File**.



3.4 Name the file **index.html**, and click on **Finish**

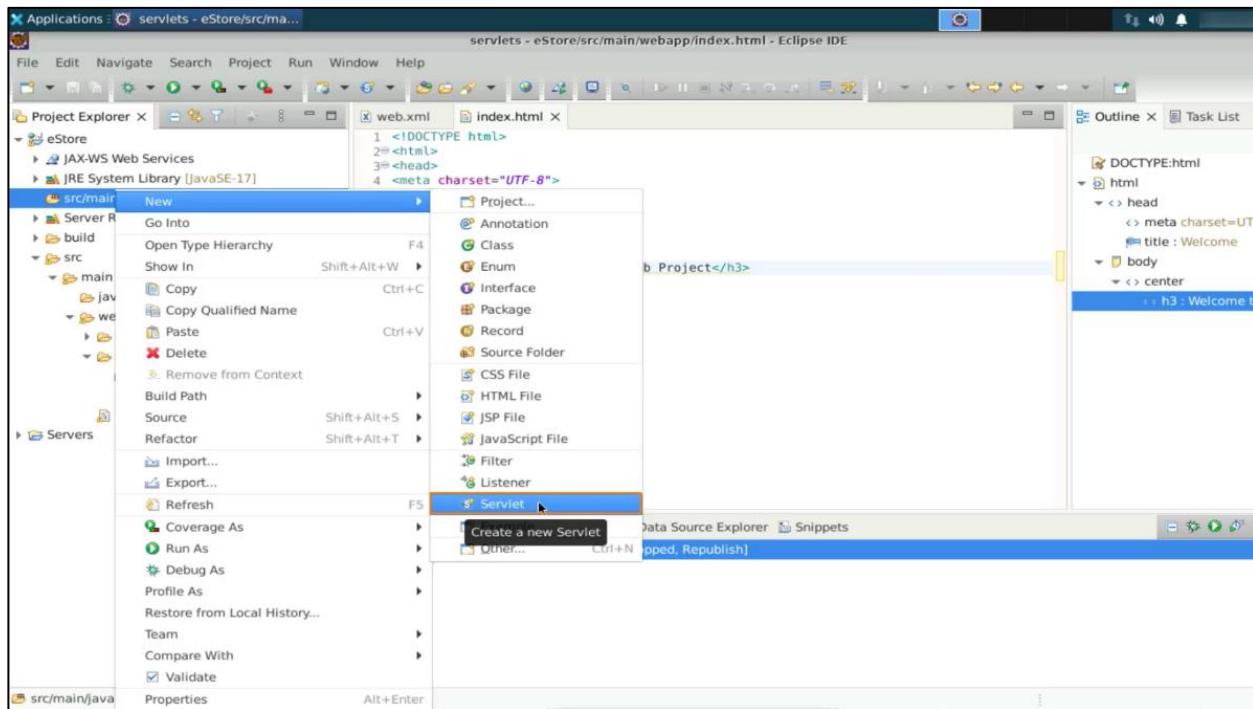


3.5 Change the title tag message **Welcome** and create a **center** tag in the body to print **Welcome to the Dynamic Web Project**. This message will automatically come up whenever this project gets executed (from lines 5 to 10)

