

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

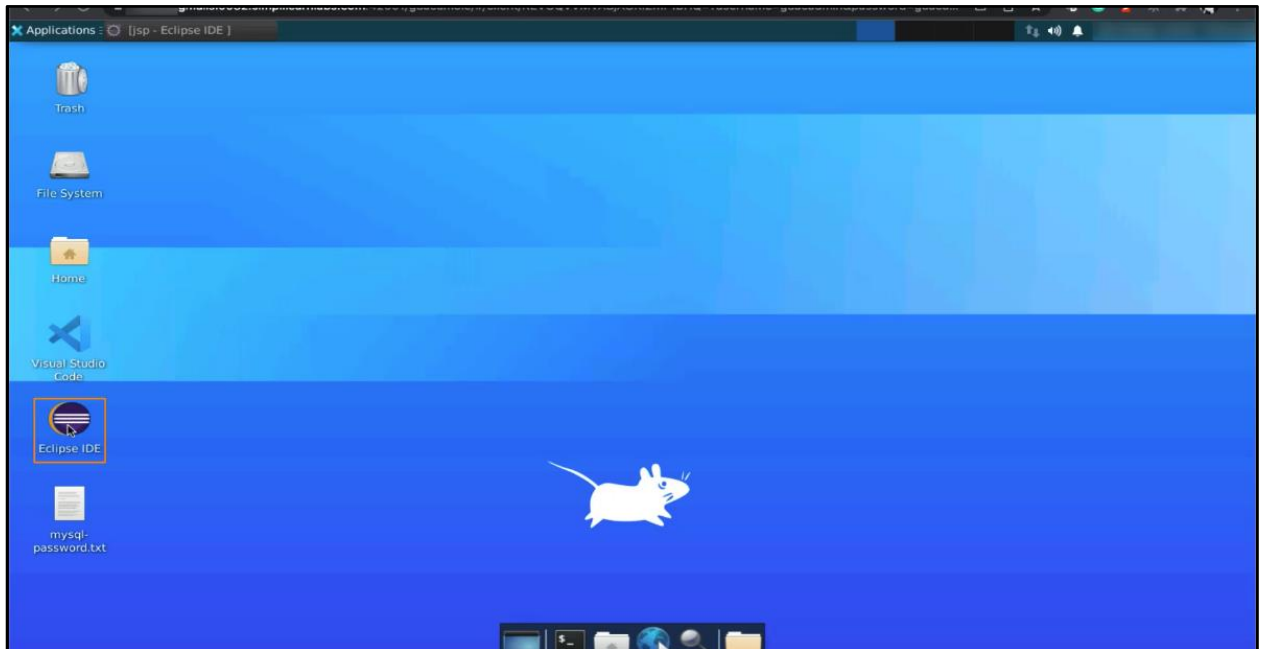
Prerequisites: None

Steps to be followed:

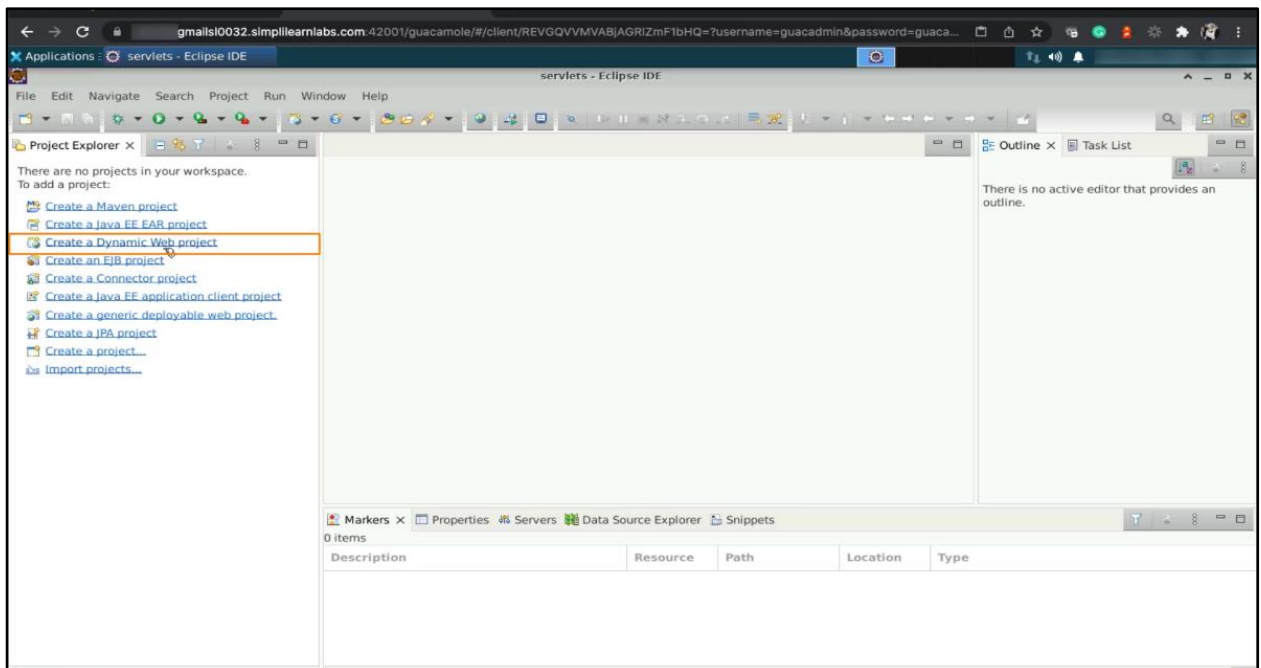
1. Create a new project
2. Create a server
3. Create a new HTML file
4. Create a Servlet
5. Run the project and handle the error
6. Make the Servlet work with a response

Step 1: Create a new project

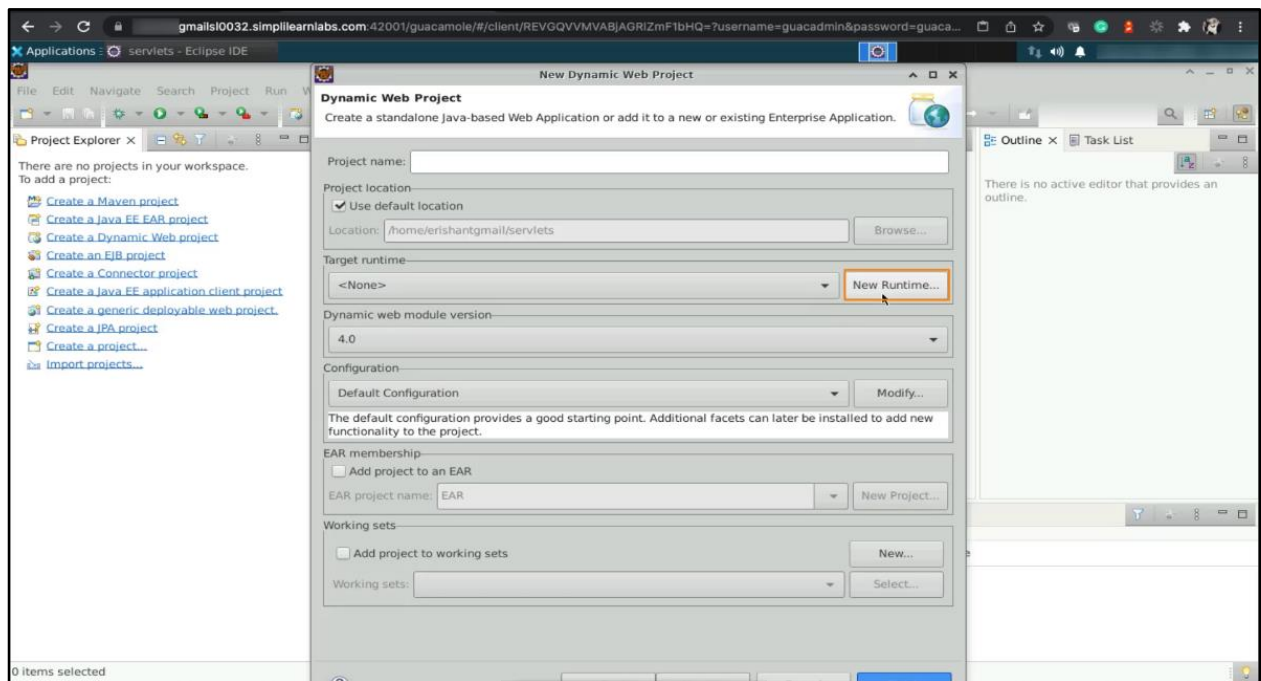
1.1 Open Eclipse IDE



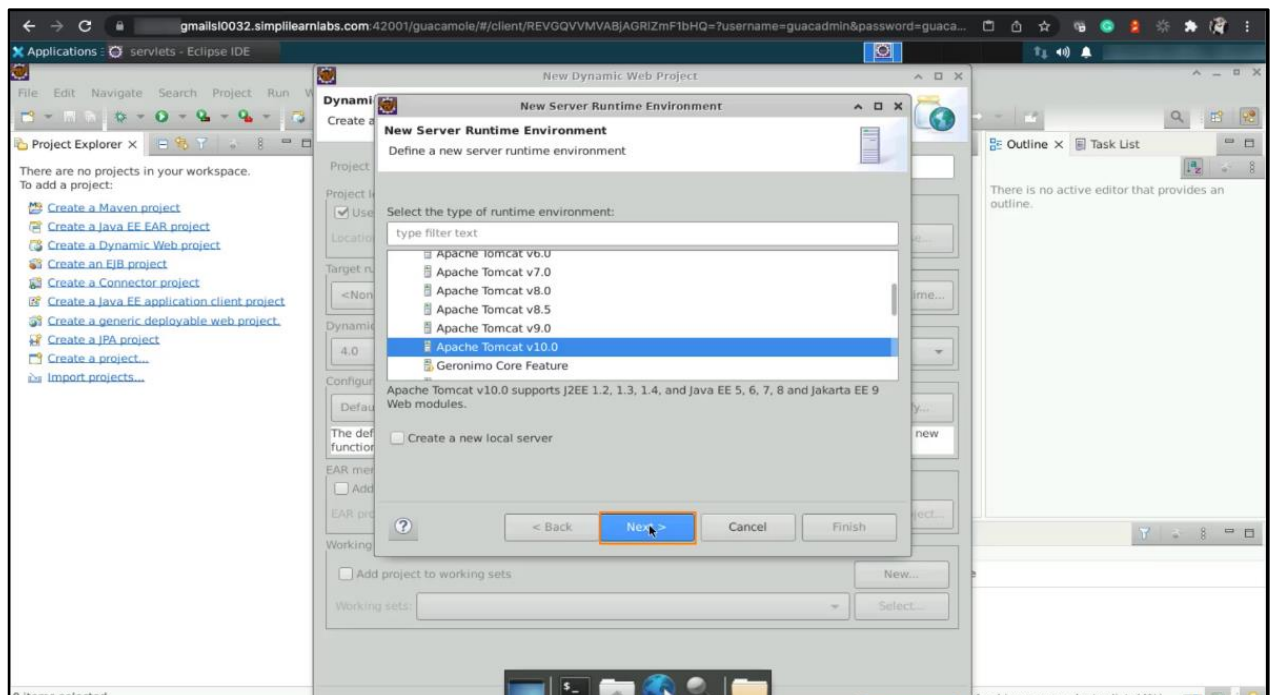
1.2 Click on the **Create a Dynamic Web Project** option



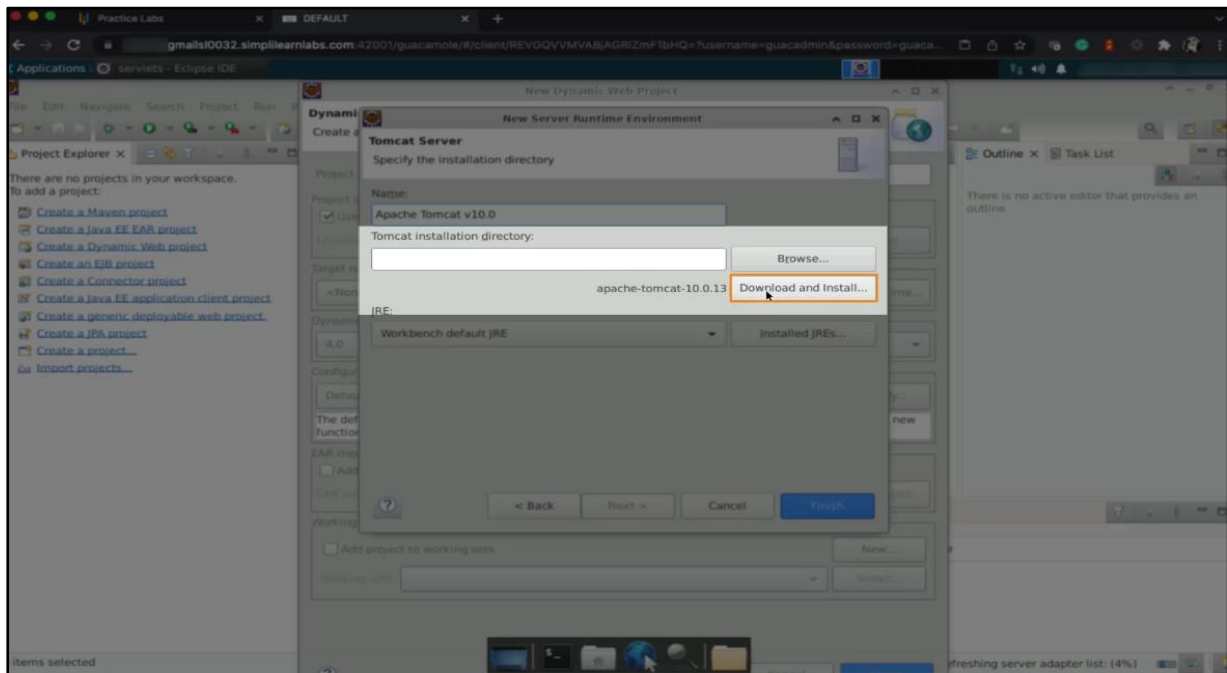
1.3 Specify the **Target Runtime**. Since it is empty, click on the **New Runtime** option



