MDTU JAVA Workshop
Worksheet 04

Objective

The objective of the worksheet sheet is to rebuild applications in **practical 3** and **exercise 3** as a fully functional dynamic Java web application using JSP/Servlets and MVC architecture

Java Web Applications (Java servlet)

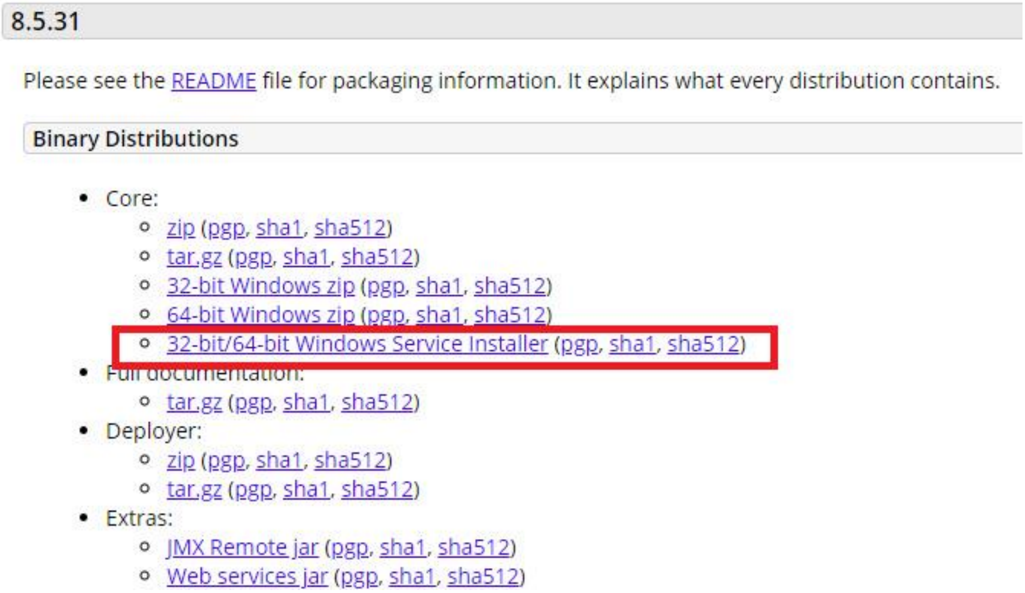
Servlet technology is used to create a web application (resides at server side and generates a dynamic web page).

Servlet technology is robust and scalable because of java language. Before Servlet, CGI (Common Gateway Interface) scripting language was common as a server-side programming language. However, there were many disadvantages to this technology.

There are many interfaces and classes in the Servlet API such as Servlet, GenericServlet, HttpServlet, ServletRequest, ServletResponse, etc.

1. Installing Tomcat server

You can download Tomcat from **Apache Tomcat 9** website pages. Go for Binary Installable versions like **32-bit/64-bit Windows Service Installer (pgp, sha1, sha512).**



