SWEN90007 - Software Design and Architecture

Semester 2 – 2020 – Additional Learning Resource for Students

Introduction to Dynamic Web Application Development

We will prepare a fully functional work environment. Then we will learn how to create dynamic web applications project. We will build Servlet based web application using Eclipse IDE for Java EE, and Apache Tomcat server as a web container that supports Servlet technology. So, you will need:

1. Download and install **JDK 14**:
    https://www.oracle.com/java/technologies/javase-jdk14-downloads.html
    *(do not download the JRE. Make sure you download the **JDK**);*
2. Download and unzip Eclipse IDE for **Enterprise Java Developers [IDE 2020-06]**
    (*make sure you download the Enterprise Eclipse, as shown below)*:
    https://www.eclipse.org/downloads/packages/

Eclipse IDE 2020-06 R Packages

Eclipse IDE for Java Developers

208 MB   683,661 DOWNLOADS

The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Maven and Gradle integration

Windows 64-bit
Mac Cocoa 64-bit
Linux 64-bit

Eclipse IDE for Enterprise Java Developers

391 MB   571,088 DOWNLOADS

Tools for developers creating Java Enterprise and Web applications, including a Java IDE, tools for Web Services, JPA and Data Tools, JSF, Mylyn, Maven and Gradle, Git, and more.

Click here to file a bug against Eclipse Web Tools Platform.
Click here to file a bug against Eclipse Platform.
Click here to file a bug against Maven integration for web projects.
Click here to report an issue against Eclipse Wild Web Developer (incubating).

Installation of stable release of node.js is strongly recommended.

Windows 64-bit
Mac Cocoa 64-bit
Linux 64-bit

3. Download and unzip Apache Tomcat 9.0:
   https://tomcat.apache.org/download-90.cgi
   (a directory of your choice. There's no installation for Apache, just unzip the project somewhere and make sure you remember that 😊).

9.0.37

Please see the README file for packaging information. It explains what every distribution contains.

Binary Distributions

- Core:
  - zip (pgp, sha512)
  - tar.gz (pgp, sha512)
  - 32-bit Windows zip (pgp, sha512)
  - 64-bit Windows zip (pgp, sha512)
  - 32-bit/64-bit Windows Service Installer (pgp, sha512)

Part 1: Setting up runtime environment:

1. Configure Java JRE in Eclipse:

- In eclipse, select from the menu Window ‣ Preferences ‣ Java ‣ Installed JRE
- Choose **Java SE 14** as below, then click "Apply and Close"
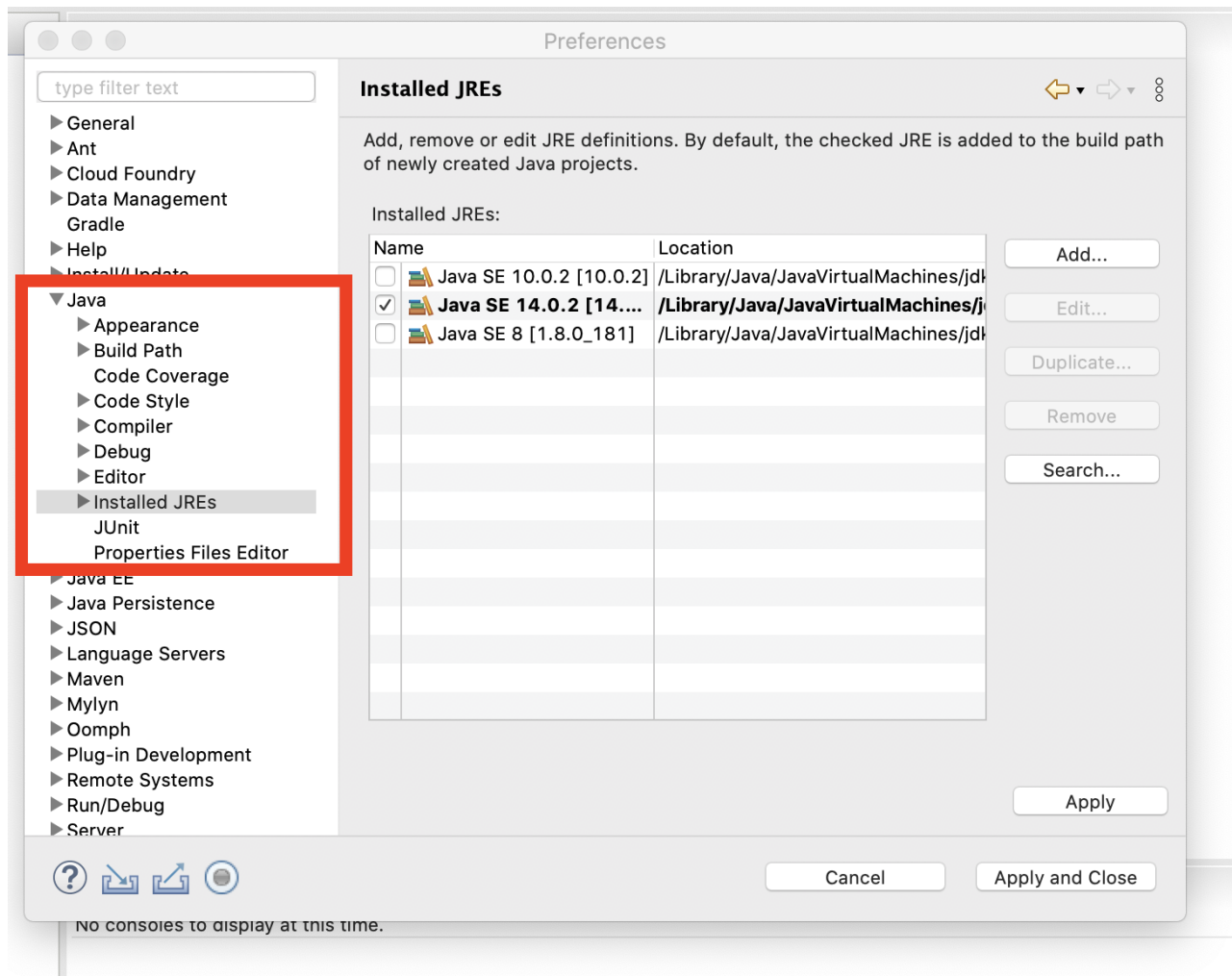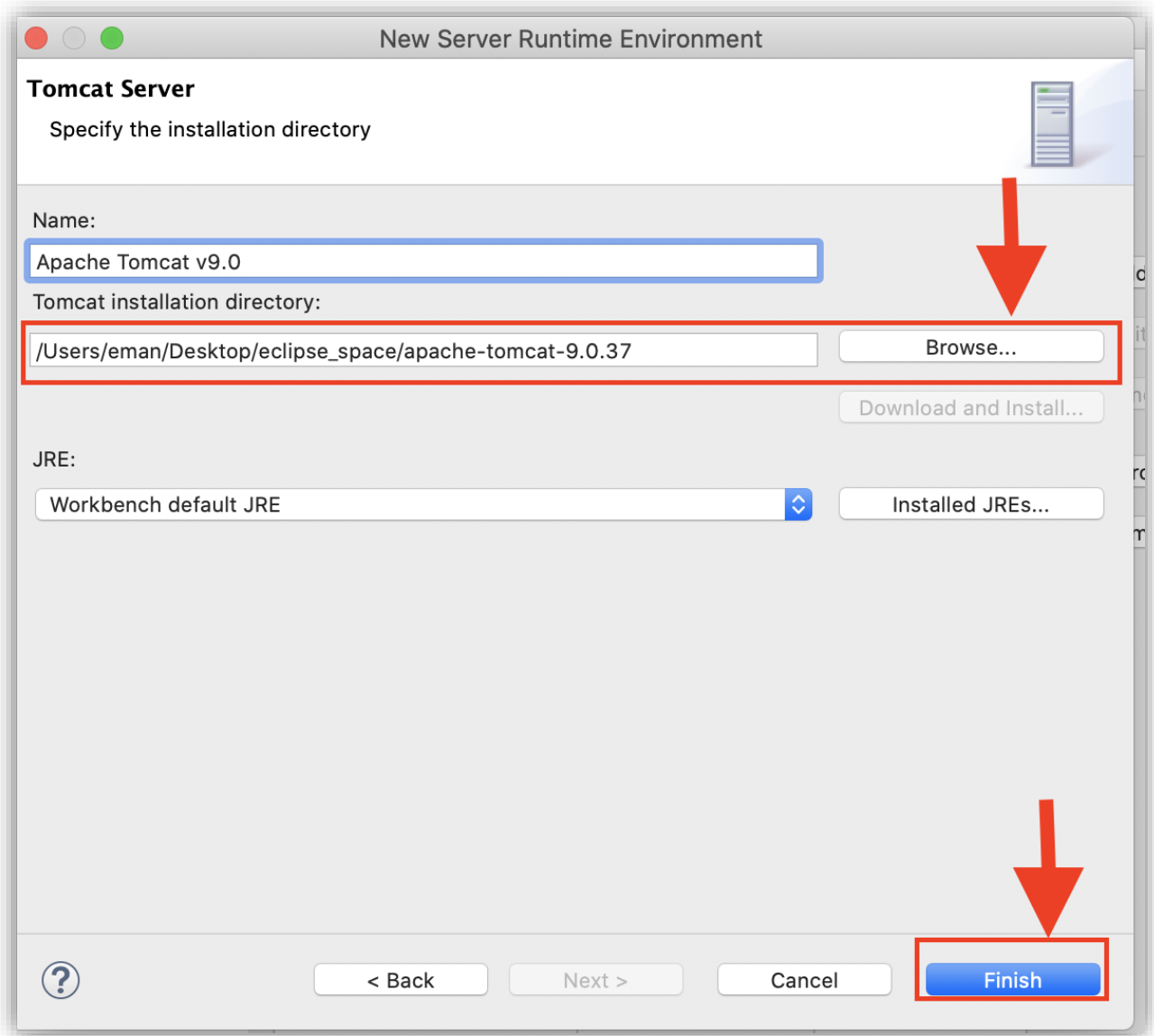
2. Configure Apache Tomcat in Eclipse:

- In eclipse, select from the menu Window ▸ Preferences ▸ Server ▸ Runtime Environments.
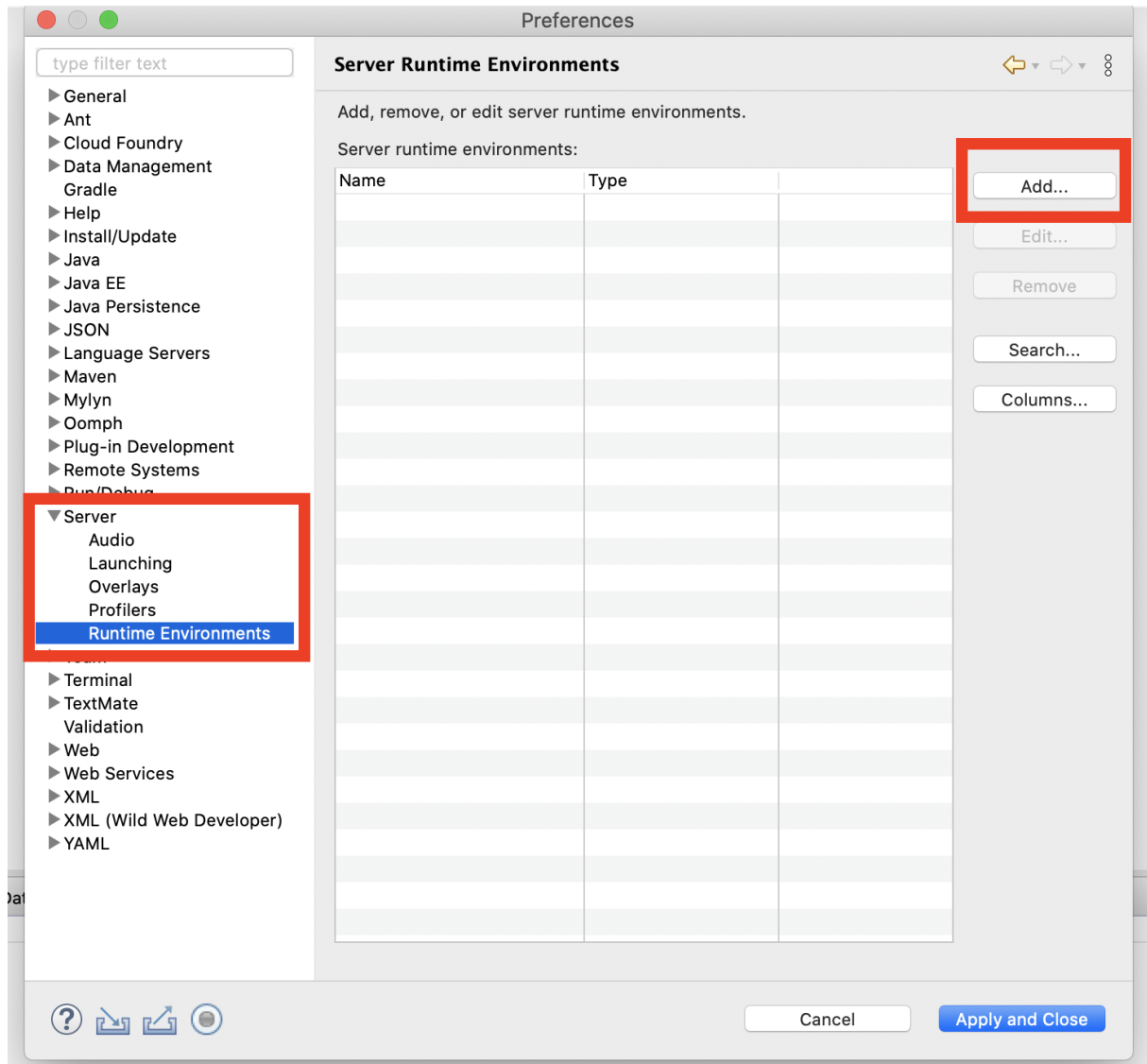
- Click Add, then choose Apache Tomcat 9 as the server type.
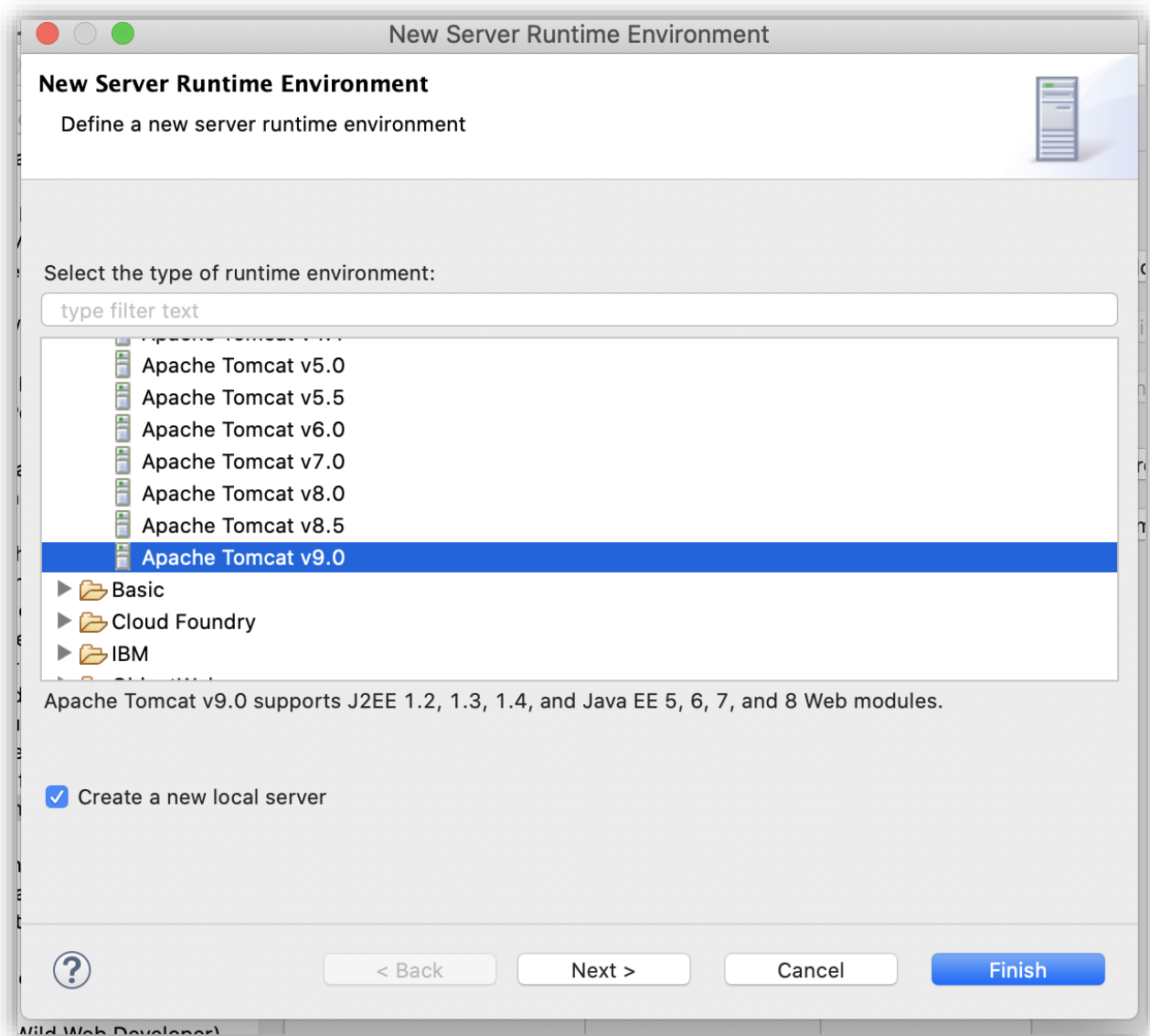
- Set **Tomcat installation directory**: (wherever you unzipped your Apache) as the path for the installation directory.