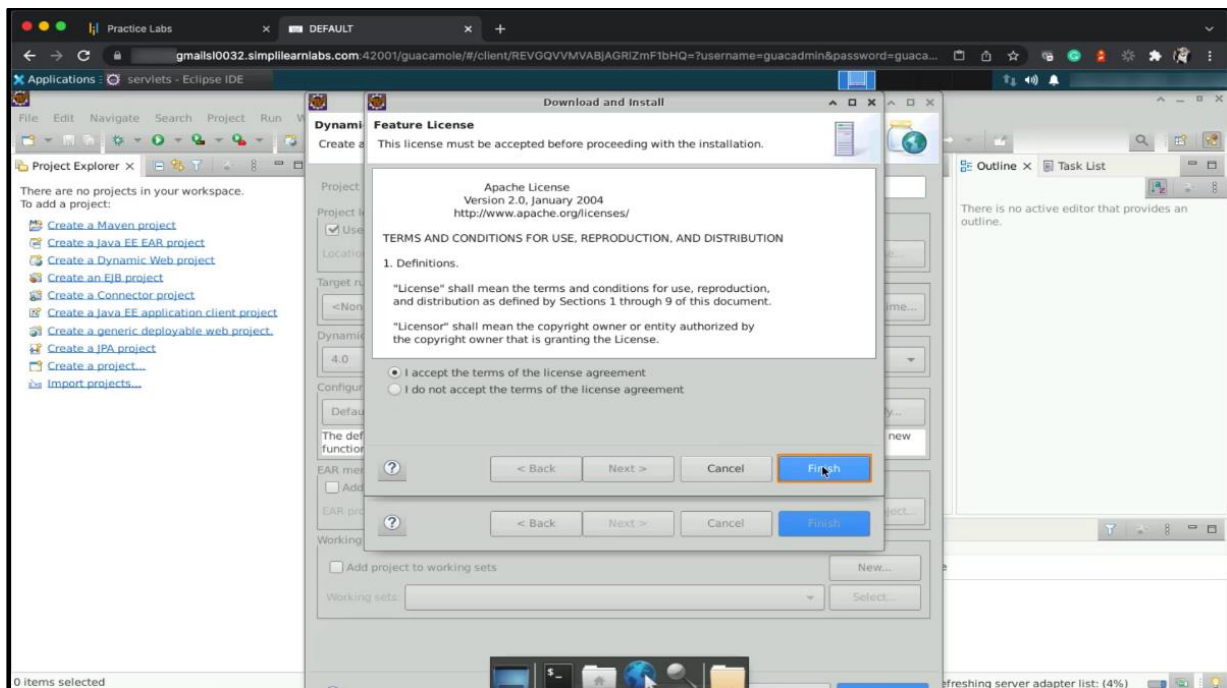
1.4 Select the **Apache Tomcat version v10.0** and click on **Next**



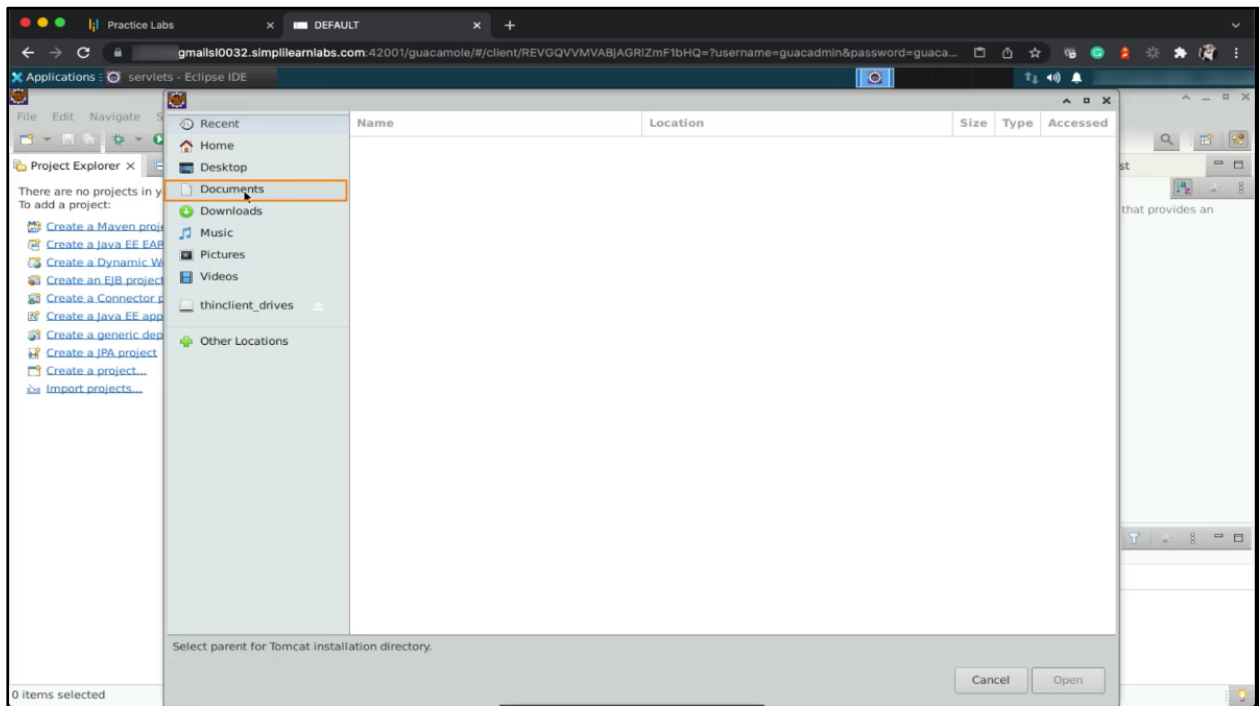
1.5 Click on the **Download and Install** button



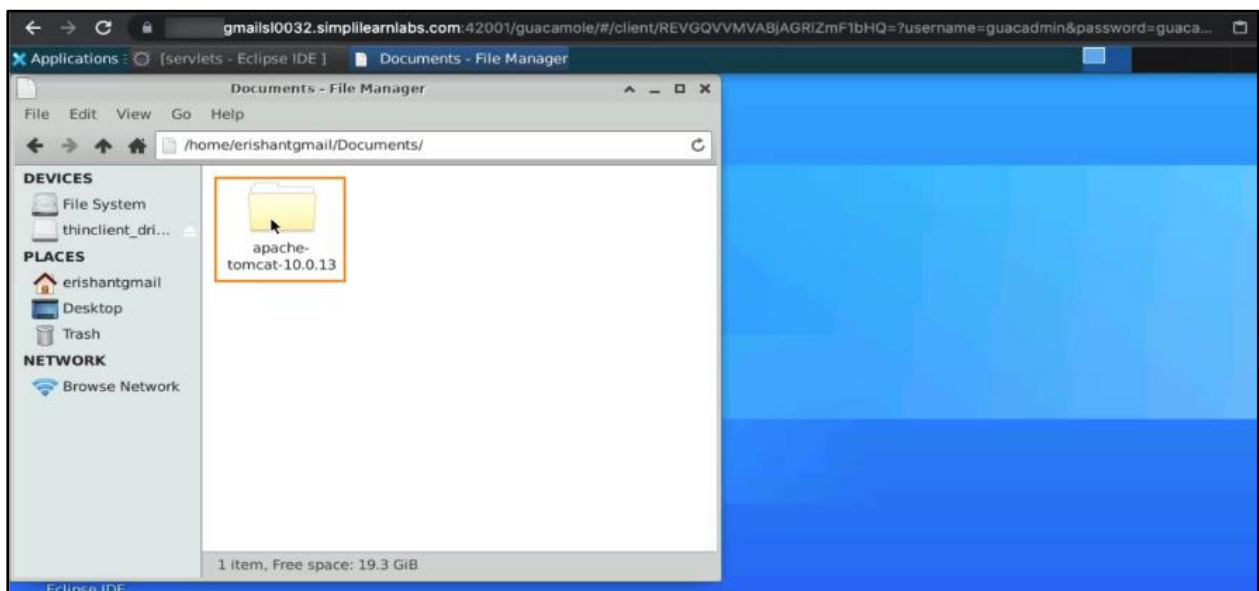
1.6 Accept the terms and conditions, and then click on **Finish**



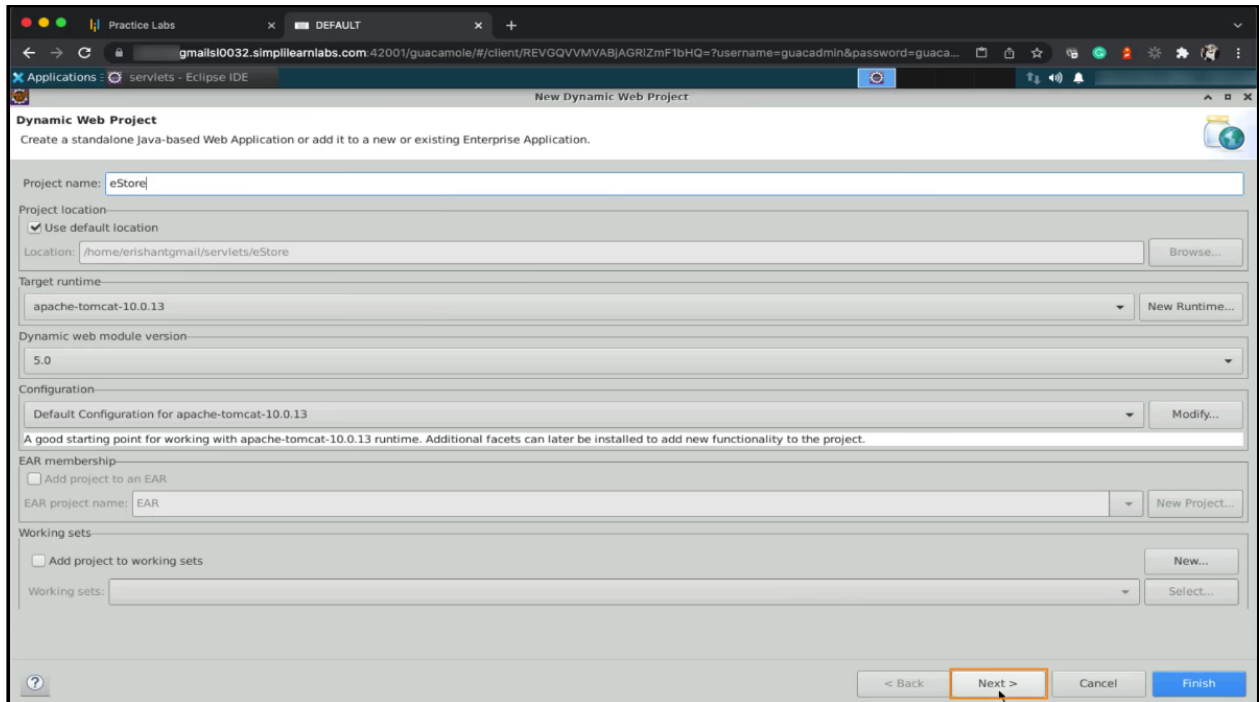
1.7 Select **Documents**, and then click on **Open**



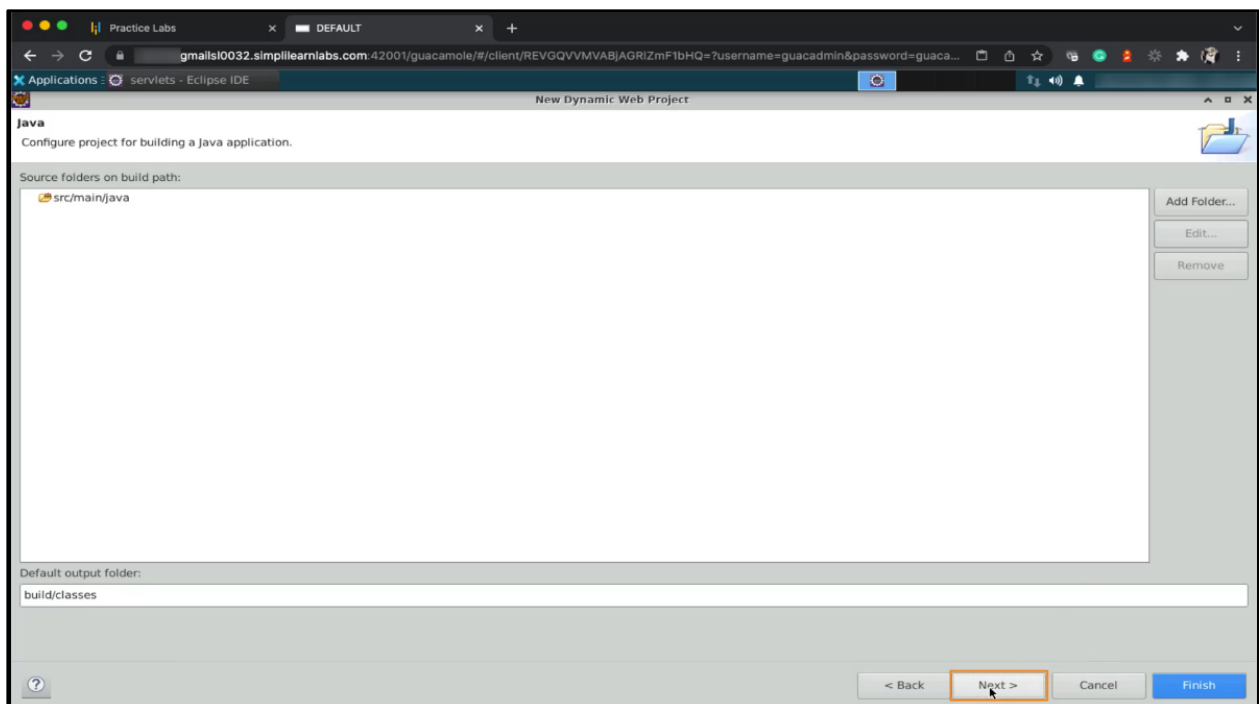
1.8 To check if Tomcat is installed, go to the **Documents** folder, and you can check if the **apache-tomcat-10.0.13** file is available