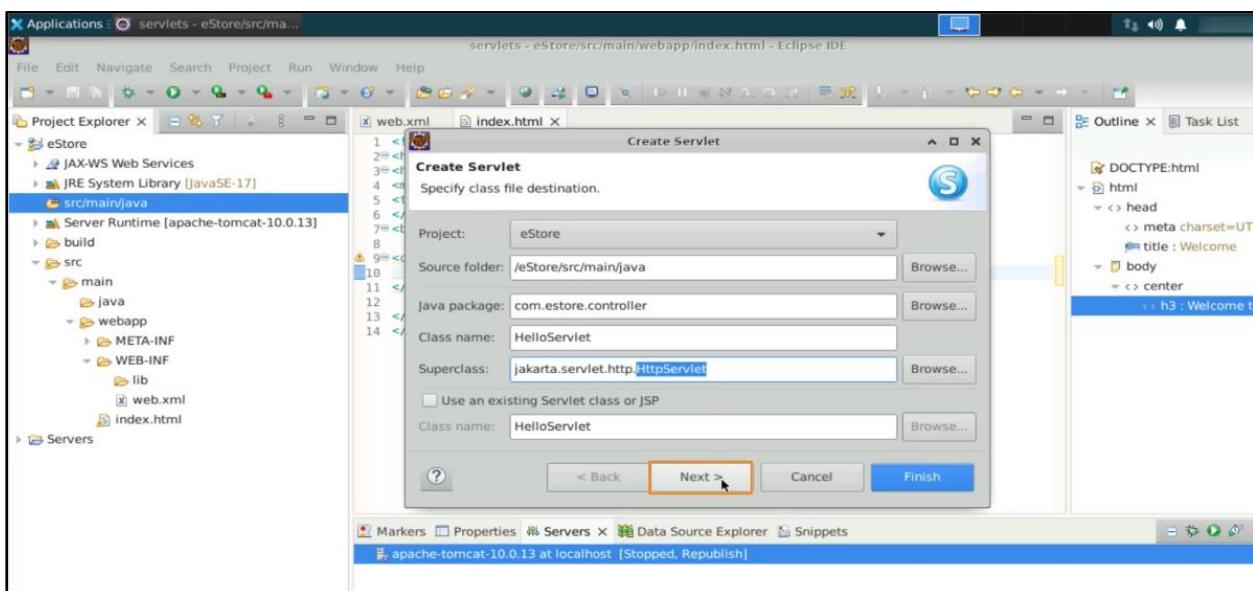


Step 4: Create a Servlet

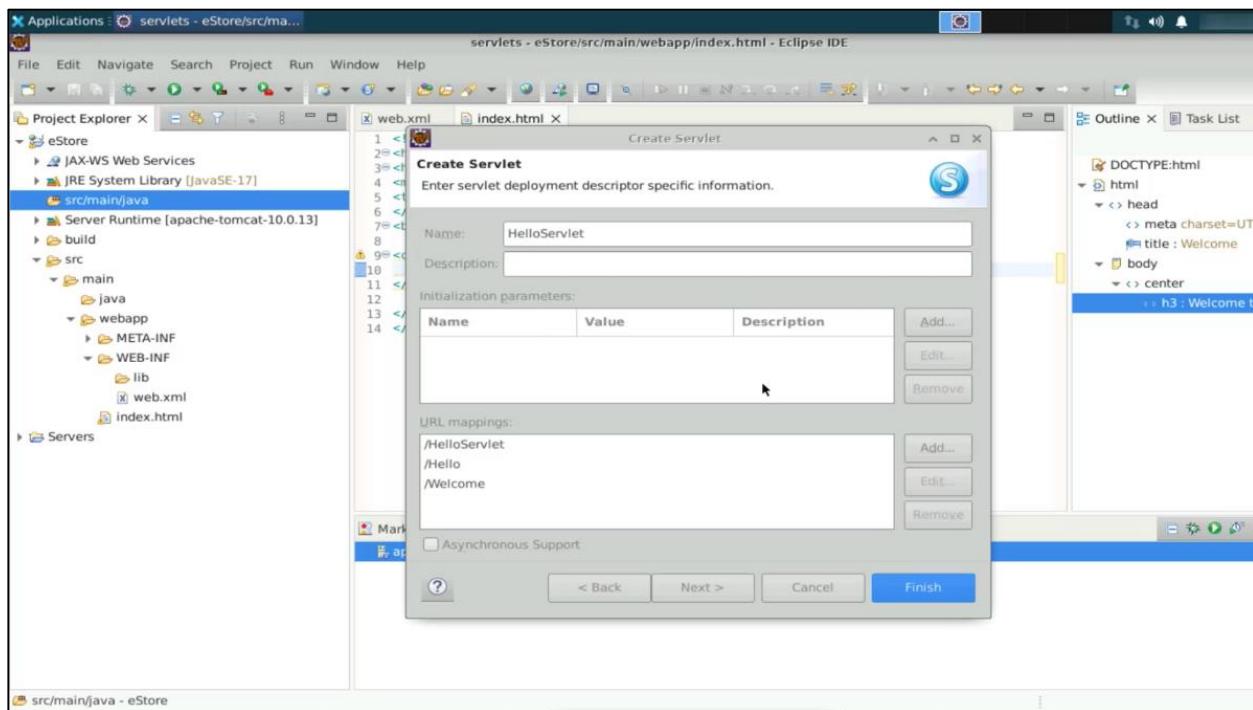
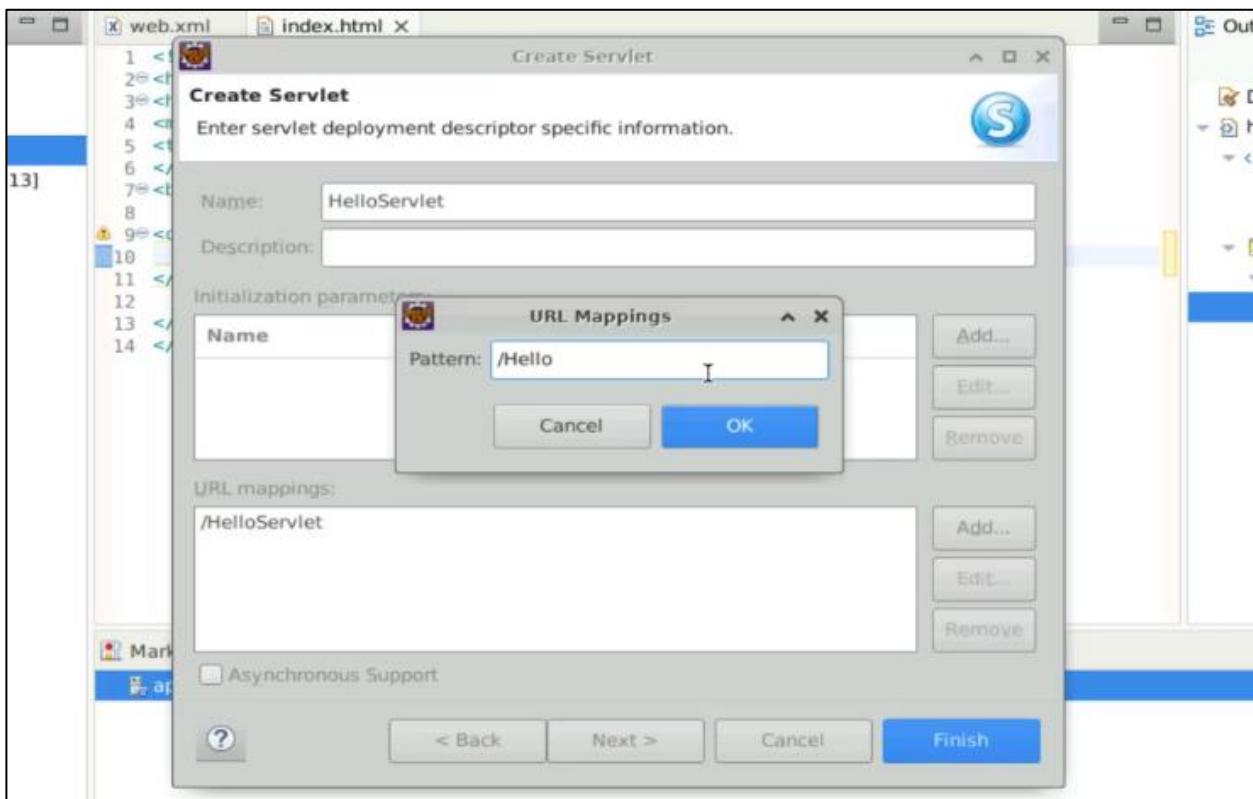
4.1 Now, create a Servlet. Go to **src/main/java**, right-click on it, and select **New > Servlet**



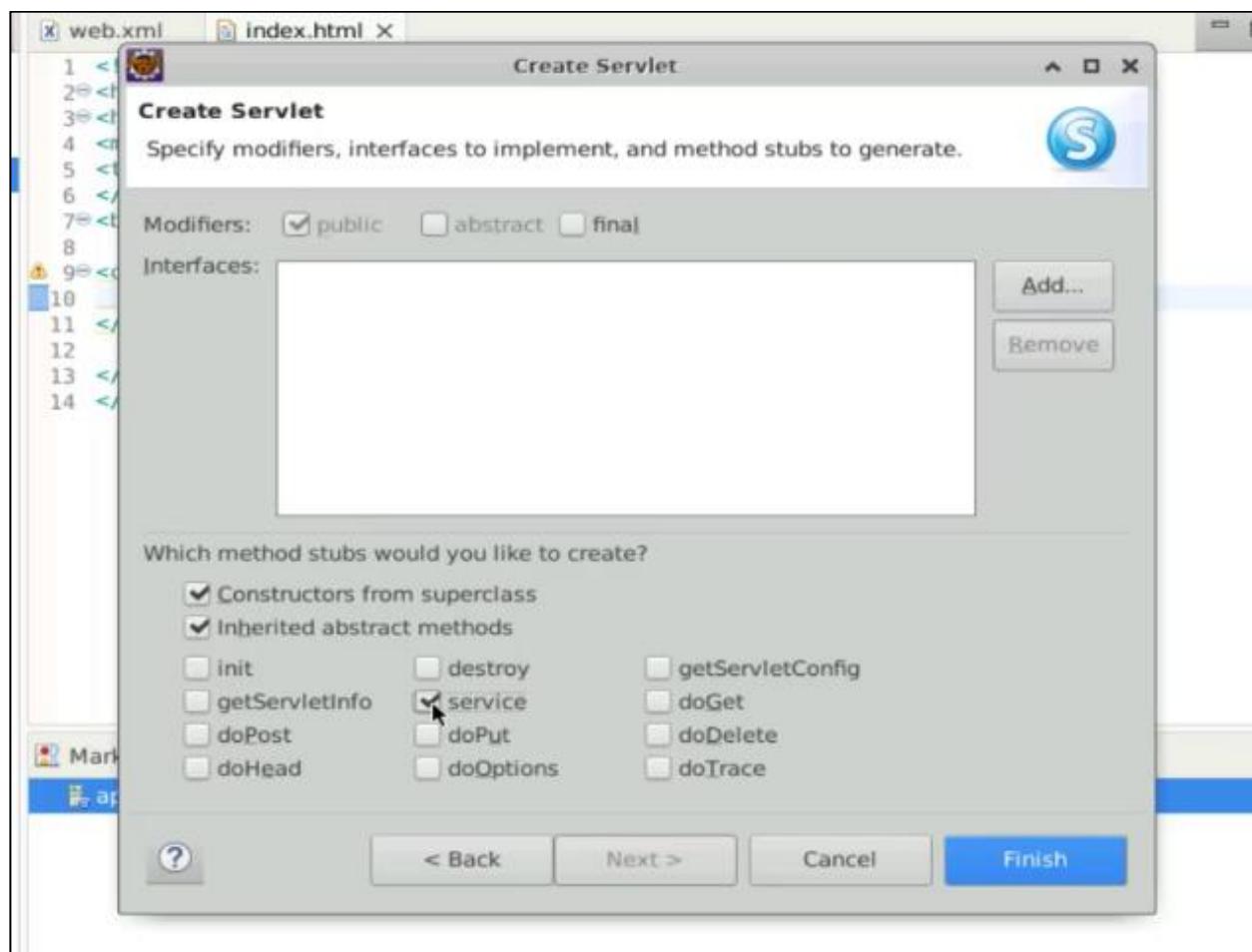
4.2 Enter the package name as **com.estore.controller**, class name as **HelloServlet**, and click on **Next**