Now your are ready to create your first project ^_^
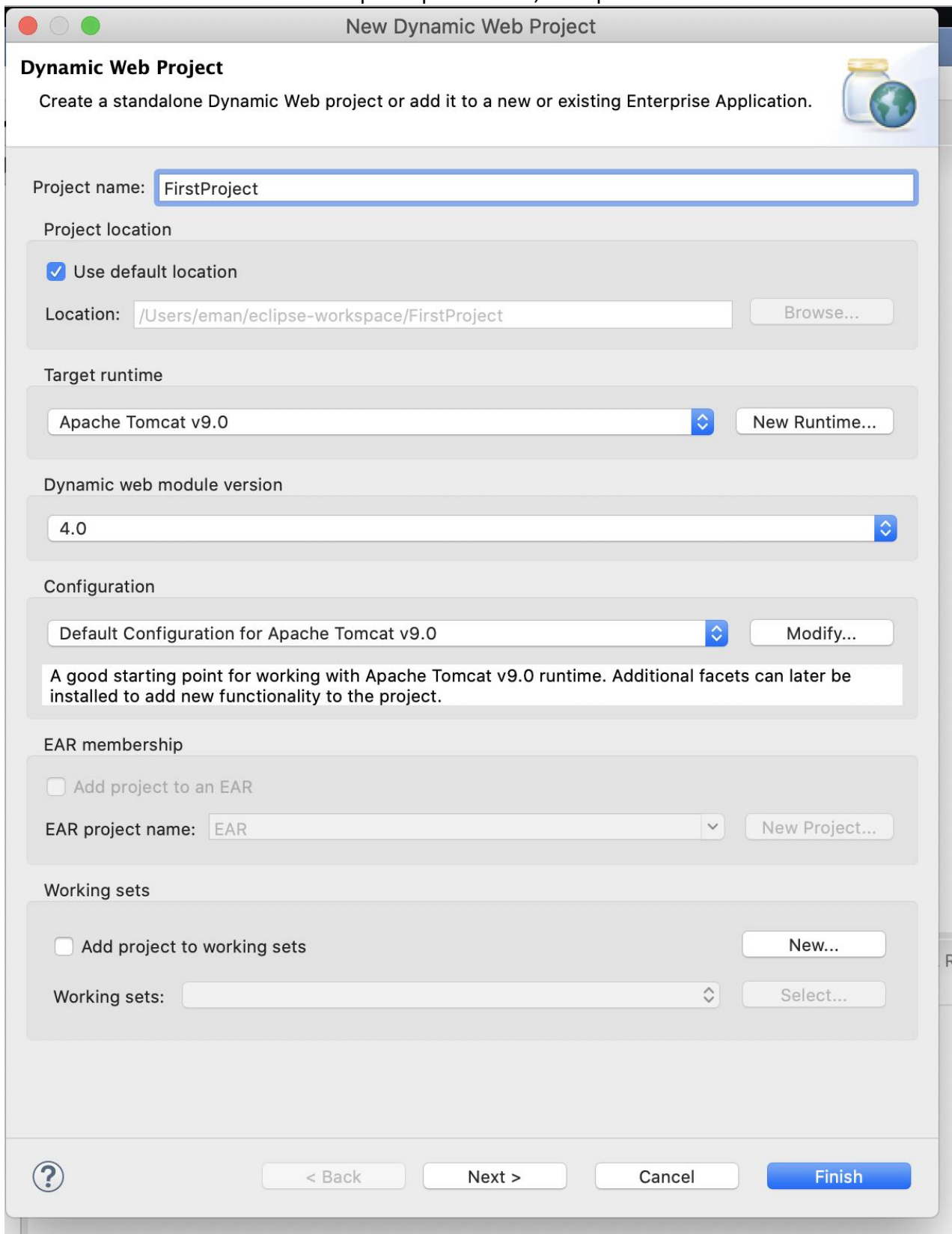
Part 2: Create a dynamic web project:

- In eclipse, click "File", Click "New", click "Dynamic Web Project" (if "Dynamic Web Project" does not show up in the submenu, please click the bottom "other" and choose "Dynamic Web Project" under **web** folder, and you will be able to select from "Select a Wizard")
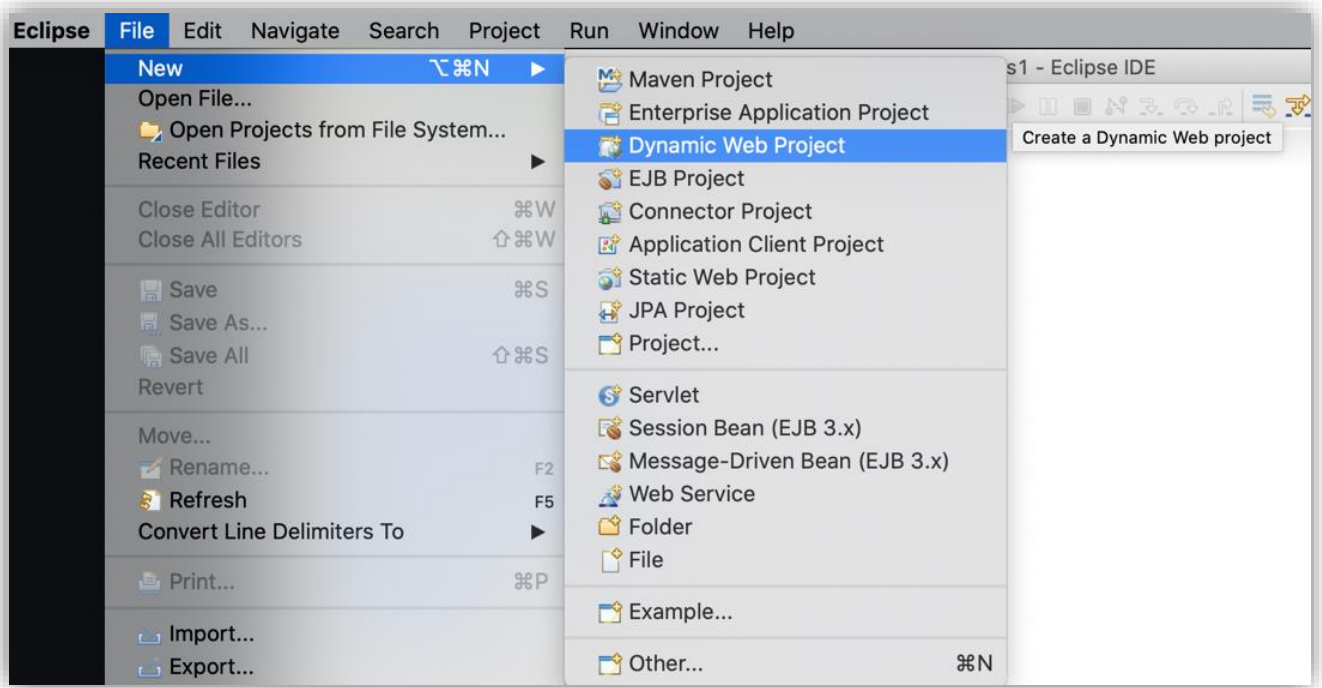
- Name it as "FirstProject".
- Choose Apache Tomcat 9.0 as the runtime.