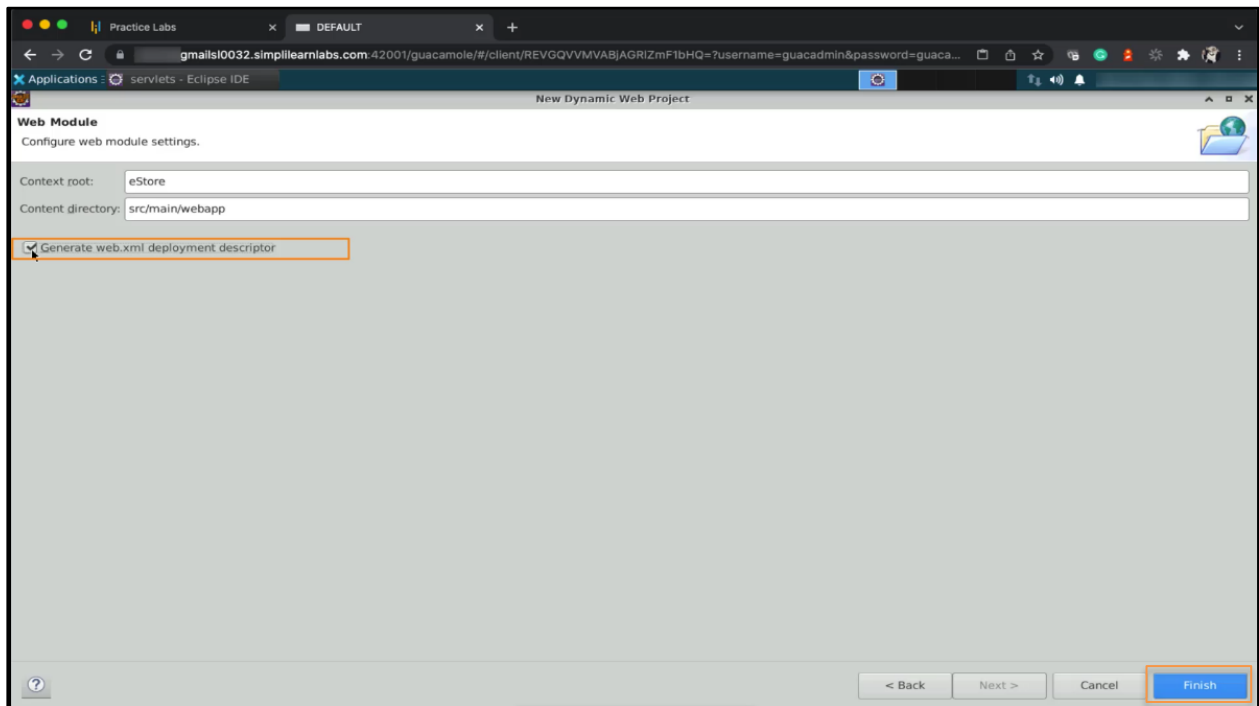
1.9 Go back to **Eclipse IDE** and fill in the details, like the project name. Enter the name as **eStore** and click on **Next**



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



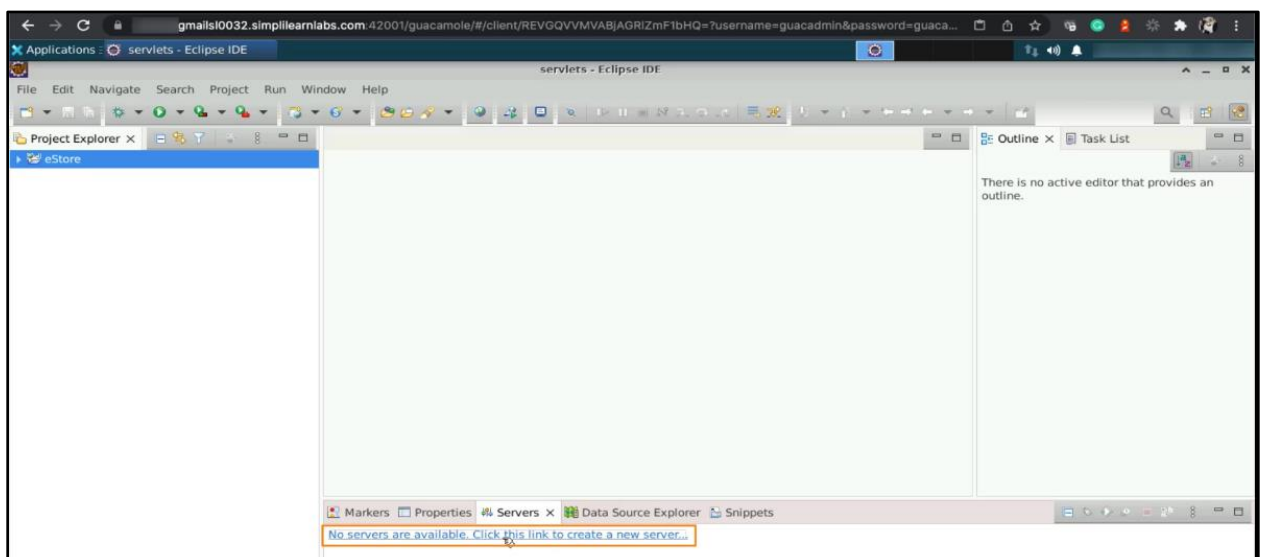
1.10 Select the option **Generate web.xml deployment descriptor** and then click on **Finish**



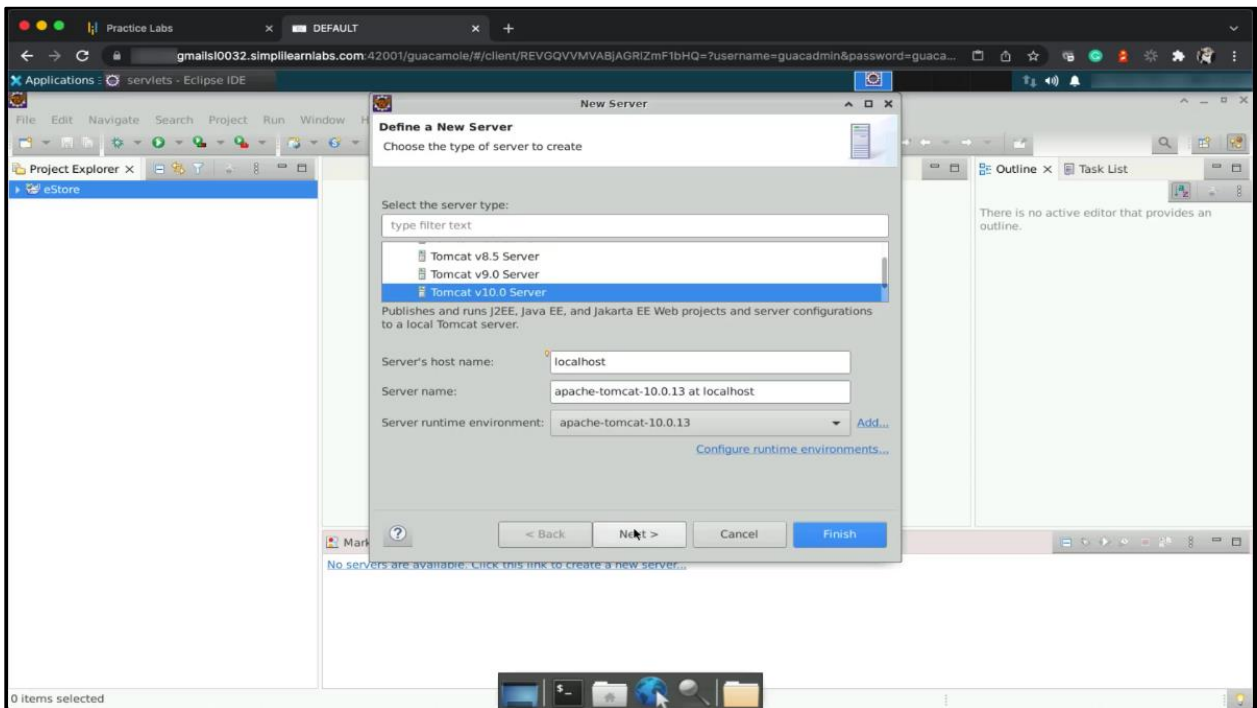
The dynamic web project is now created.

Step 2: Create a server

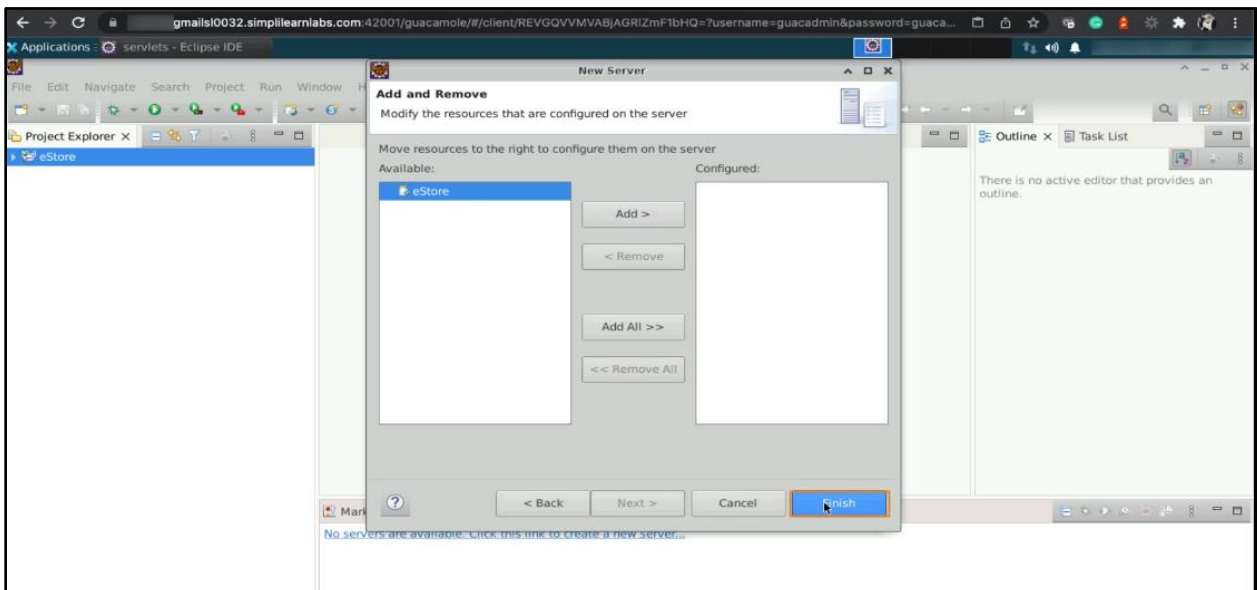
2.1 Now, go to the **Server** tab, and click on the link to **create a new server**



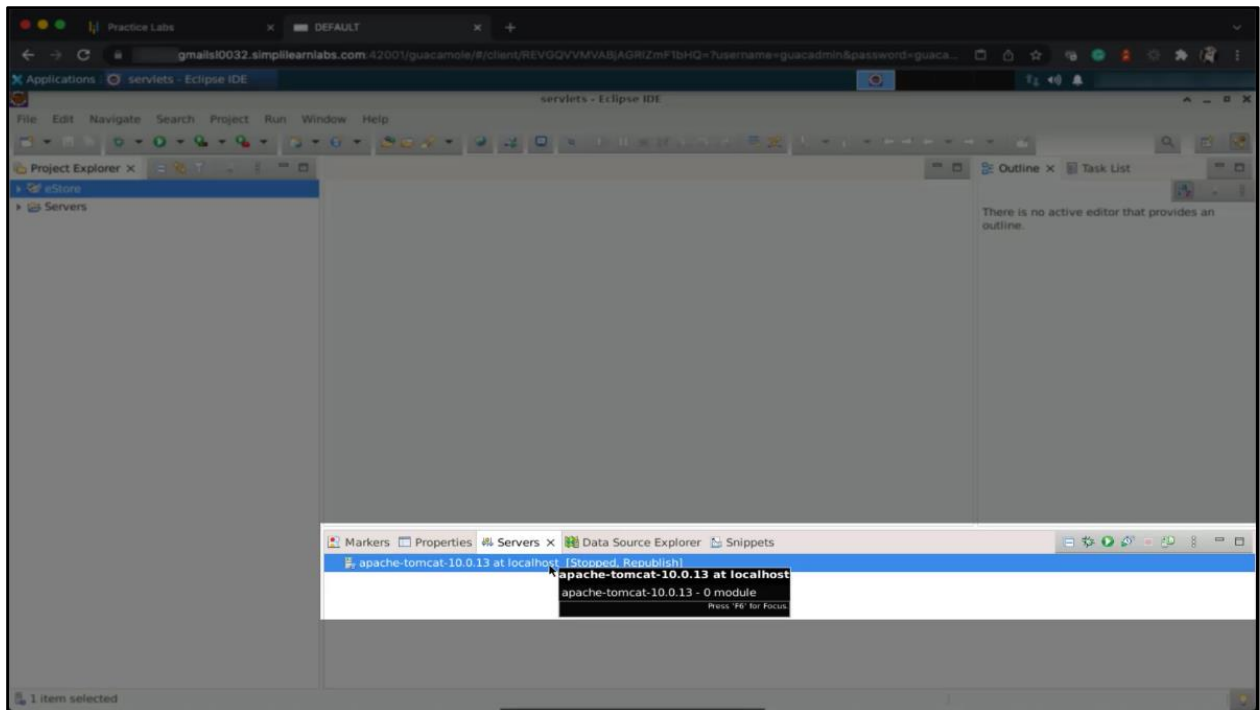
2.2 Select the **Apache Tomcat v.10.0 Server** and click on **Next**