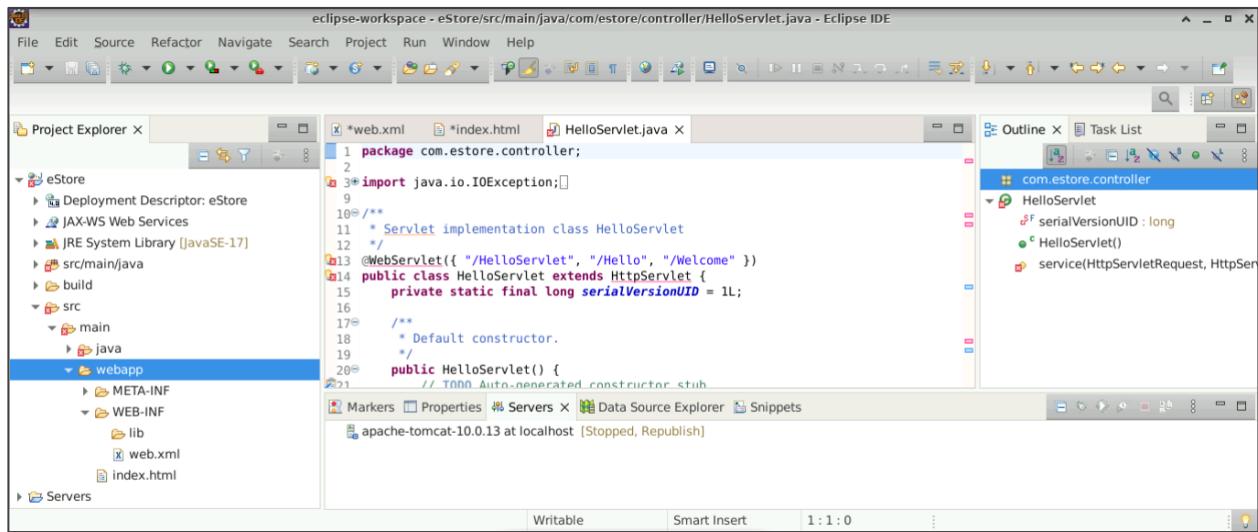
4.3 Click on **Add**, and add other URL mappings, like **/Hello** and **/Welcome**. Click on **Next**



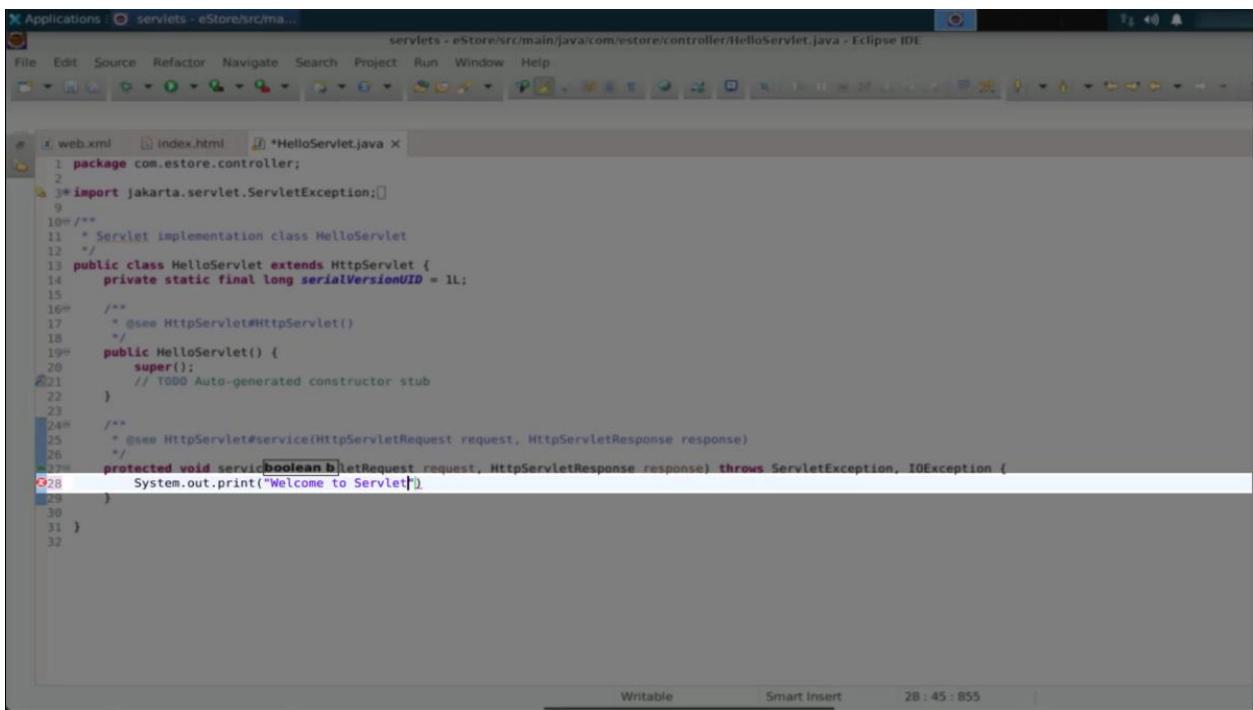
4.4 Select **service**, as service is the method that gets created whenever you send a request, and then click on **Finish**



In this case, the Servlet created is a child of the `HttpServlet`. A Servlet contains a request and a response.



4.5 In the service method, use the **System.out.print()** statement to display the message **Welcome to Servlet** (line 28)

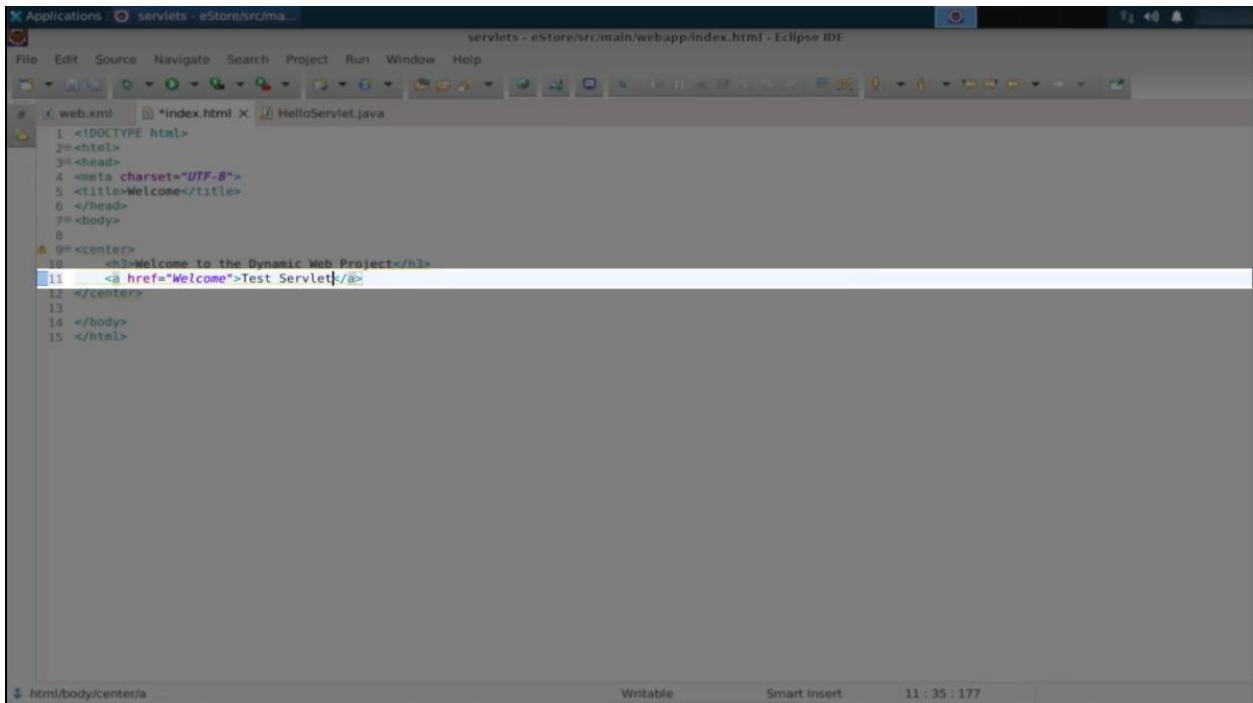


4.6 Go to the **web.xml** file, and you can see a servlet-name created as **HelloServlet**



```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="https://jakarta.ee/xml/ns/jakartae" xmlns:web="http://xmlns.jcp.org/xml/ns/javaee"
3   <display-name>eStore</display-name>
4   <welcome-file-list>
5     <welcome-file>index.html</welcome-file>
6   </welcome-file-list>
7
8   <servlet>
9     <description></description>
10    <display-name>HelloServlet</display-name>
11    <servlet-name>HelloServlet</servlet-name>
12    <servlet-class>com.estore.controller.HelloServlet</servlet-class>
13  </servlet>
14
15  <servlet-mapping>
16    <servlet-name>HelloServlet</servlet-name>
17    <url-pattern>/Hello</url-pattern>
18    <url-pattern>/Welcome</url-pattern>
19  </servlet-mapping>
20
21 </web-app>
```