- Use default values for the required parameters, then press Next.

- In the last screen "check" the "`Generate web.xml deployment descriptor`" before clicking "Finish"
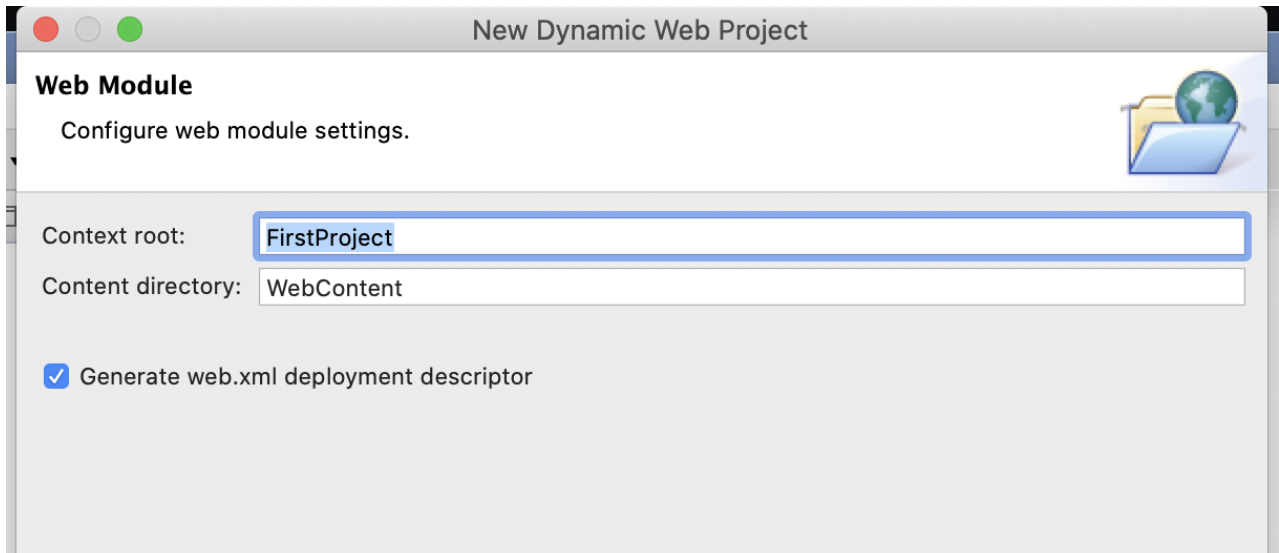

Now, a new web project is created. The project description file web.xml is created under directory *WebContent/WEB-INF/web.xml*

If you accidentally imported the project as a Java project, you can convert it to EE by following the steps below:
- **Step-1. Open your Java Project.**
- **Step-2. Right Click on Project -> Properties.**
- **Step-3. Click on " Project Facets " from left menu. Click on Convert to faceted form...**
- **Step-4. Click Dynamic Web Project and Java checkbox.**
- **Step-5. Click Apply and Ok.**