2.3 Select the **eStore** project and click on **Finish**



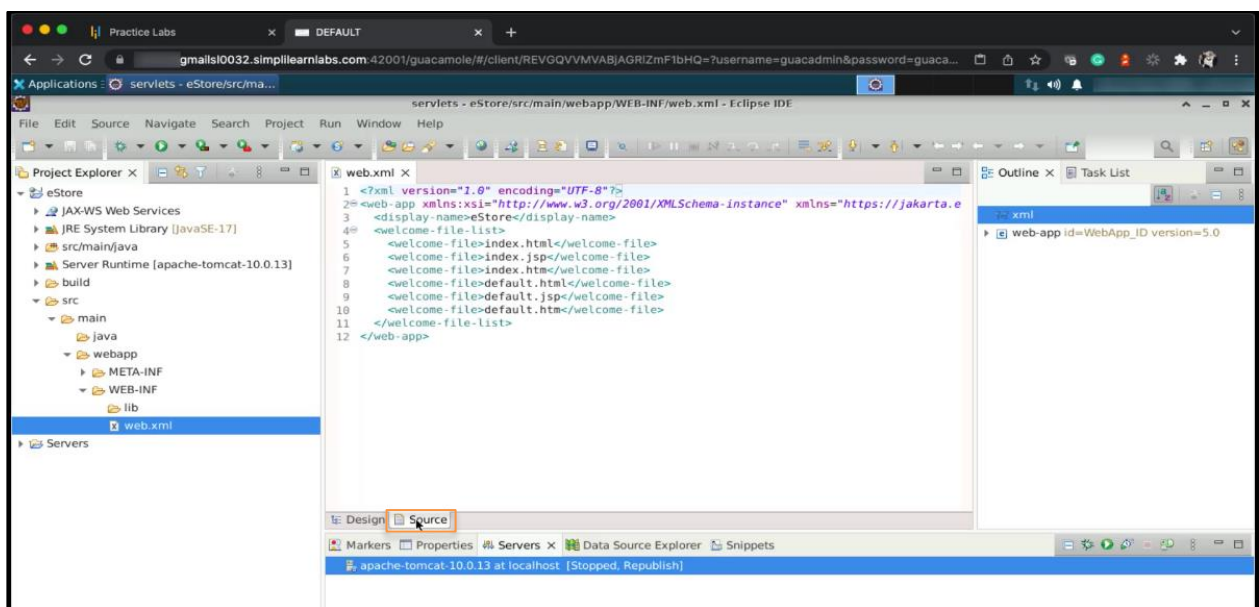
The server **apache-tomcat-10.0.13 at localhost** has been linked.



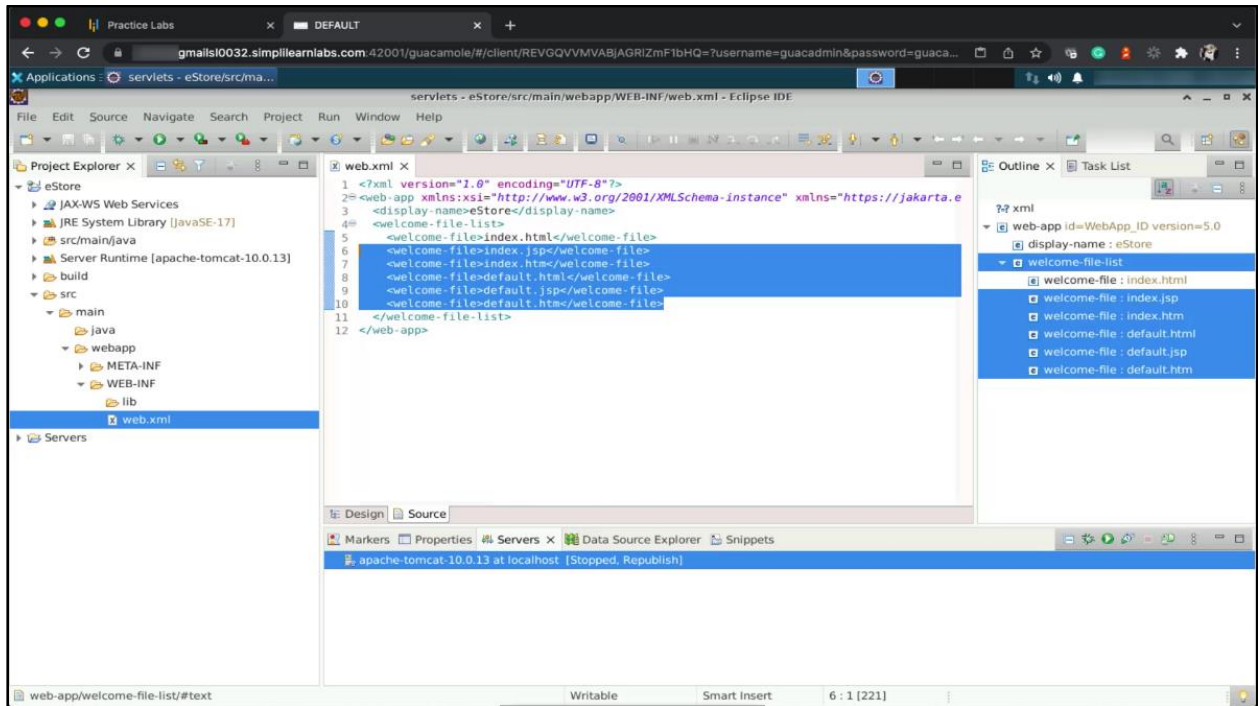
This is how you can configure the server for your project.

Step 3: Create a new HTML file

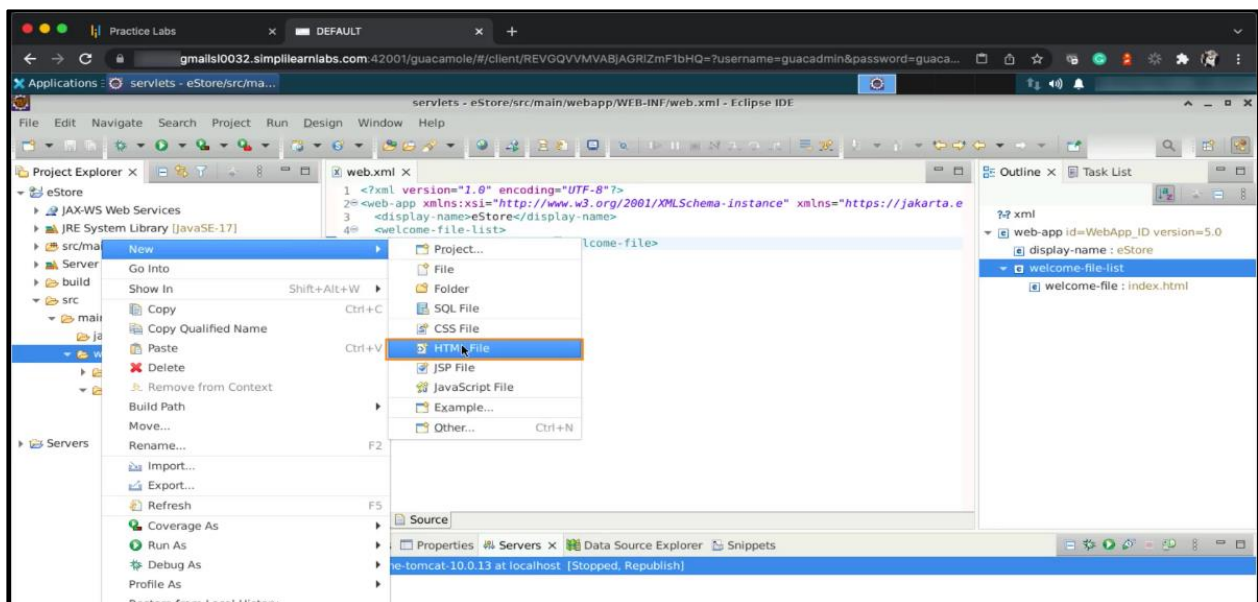
3.1 Open the **web.xml** file from **eStore -> src -> webapp -> WEB-INF -> web.xml -> Source**



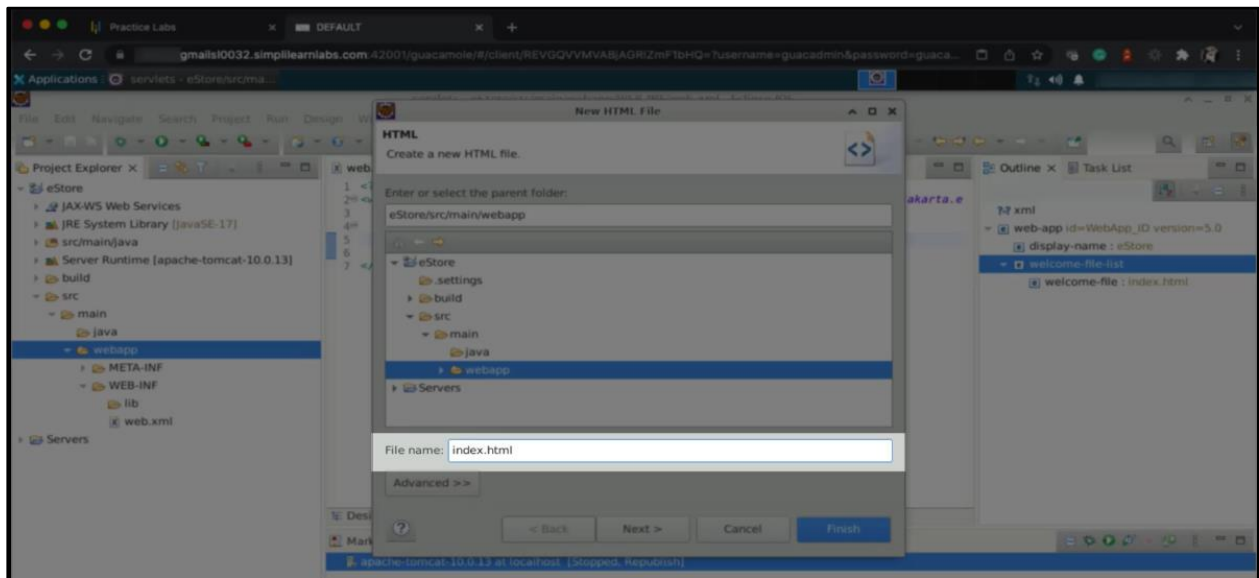
3.2 Delete all the welcome files (from lines 6 to 10)



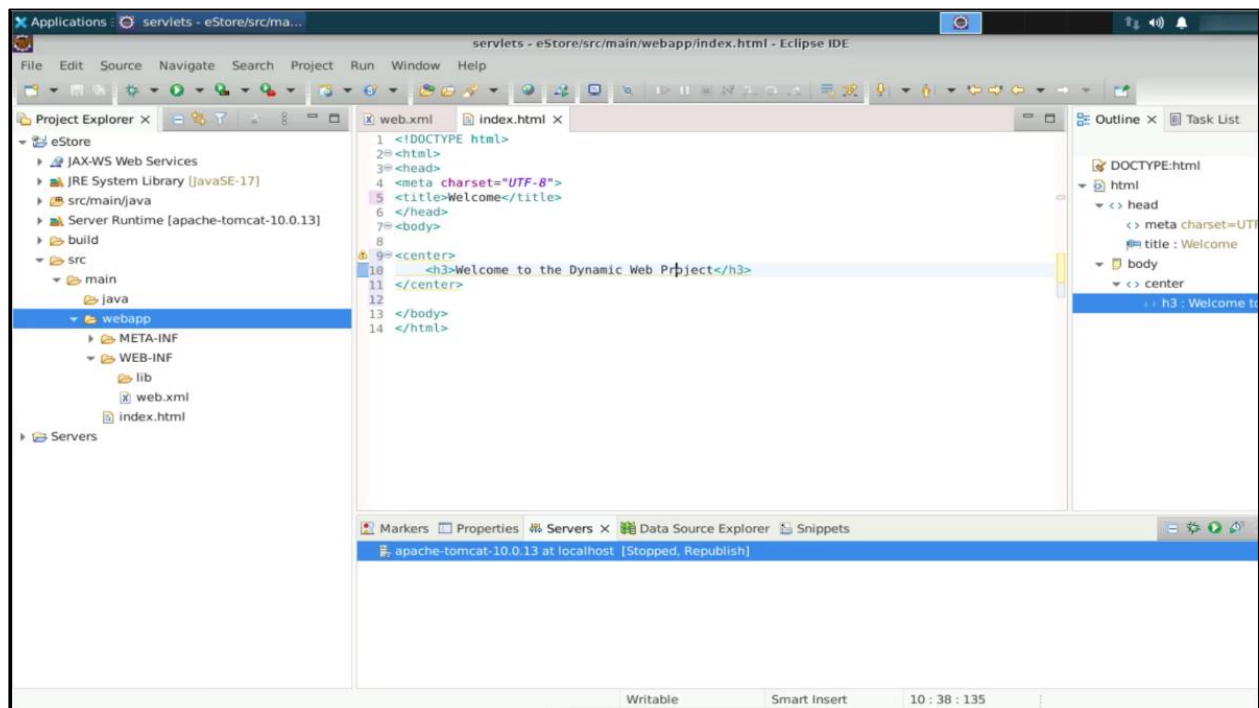
3.3 In the **webapp** folder, create a new HTML file. Right-click on **webapp**, select **New**, and click on **HTML File**.