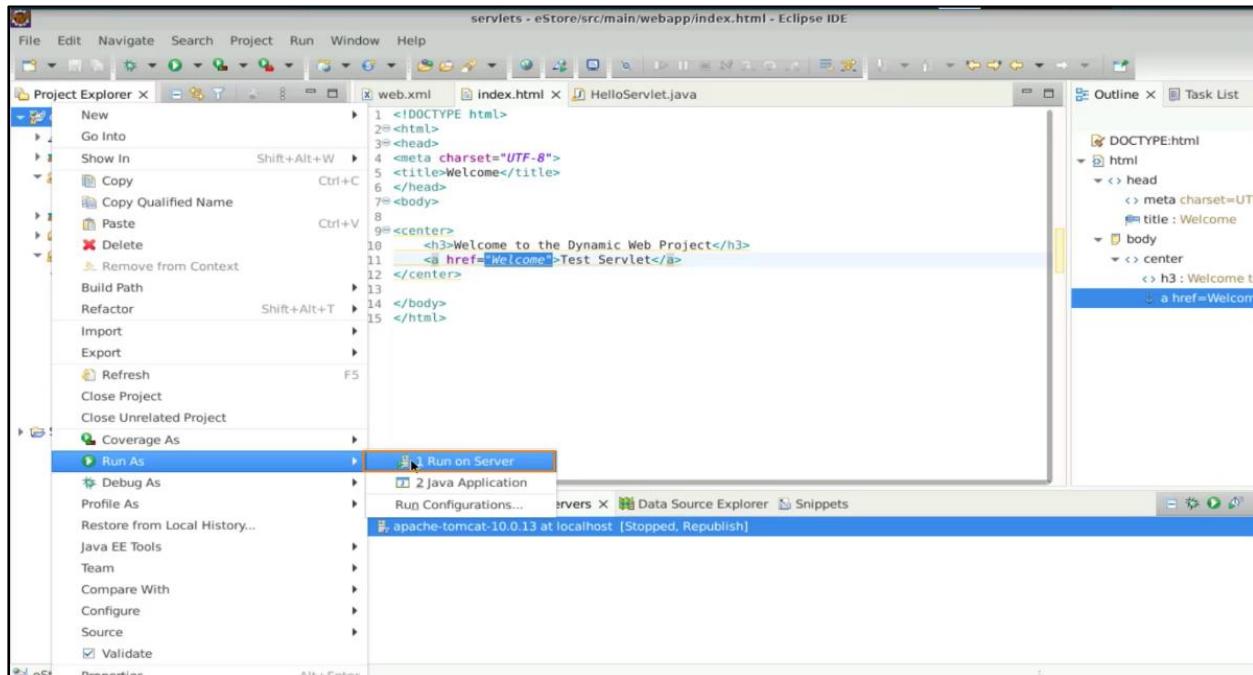
4.7 Go to the **index.html** file and create a hyperlink as **Welcome** (line 11). This is one of the URL patterns you gave while creating the Servlet.



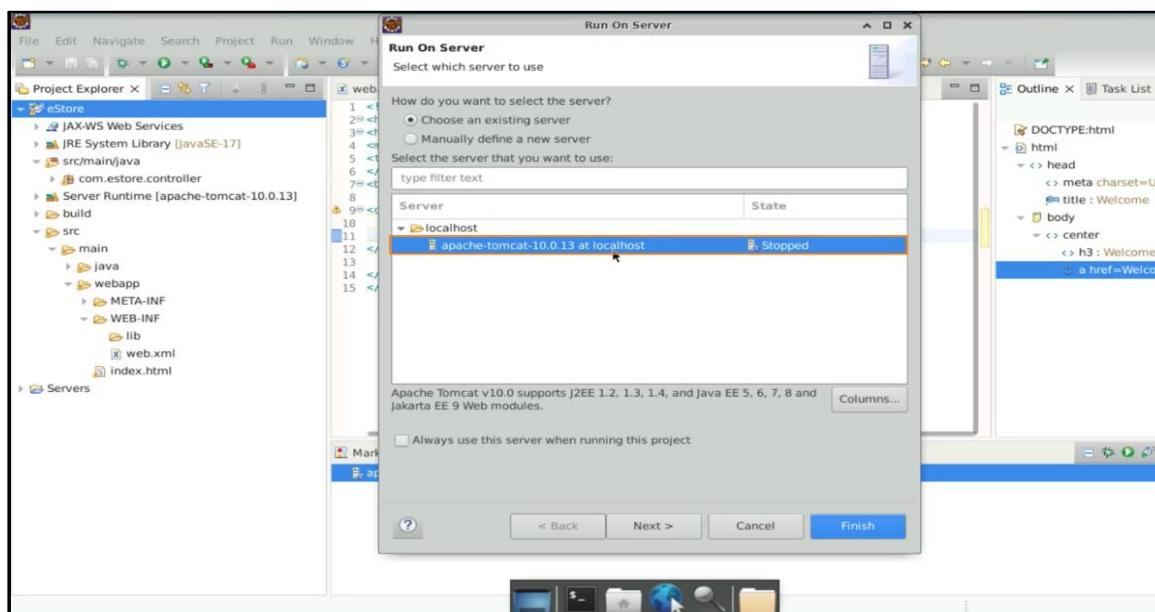
```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <meta charset="UTF-8">
5     <title>Welcome</title>
6   </head>
7   <body>
8
9     <center>
10       <h3>Welcome to the Dynamic Web Project</h3>
11       <a href="Welcome">Test Servlet</a>
12     </center>
13
14   </body>
15 </html>
```

Step 5: Run the project and handle the error

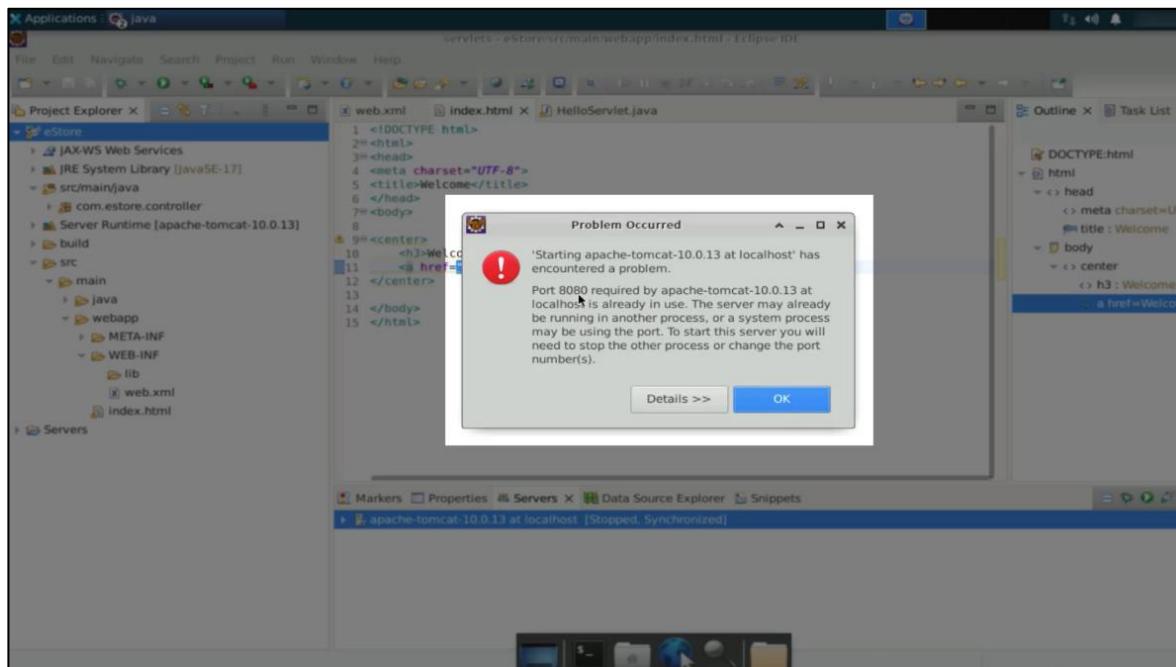
5.1 Go to the **index.html** file and run the project. Right-click on **eStore**, select **Run As**, and then click on **Run on Server**