Run the project

- Create a new file `index.html,` it will be under "`Web Content`" folder
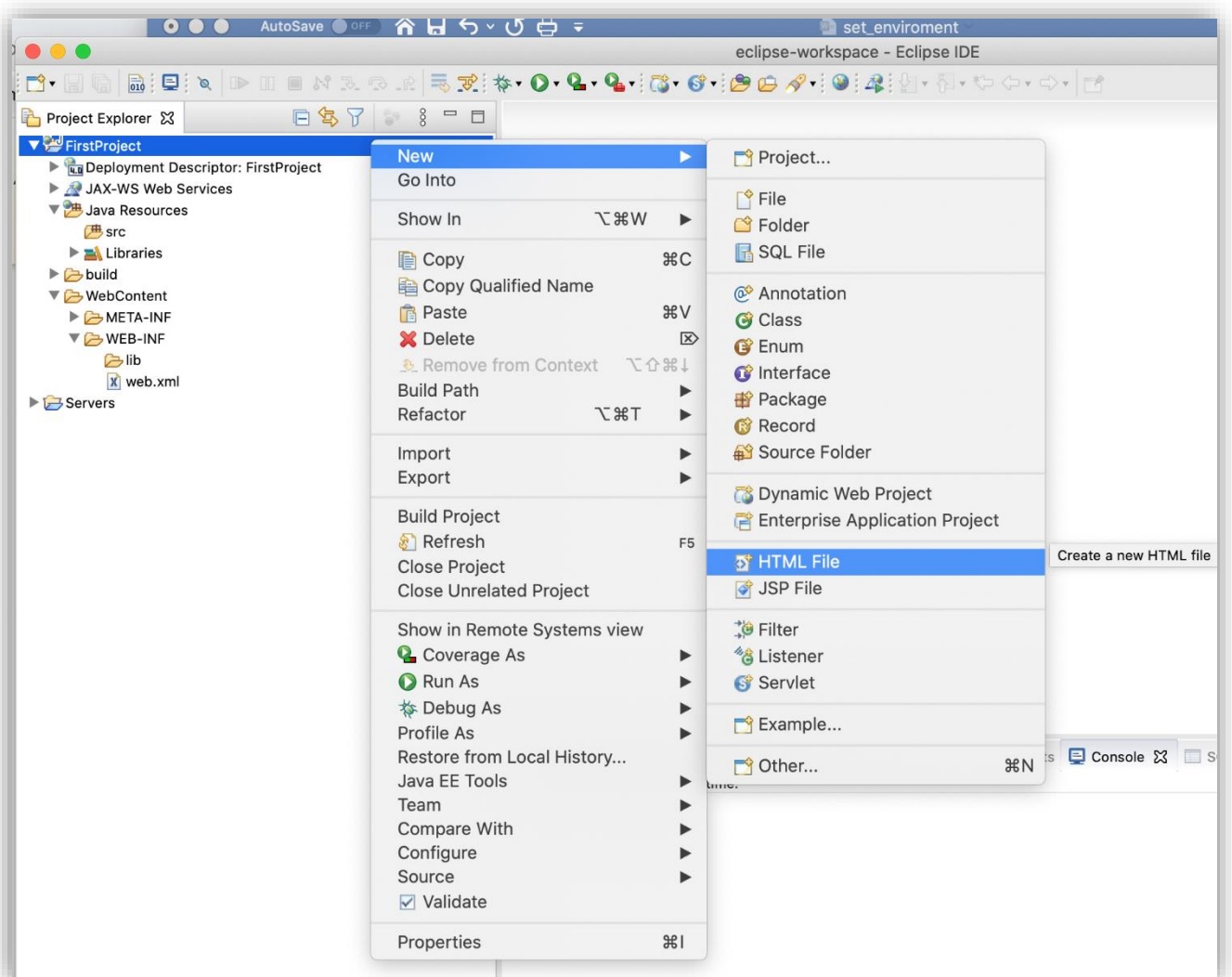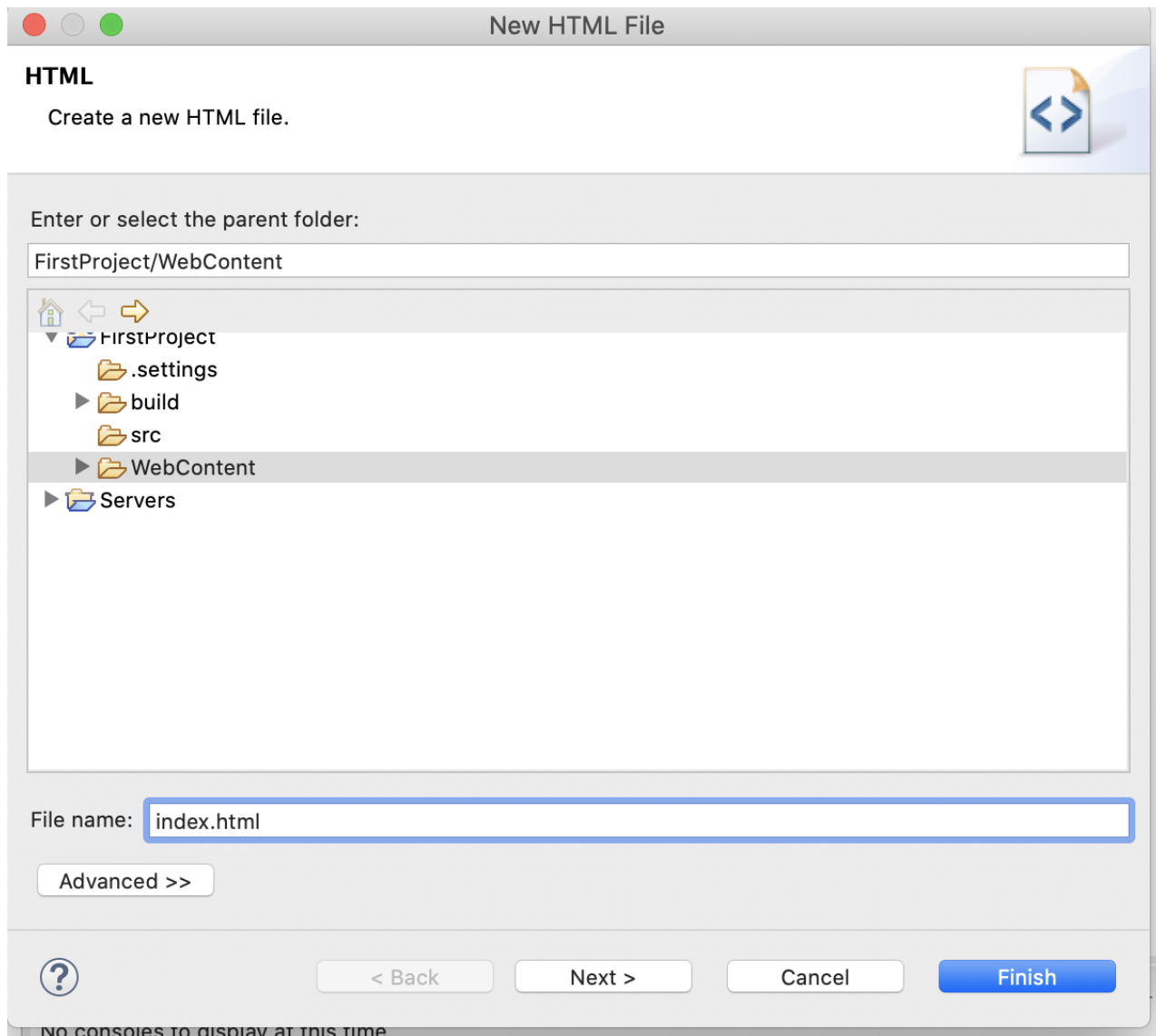
- Add the following to `index.html`:

```html
1  <!DOCTYPE html>
2  <html>
3  <head>
4  <meta charset="UTF-8">
5  <title>Our First Project</title>
6  </head>
7  <body>
8  Hello SWEN90007
9  </body>
10 </html>
```