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

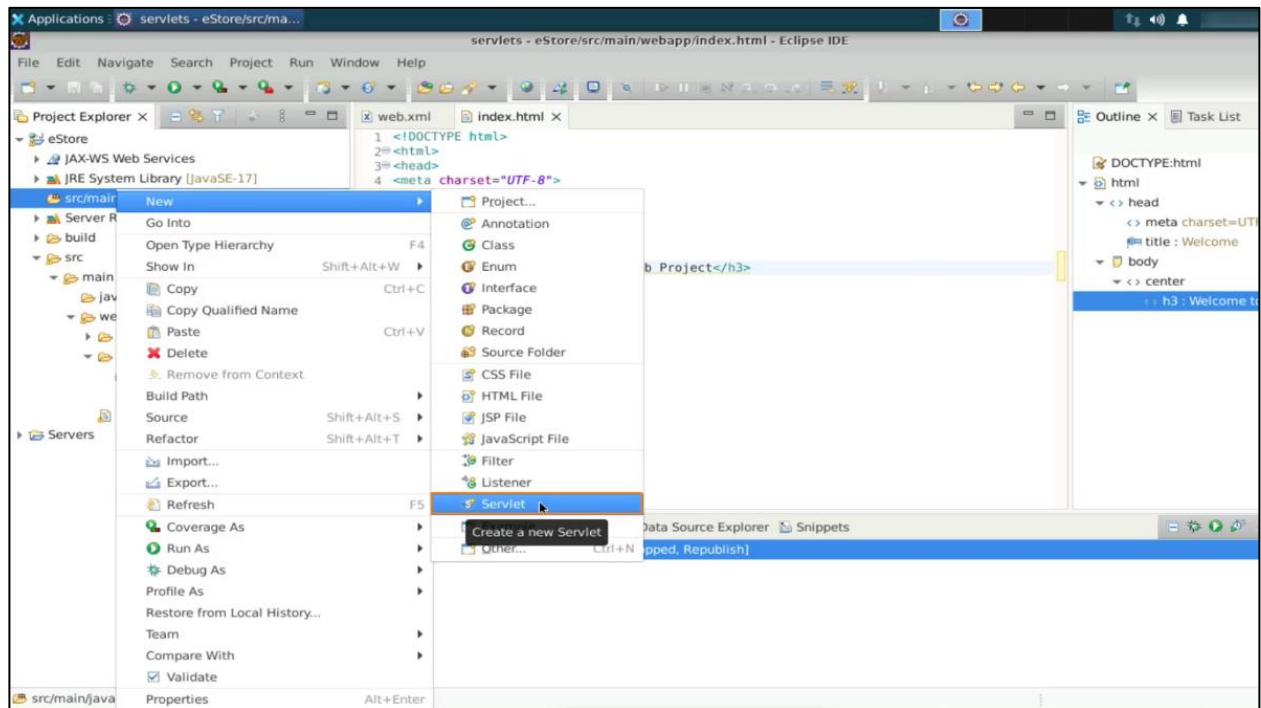


3.5 Change the title tag message **Welcome** and create a **center** tag in the body to print **Welcome to the Dynamic Web Project**. This message will automatically come up whenever this project gets executed (from lines 5 to 10)

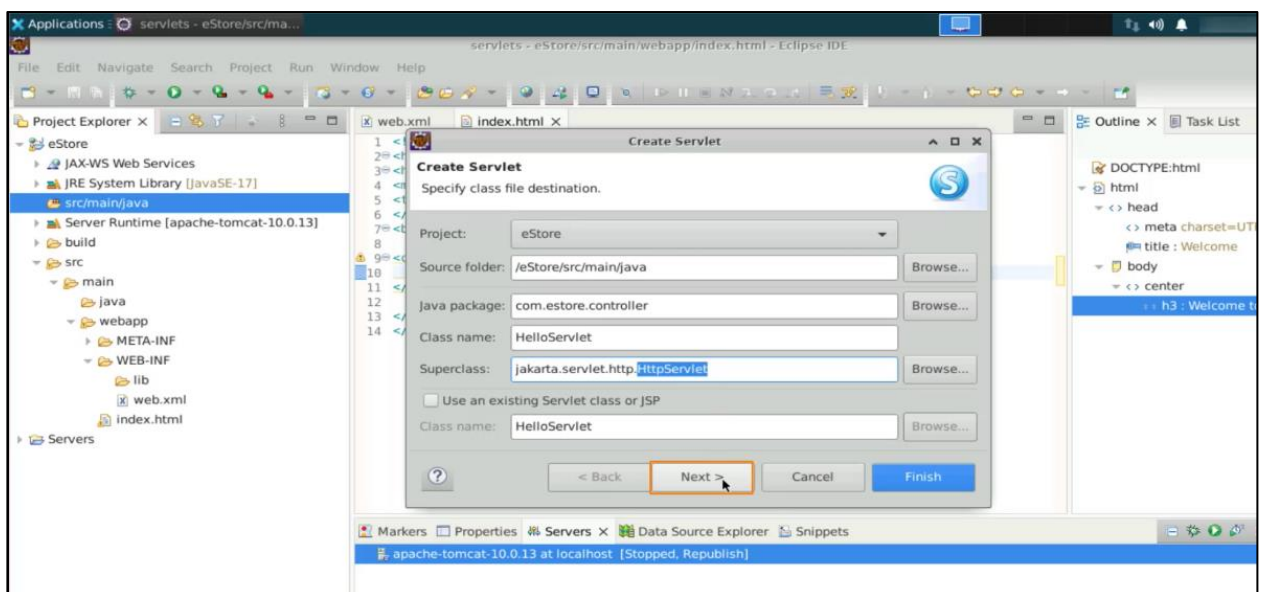


Step 4: Create a Servlet

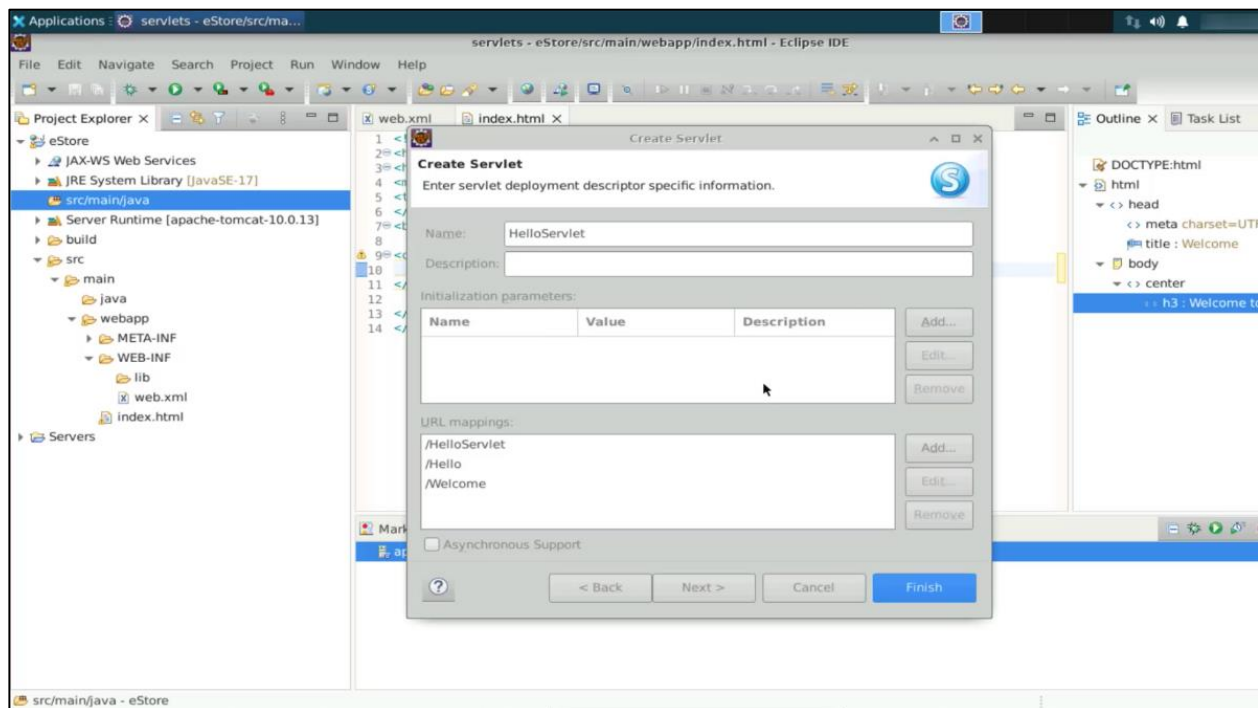
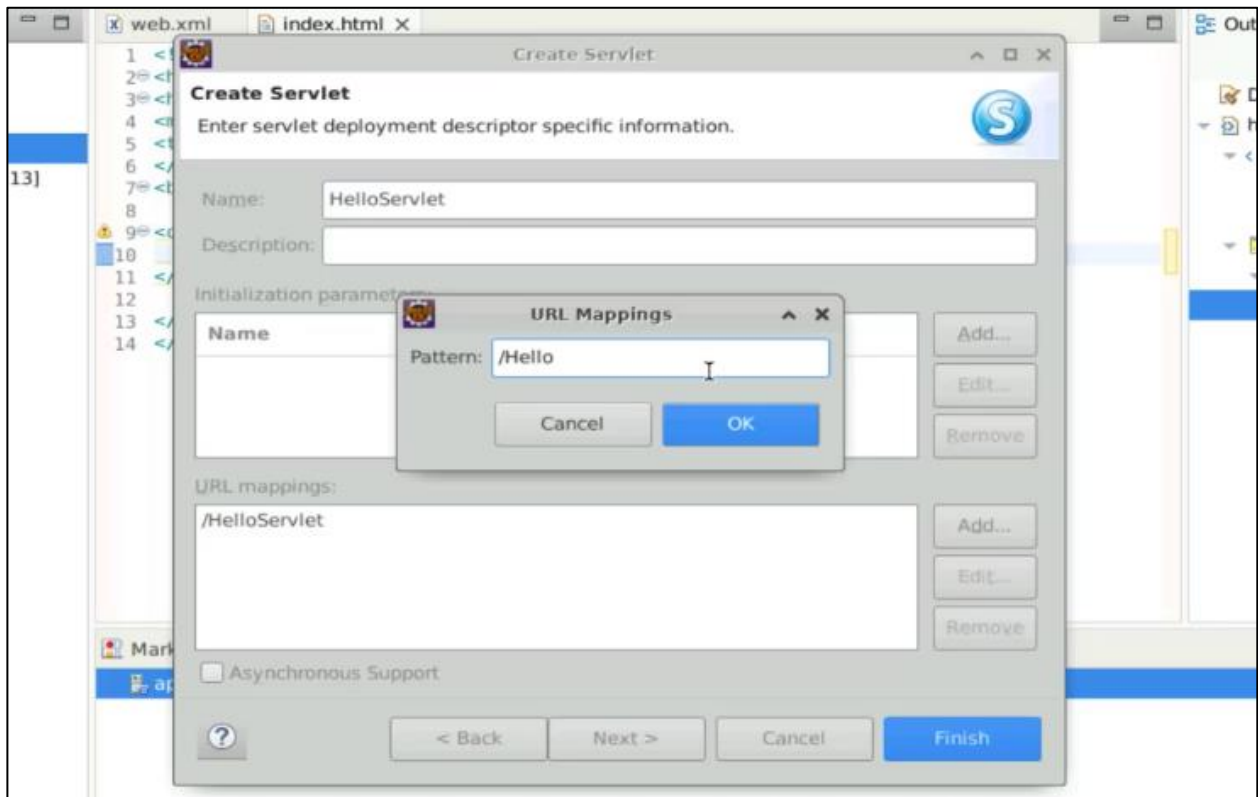
4.1 Now, create a Servlet. Go to **src/main/java**, right-click on it, and select **New > Servlet**



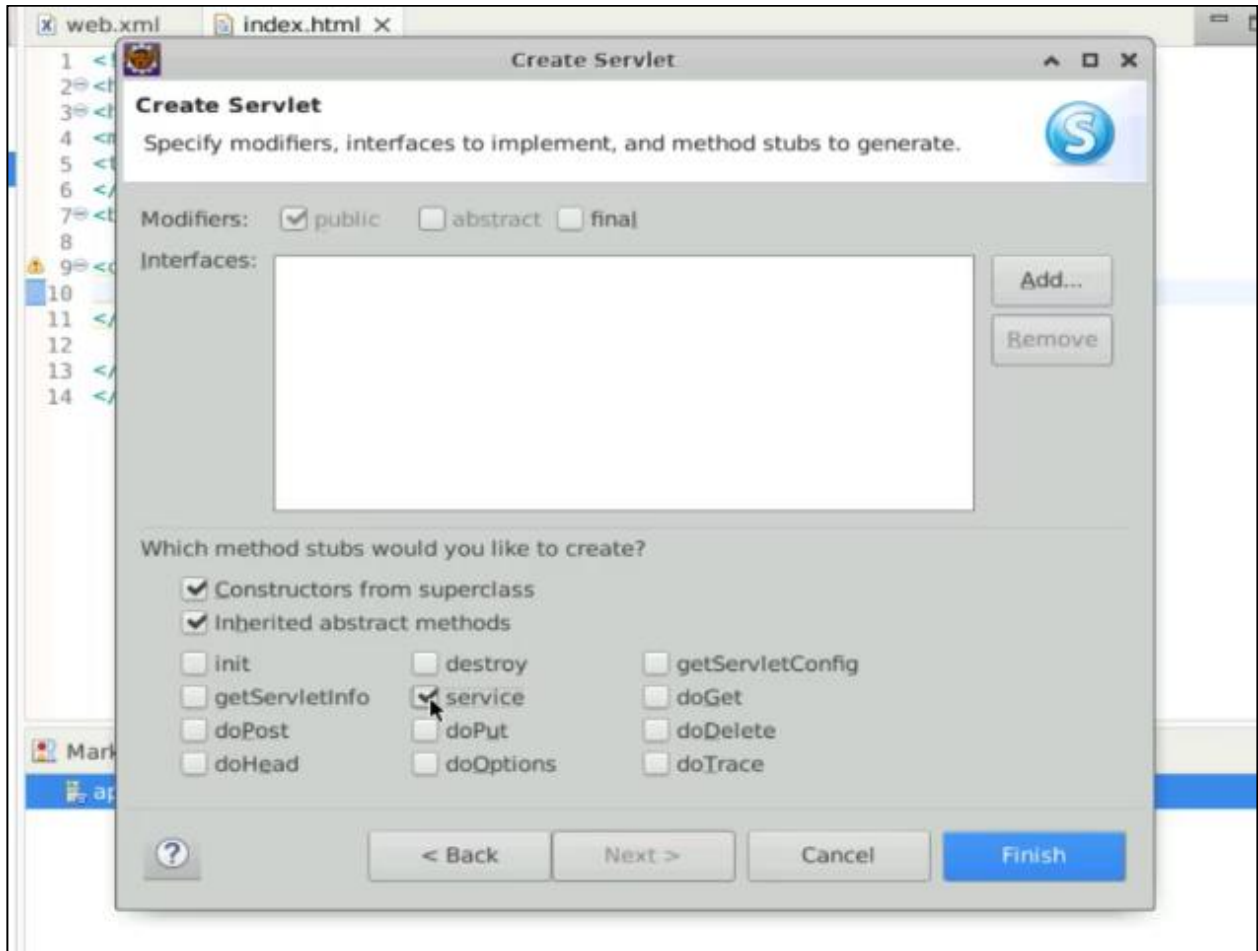
4.2 Enter the package name as **com.estore.controller**, class name as **HelloServlet**, and click on **Next**