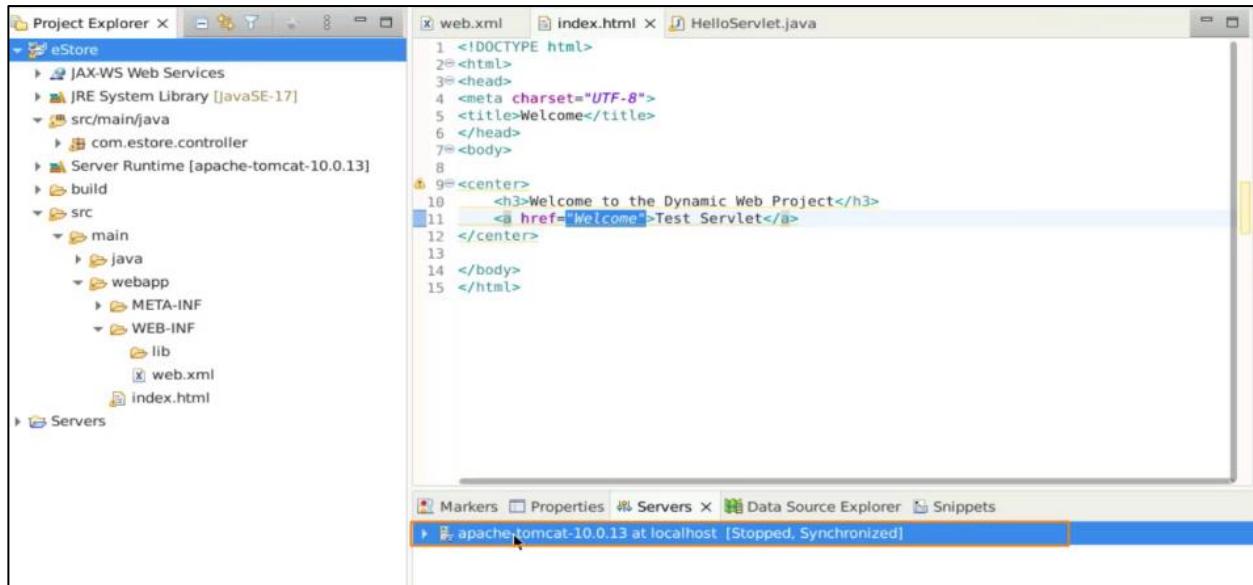
5.2 Select the server **apache-tomcat-10.0.13 at localhost**, and then click on **Finish**



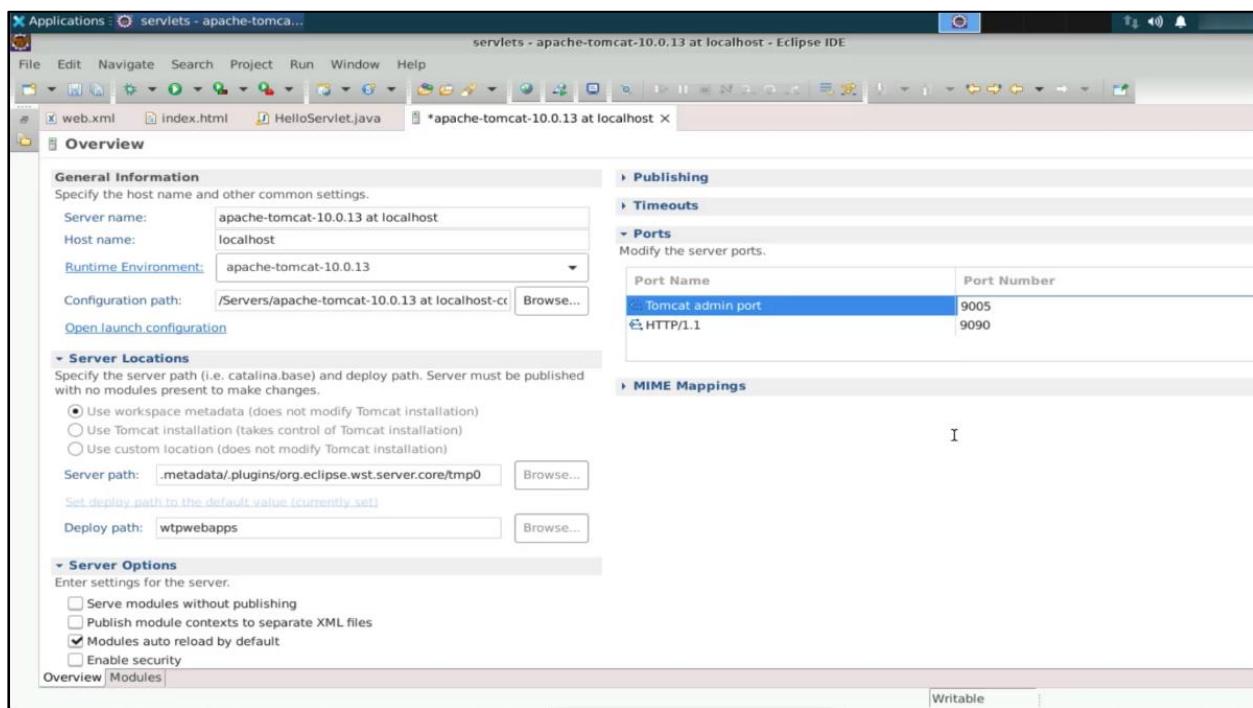
The output has the error stating that port **8080** is already in use.



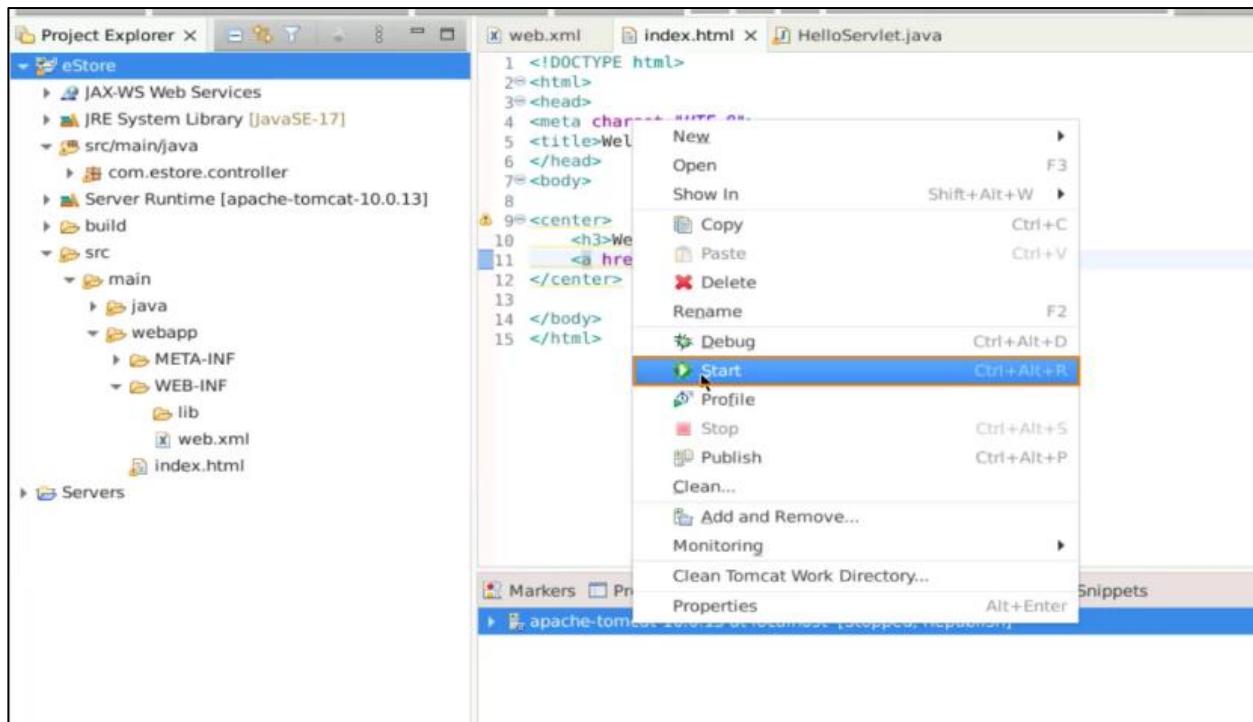
5.3 Open the tomcat file configuration file