- Run the project choosing "Run on Server" option and view the output on
  `[http://localhost:[APACHE_TOMCAT_PORT]/[Project_name]/]`
  `[http://localhost:8080/FirstProject/]`

Note: The default [APACHE TOMCAT PORT] is 8080 .

Note: If you get an error with this code, ensure that by copying and pasting you haven't introduced new characters. This is, ISO-8859-1 should be one word, not split into separate lines. If still doesn't work, remove [charset=ISO-8859-1]

Note: The Tomcat server can be installed separately as a service too. In that case you need to deploy the application manually to the tomcat server folder locations. We recommend you to avoid this step at this stage. Download the zip file of tomcat as advised above and extract it on to C drive (or any other drive you like) and refer to that path in settings.
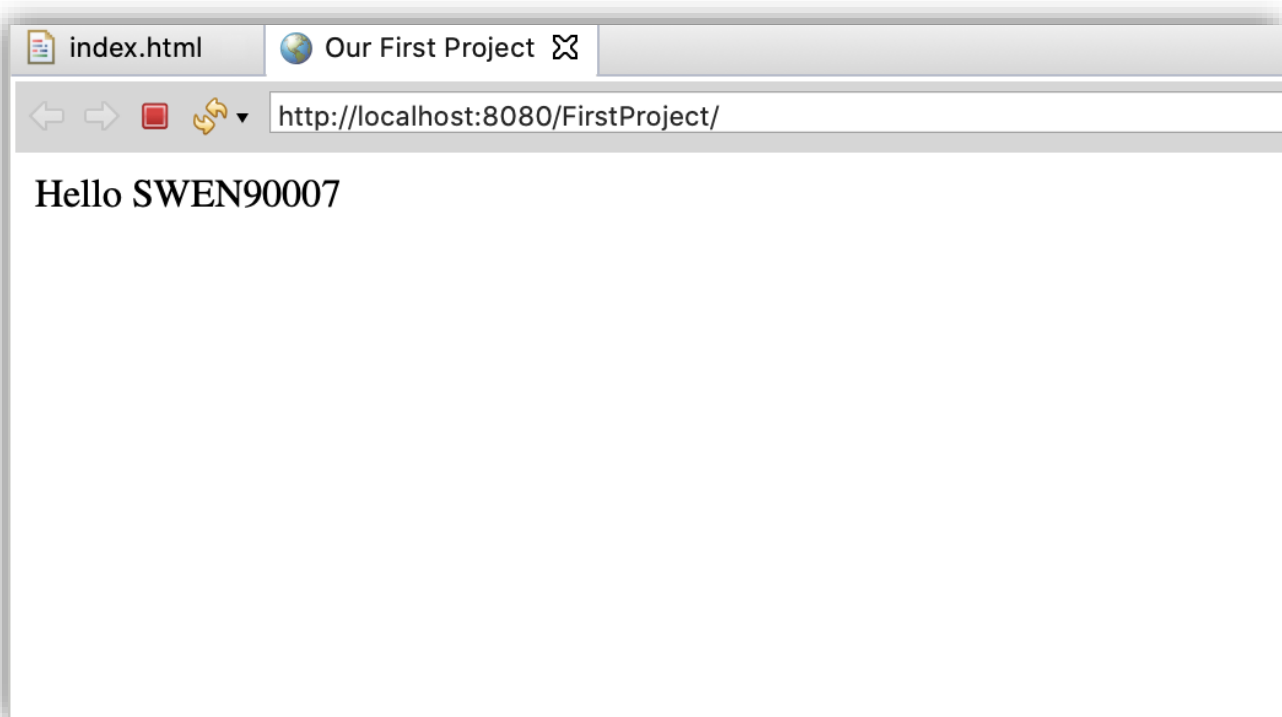
Next: develop a simple Servlet based web application