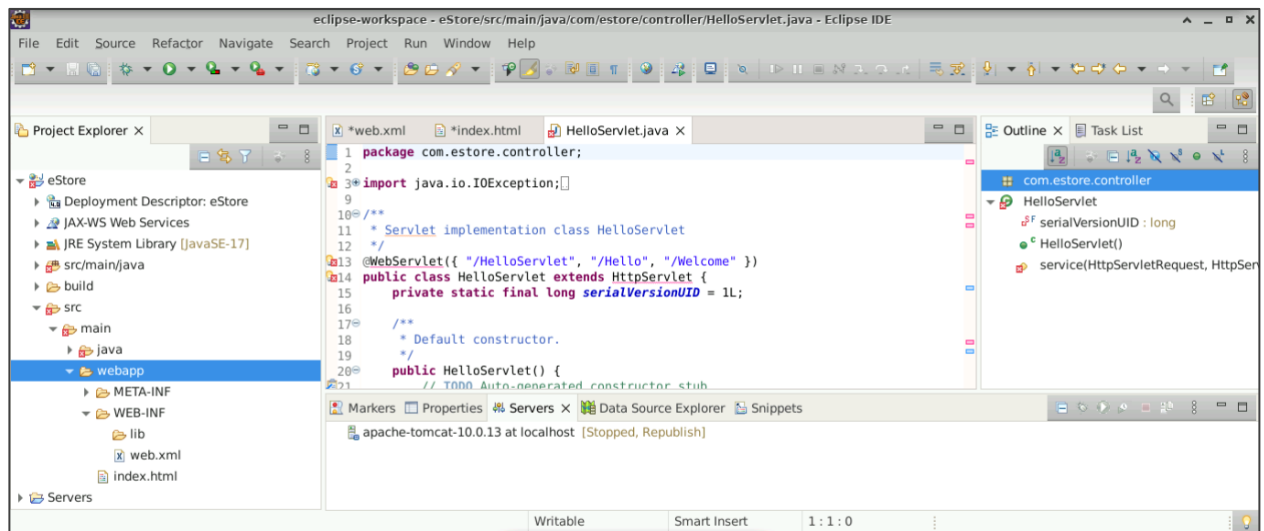
4.3 Click on **Add**, and add other URL mappings, like **/Hello** and **/Welcome**. Click on **Next**



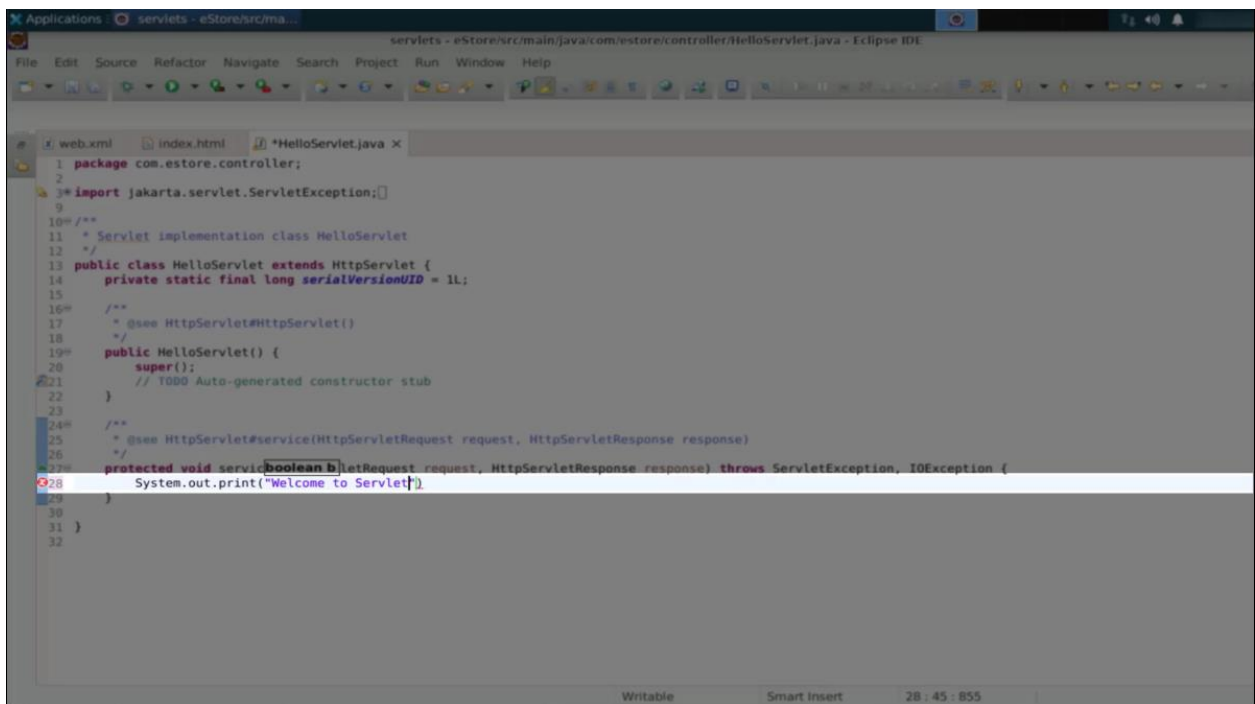
4.4 Select **service**, as service is the method that gets created whenever you send a request, and then click on **Finish**



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/jakartaee" 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>/HelloServlet</url-pattern>
18 <url-pattern>/Hello</url-pattern>
19 <url-pattern>/Welcome</url-pattern>
20 </servlet-mapping>
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.

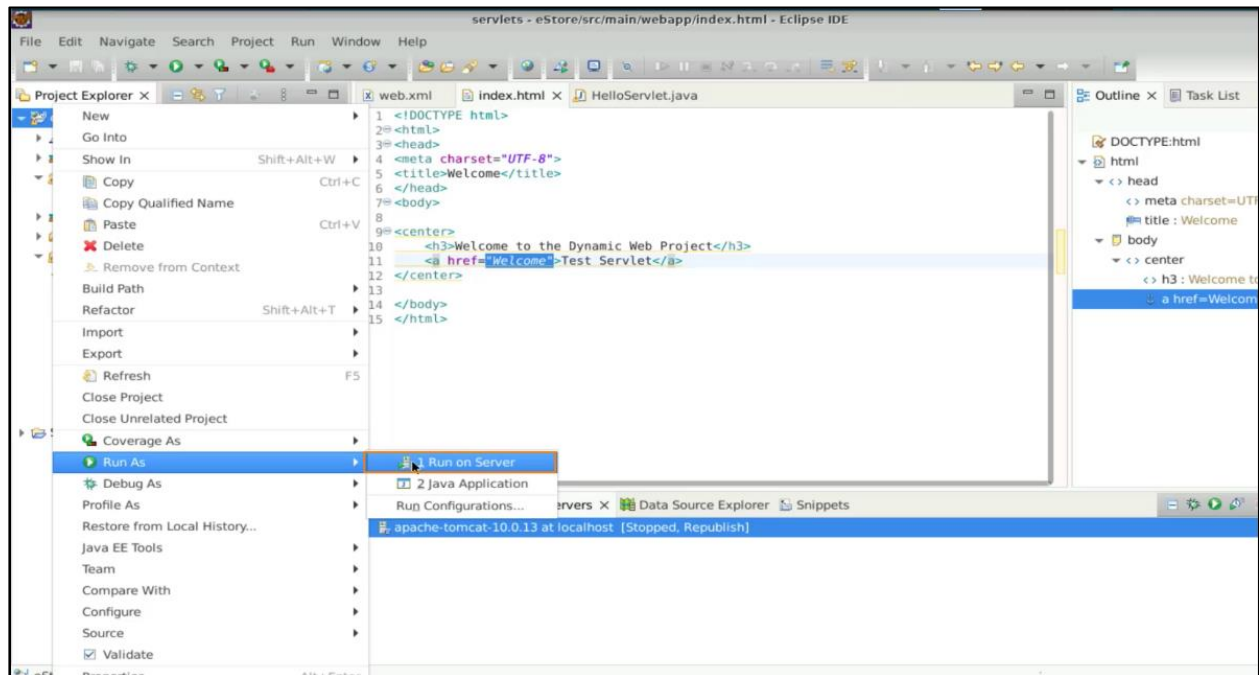
```

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>

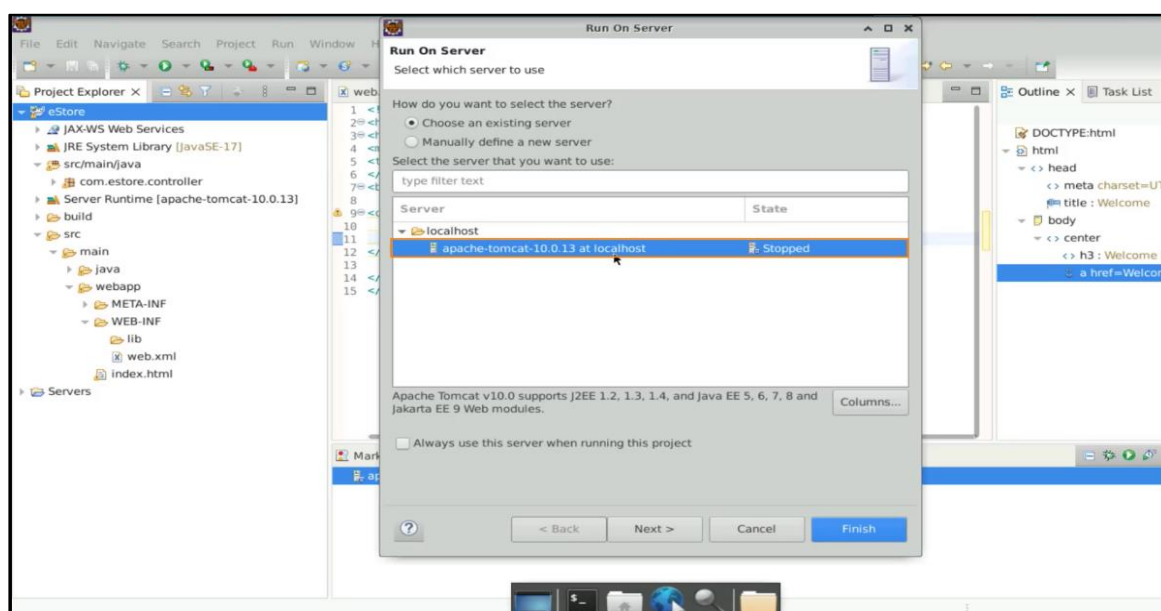
```


Step 5: Run the project and handle the error

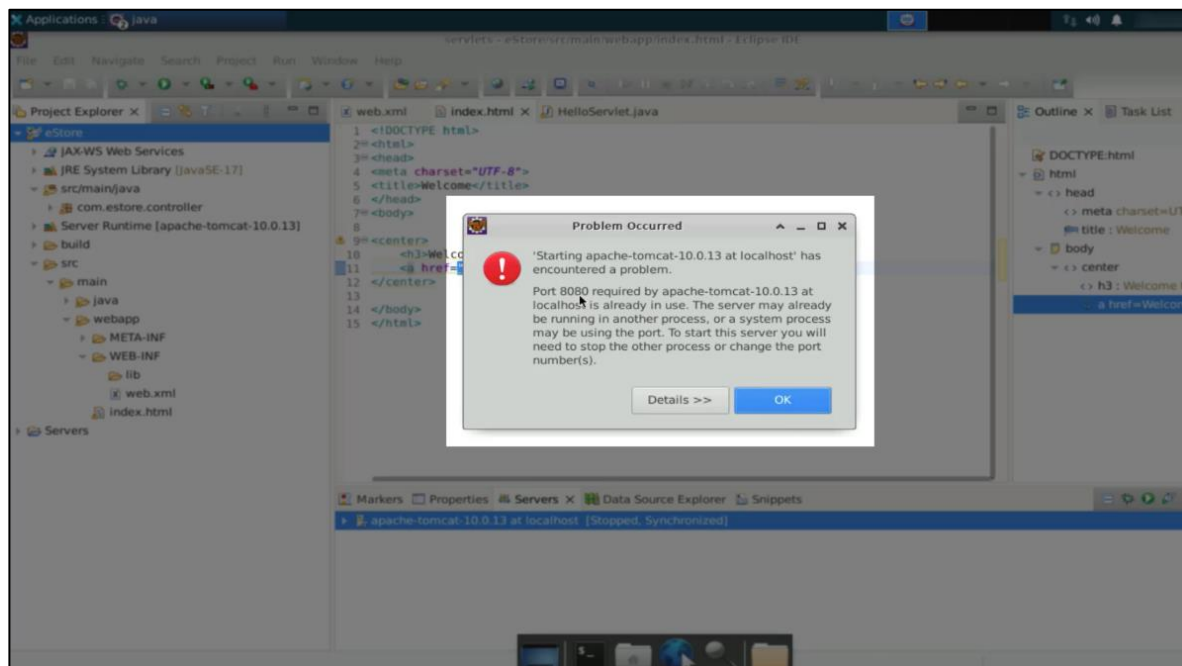
5.1 Go to the **index.html** file and run the project. Right-click on **eStore**, select **Run As**, and then click on **Run on Server**