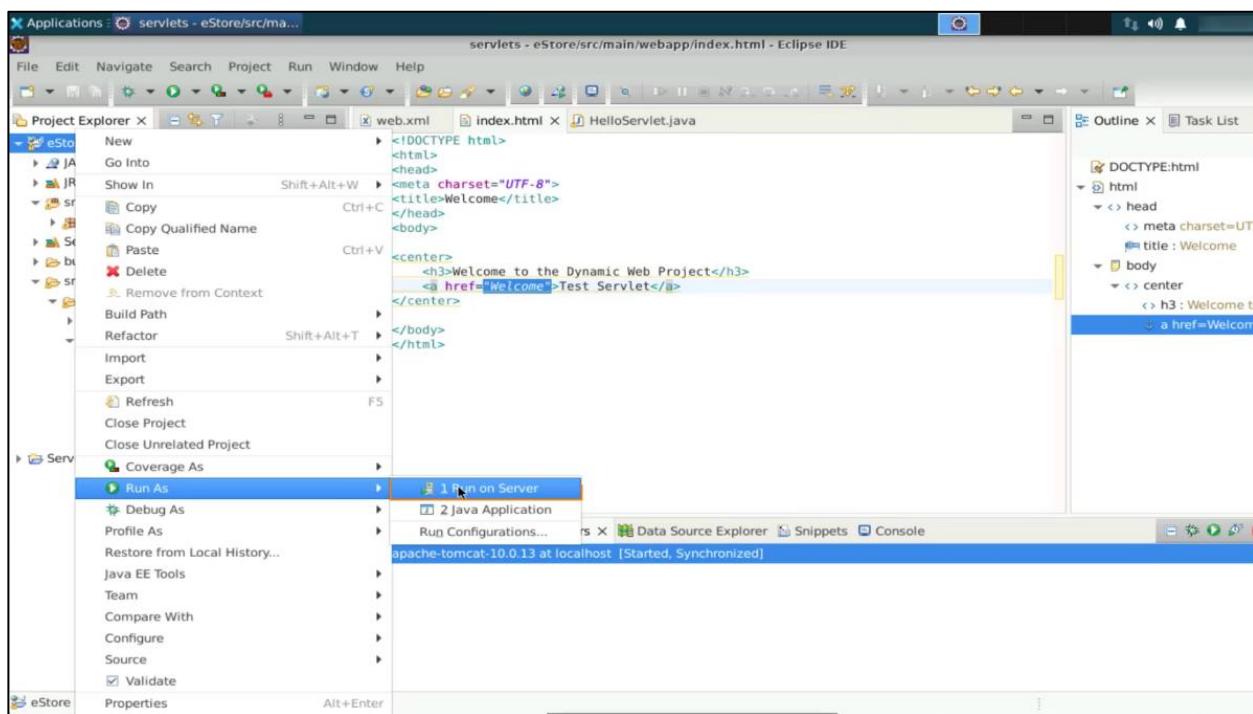
5.4 Change the port number from 8080 to 9090 and the admin port to 9005



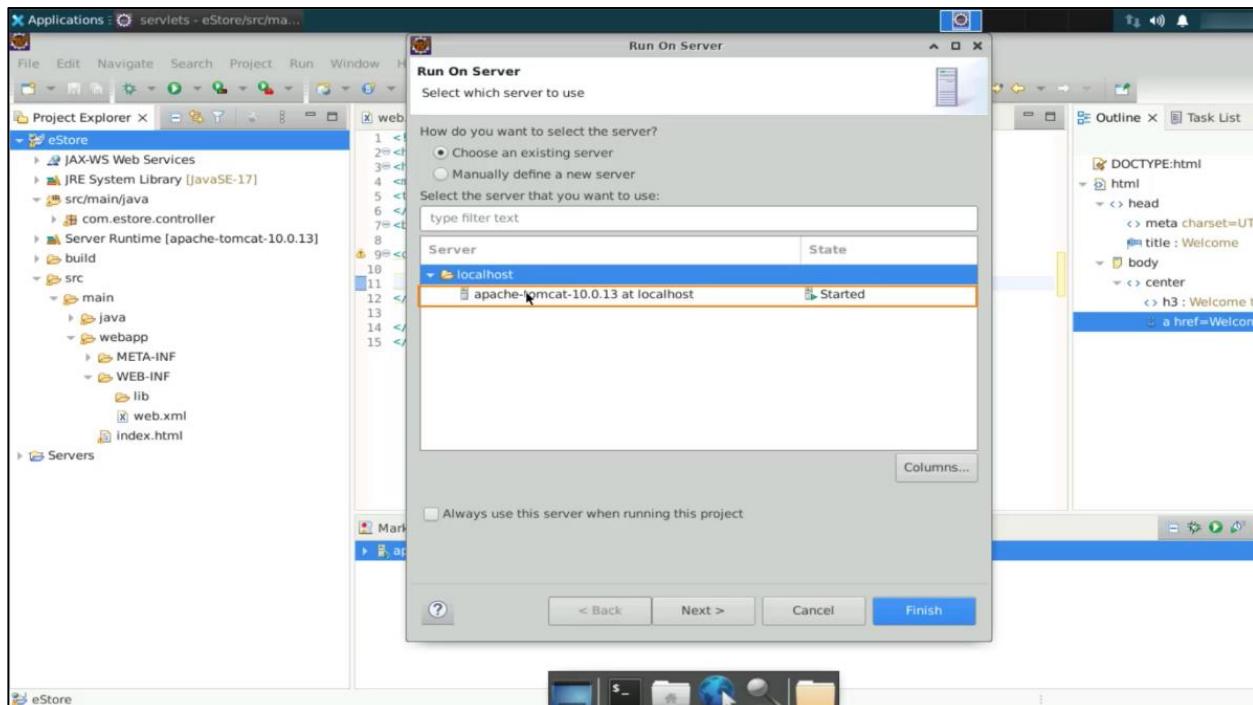
5.5 Save the file, right-click on the screen and select Start



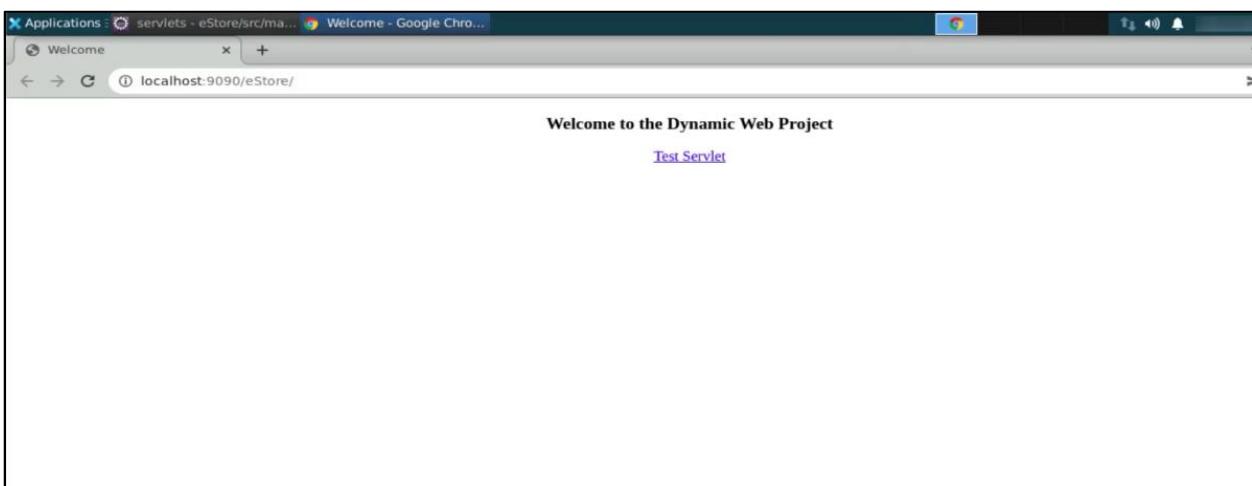
5.6 Now, repeat step 5.1



5.7 Repeat step 5.2



The output displayed will be, **Welcome to the Dynamic Web Project.**



You can see that the program is executed on port number **9090** since **8080** was blocked.

5.8 Now, click on the link **Test Servlet**

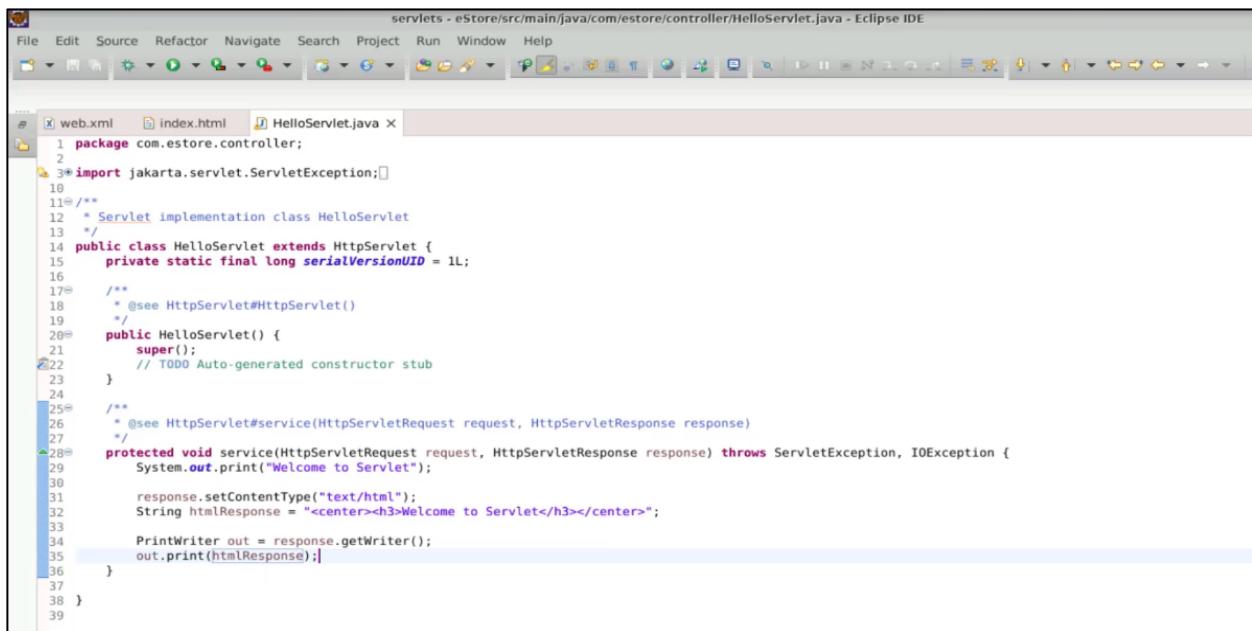


You can now observe that the URL pattern is changed to **Welcome**.



Step 6: Make the Servlet work with a response

6.1 Go to the **Servlet.java** file and create the responses from the Servlet. Set the content type for a response using the **setContentType()** method and add the type as **text** or **HTML**. Add a **PrintWriter** and a reference variable for the response (lines 31 to 35)