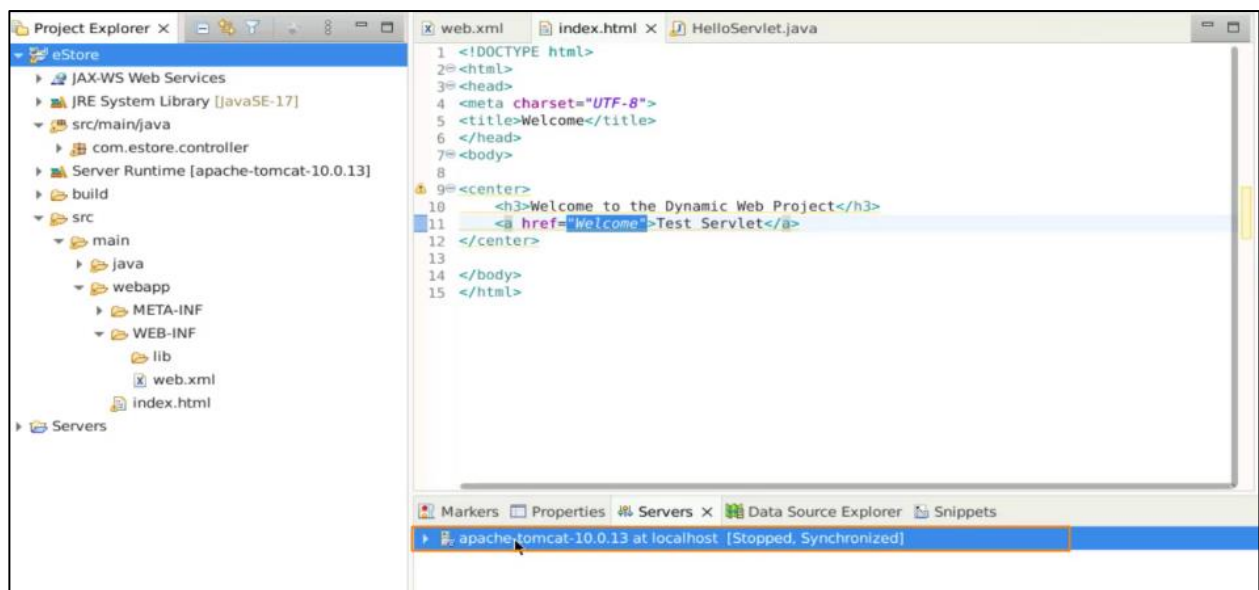
5.2 Select the server **apache-tomcat-10.0.13 at localhost**, and then click on **Finish**



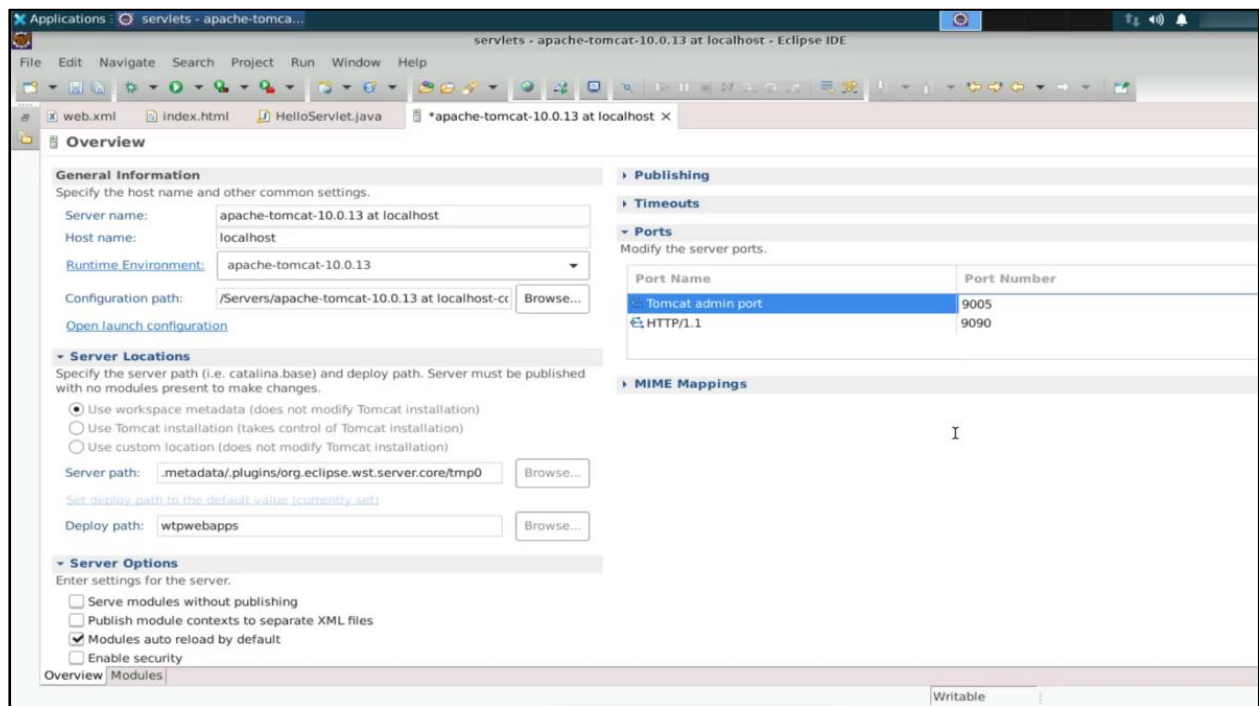
The output has the error stating that port **8080** is already in use.



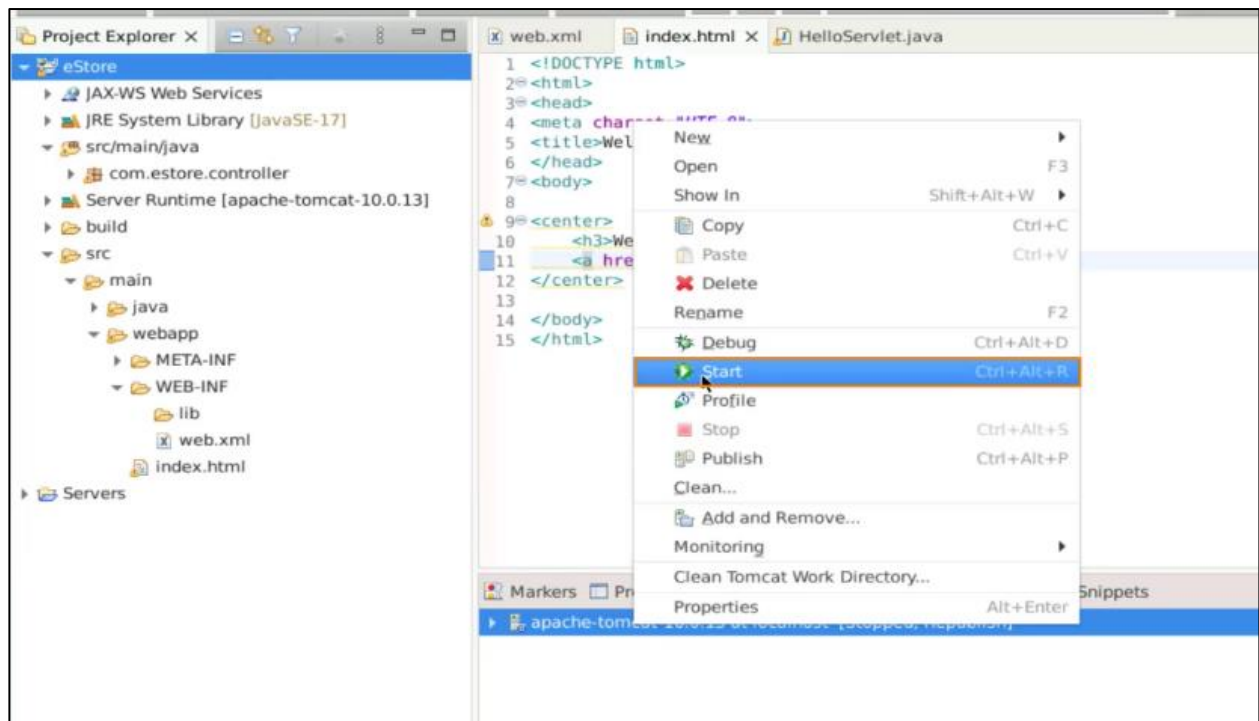
5.3 Open the tomcat file configuration file



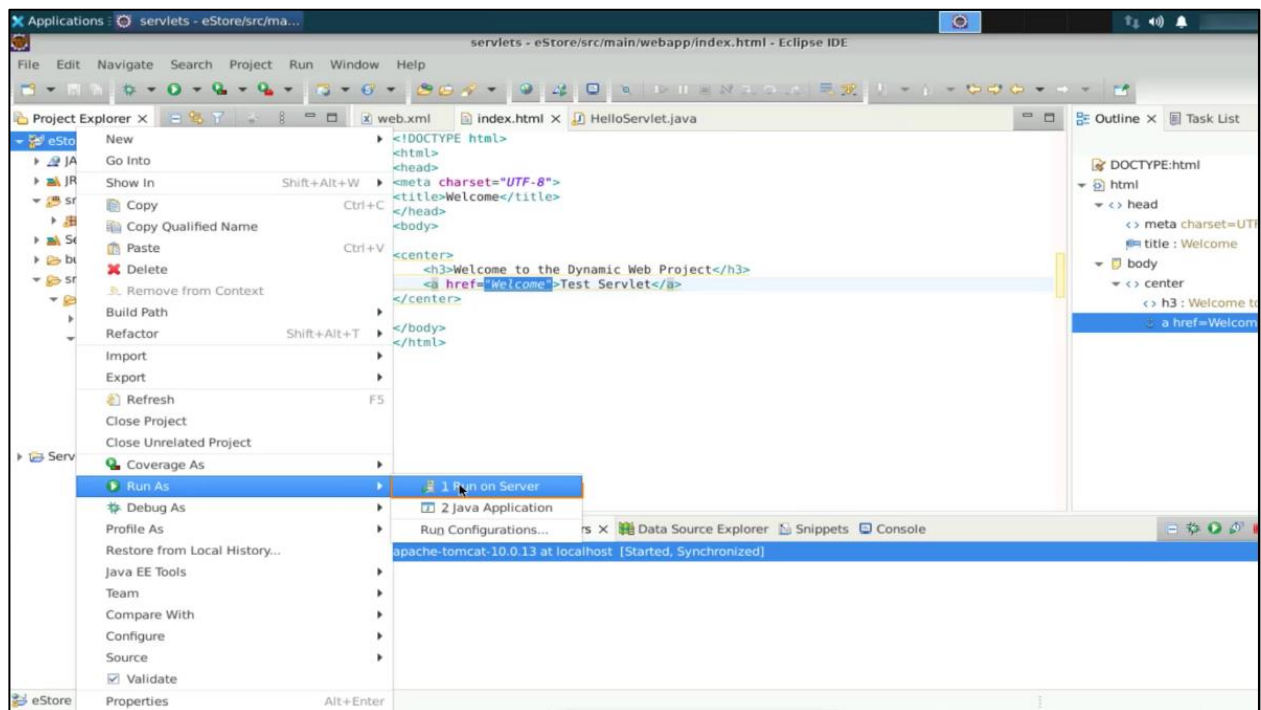
5.4 Change the port number from 8080 to 9090 and the admin port to 9005



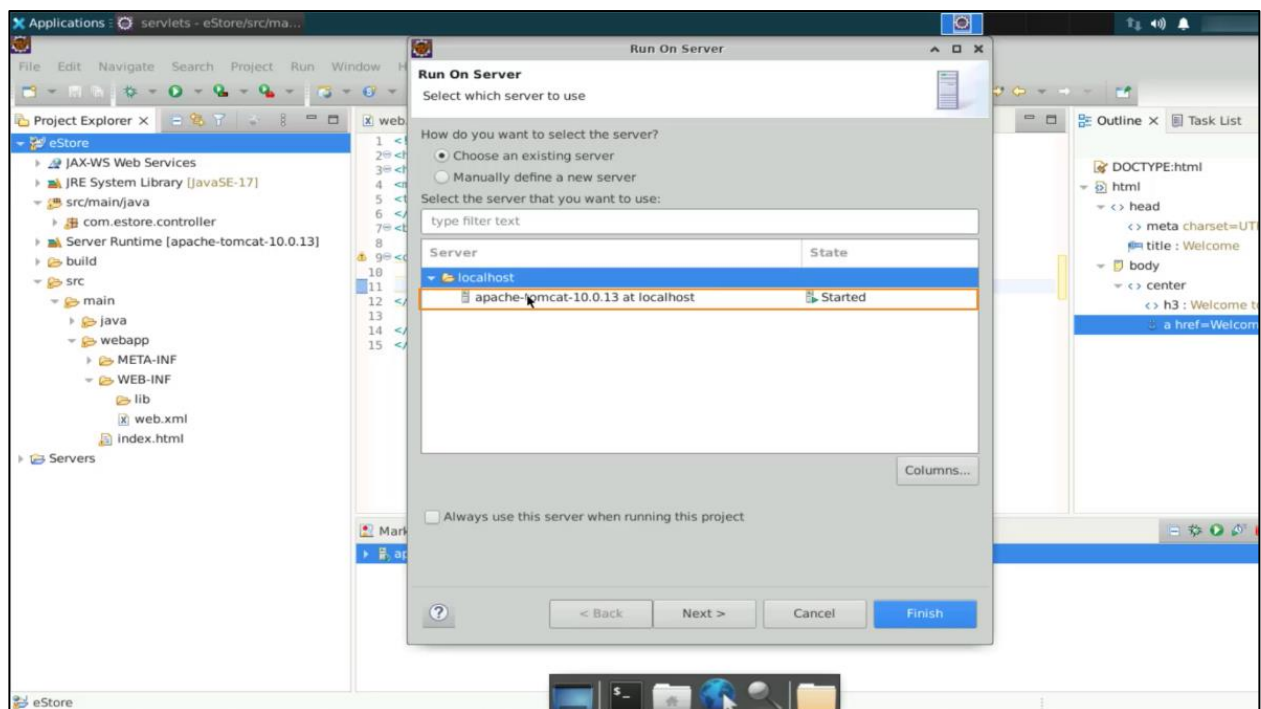
5.5 Save the file, right-click on the screen and select **Start**



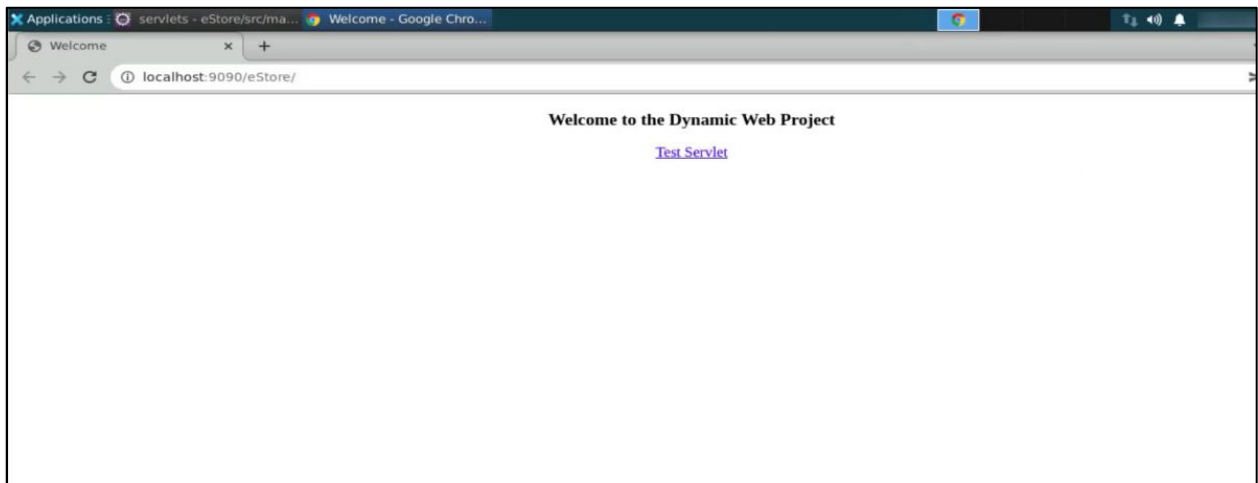
5.6 Now, repeat step 5.1



5.7 Repeat step 5.2

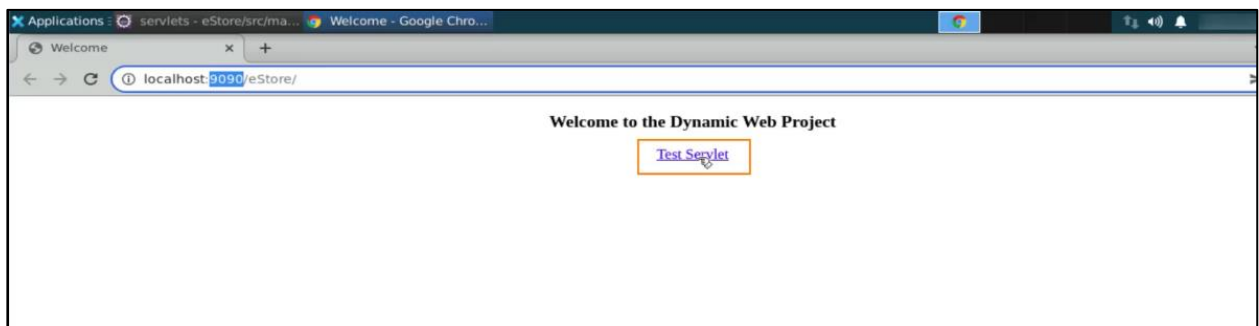


The output displayed will be, **Welcome to the Dynamic Web Project.**

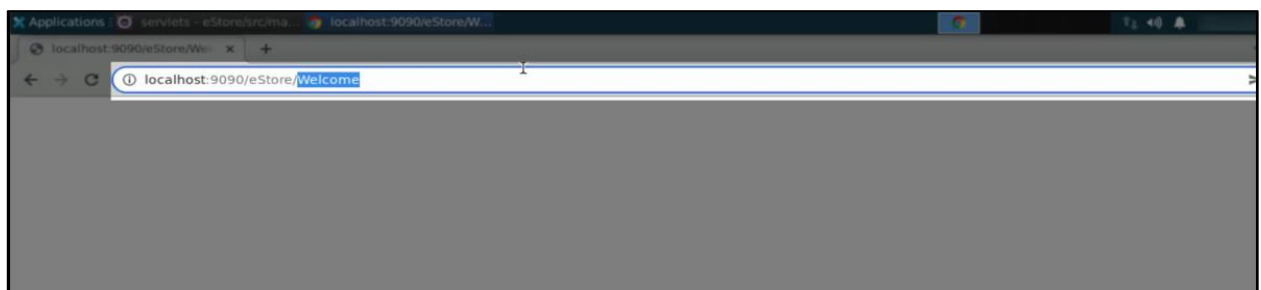


You can see that the program is executed on port number **9090** since **8080** was blocked.

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)

```

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.println("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 }

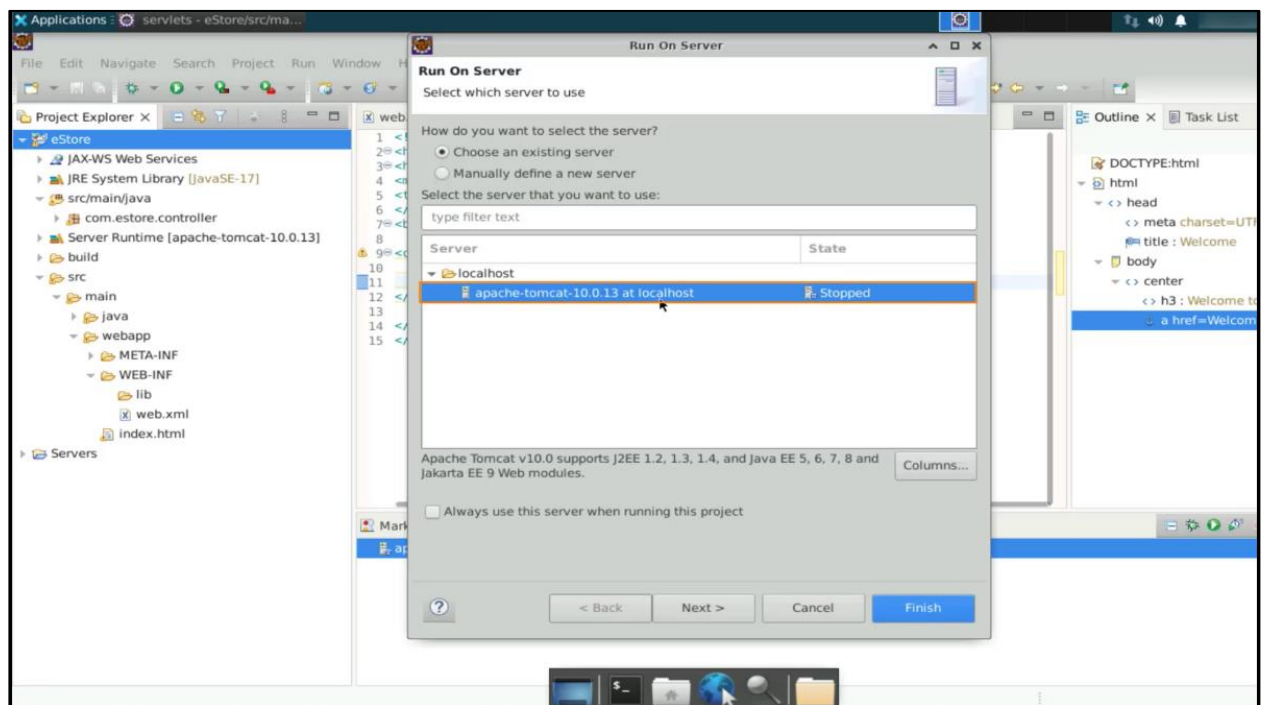
```

6.2 Repeat steps 5.1 and 5.2

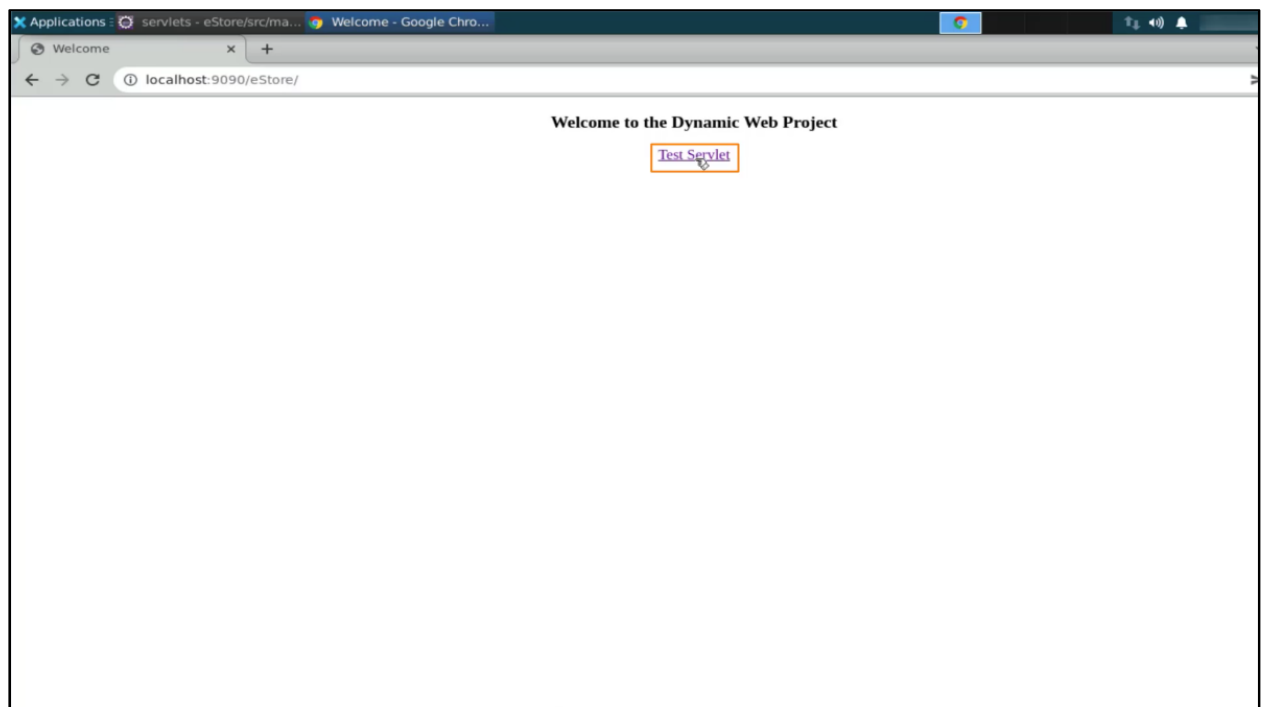
```

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>

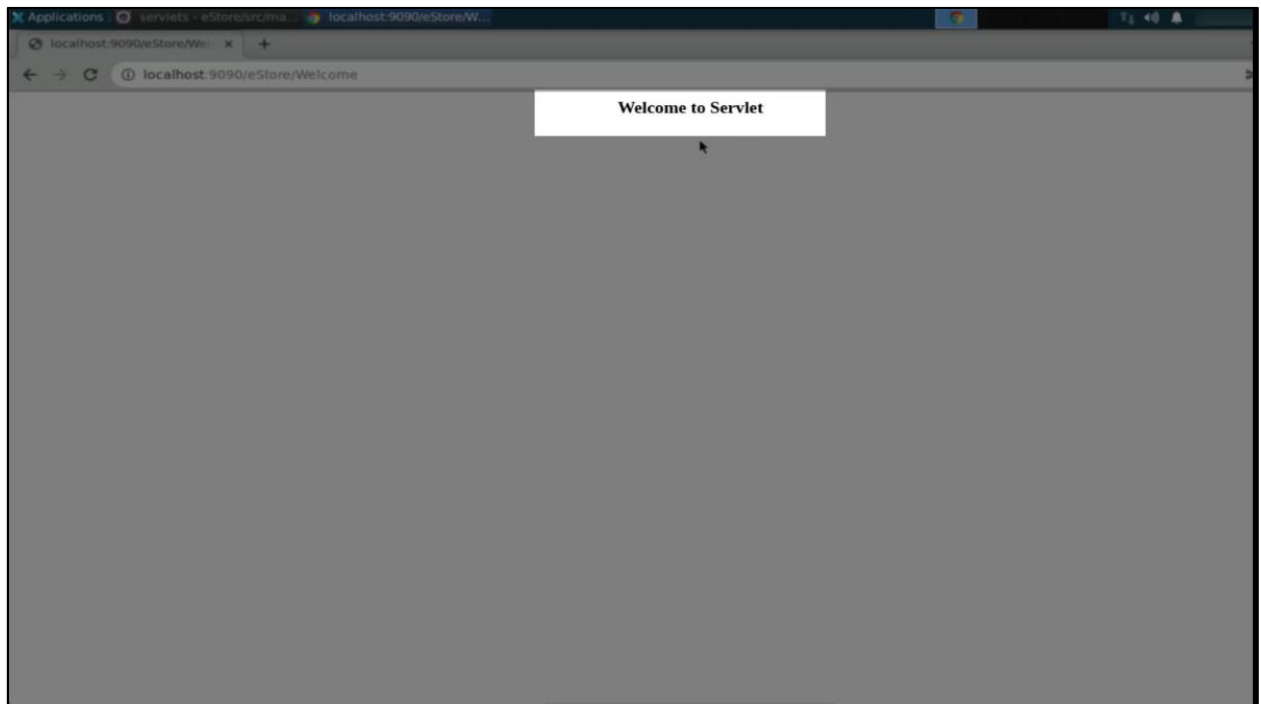
```

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.