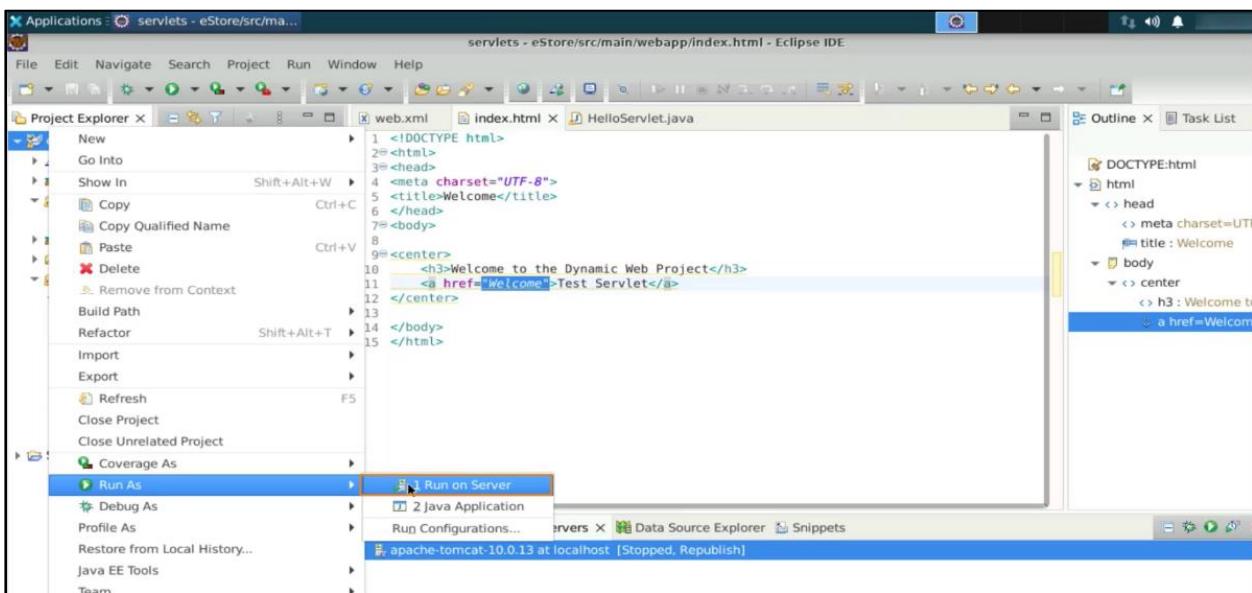


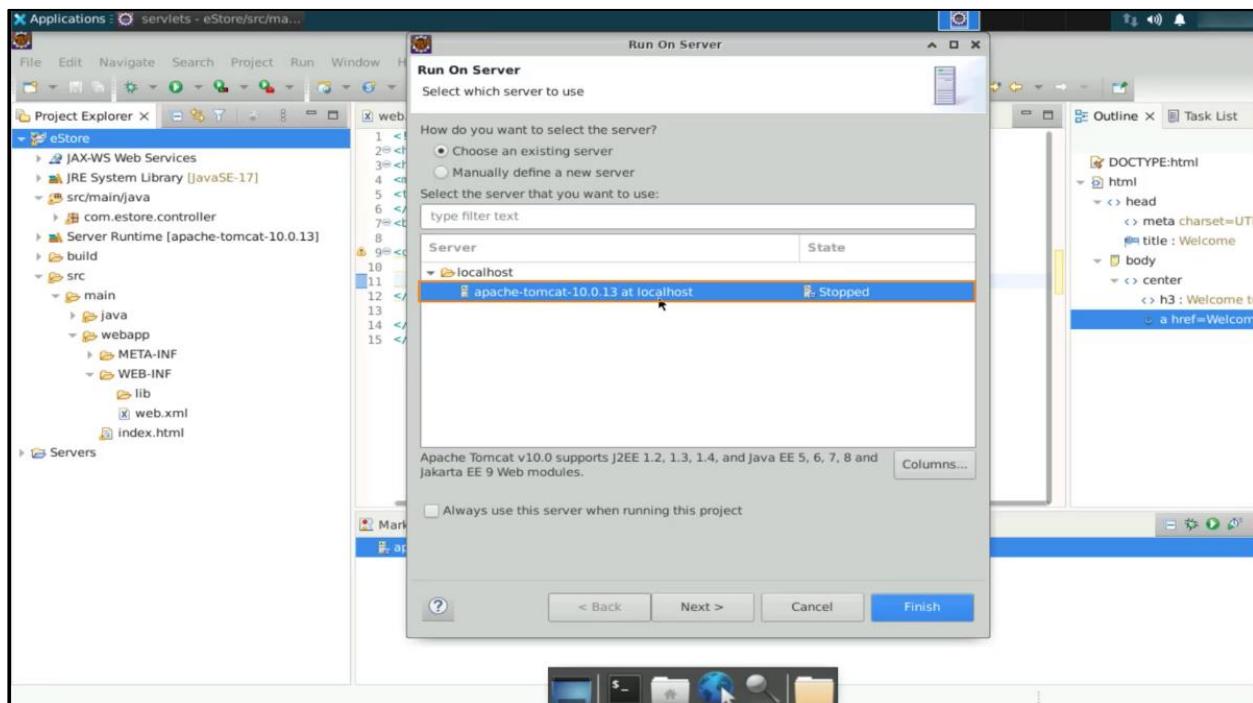
```

servlets - eStore/src/main/java/com/estore/controller/HelloServlet.java - Eclipse IDE
File Edit Source Refactor Navigate Search Project Run Window Help
web.xml index.html HelloServlet.java
1 package com.estore.controller;
2
3 import jakarta.servlet.ServletException;
4
5 /**
6  * Servlet implementation class HelloServlet
7  */
8 public class HelloServlet extends HttpServlet {
9     private static final long serialVersionUID = 1L;
10
11    /**
12     * @see HttpServlet#HttpServlet()
13     */
14    public HelloServlet() {
15        super();
16        // TODO Auto-generated constructor stub
17    }
18
19    /**
20     * @see HttpServlet#service(HttpServletRequest request, HttpServletResponse response)
21     */
22    protected void service(HttpServletRequest request, HttpServletResponse response) throws ServletException, IOException {
23        System.out.print("Welcome to Servlet");
24
25        response.setContentType("text/html");
26        String htmlResponse = "<center><h3>Welcome to Servlet</h3></center>";
27
28        PrintWriter out = response.getWriter();
29        out.print(htmlResponse);
30    }
31
32 }
33
34
35
36
37
38 }
39

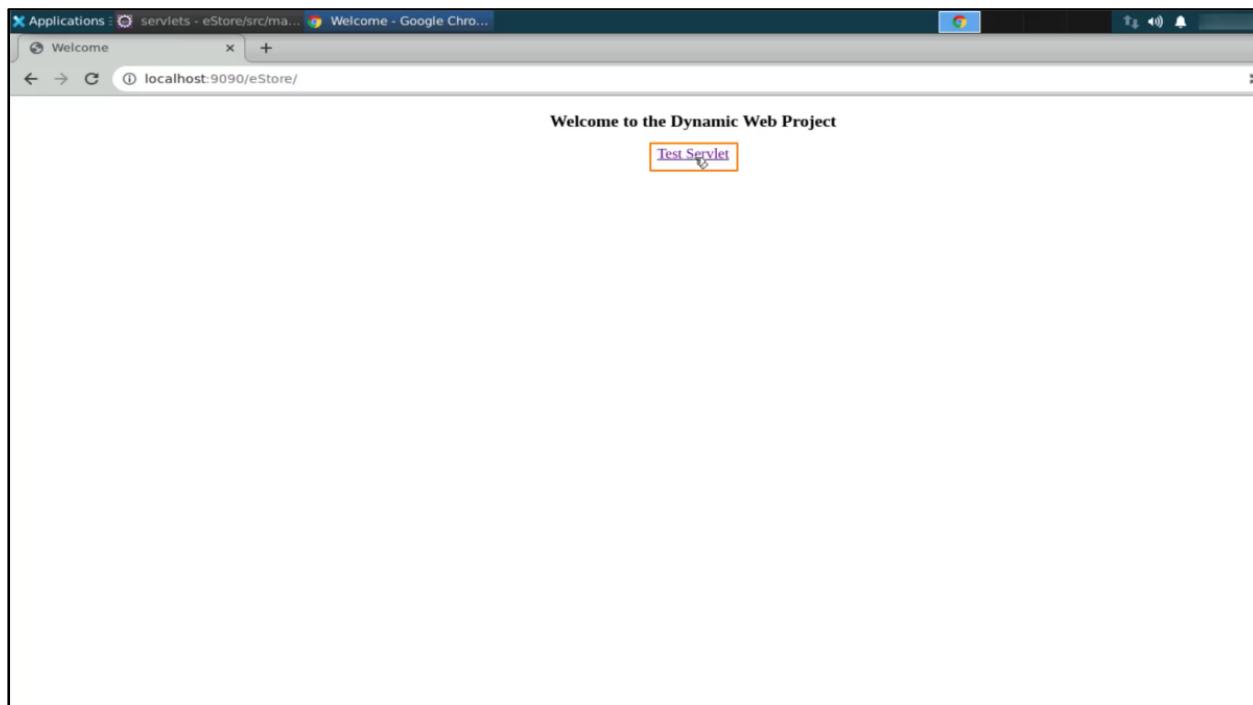
```

6.2 Repeat steps 5.1 and 5.2

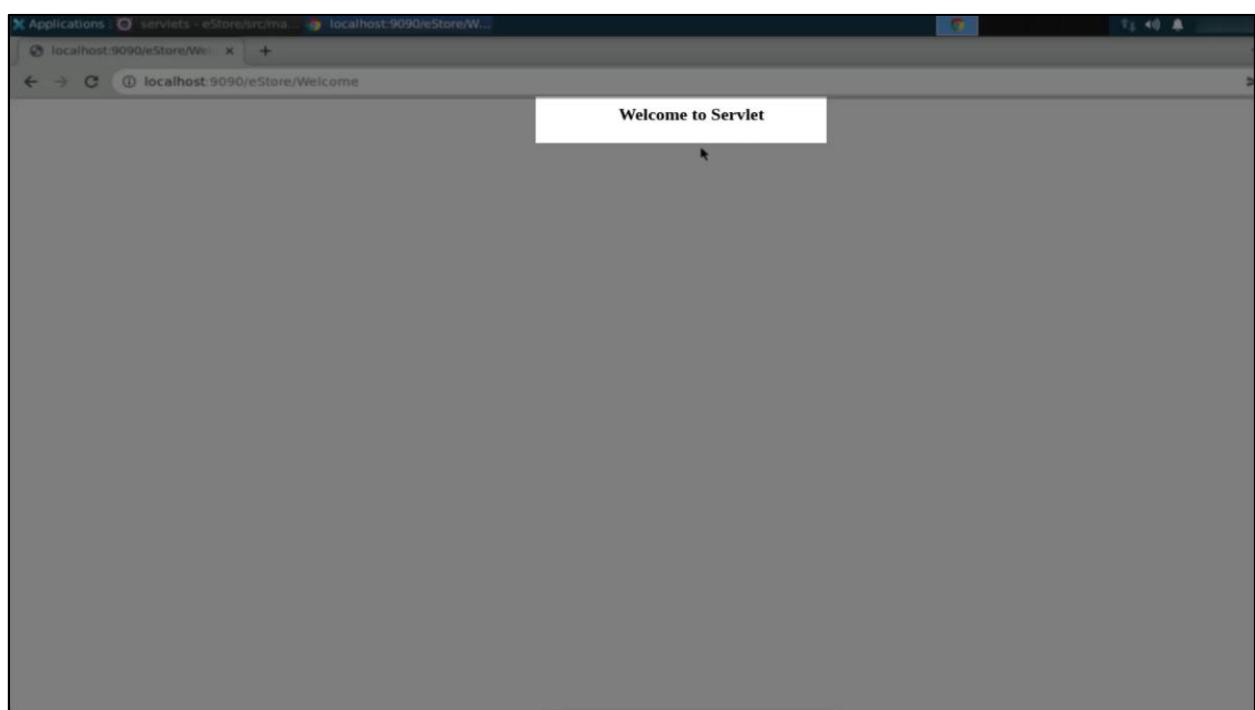




6.3 Go to the browser, open **eStore localhost**, and then click on the link **Test Servlet**



The output can be seen as a response as **Welcome to Servlet.**



Following these steps, you create a dynamic web project using Eclipse IDE and make the Servlet work with responses.