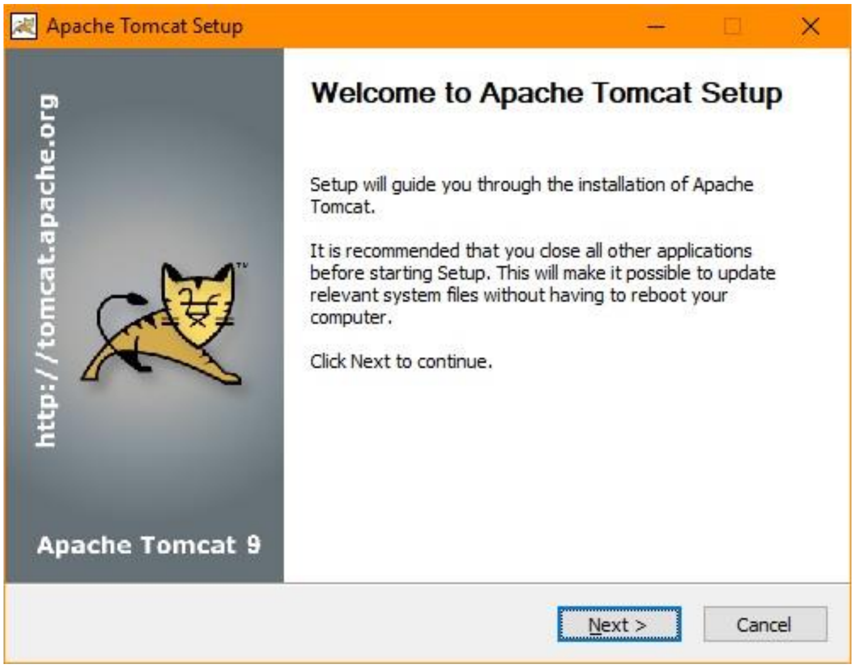
8.5.31

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

Binary Distributions

- Core:
  - zip (pgp, sha1, sha512)
  - tar.gz (pgp, sha1, sha512)
  - 32-bit Windows zip (pgp, sha1, sha512)
  - 64-bit Windows zip (pgp, sha1, sha512)
  - 32-bit/64-bit Windows Service Installer (pgp, sha1, sha512)
- Full documentation:
  - tar.gz (pgp, sha1, sha512)
- Deployer:
  - zip (pgp, sha1, sha512)
  - tar.gz (pgp, sha1, sha512)
- Extras:
  - JMX Remote jar (pgp, sha1, sha512)
  - Web services jar (pgp, sha1, sha512)

After downloading the installer, proceed to run it. Press Next to continue.



Apache Tomcat Setup

http://tomcat.apache.org

Apache Tomcat 9

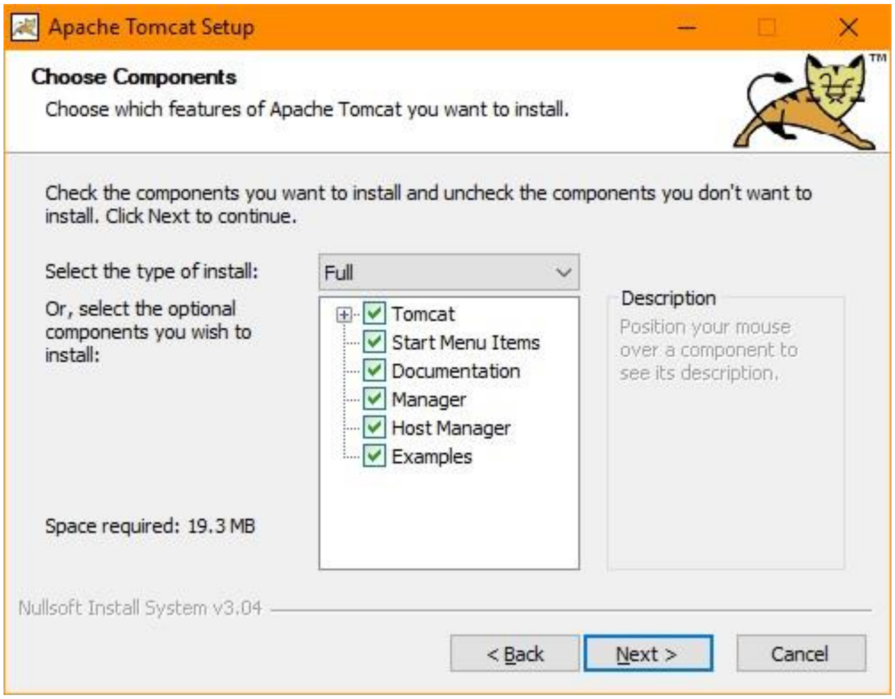
Welcome to Apache Tomcat Setup

Setup will guide you through the installation of Apache Tomcat.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

Then choose the components to install. You can select the ones you want, but I recommend that you do a full installation.



Apache Tomcat Setup

Choose Components

Choose which features of Apache Tomcat you want to install.

Check the components you want to install and uncheck the components you don't want to install. Click Next to continue.

Select the type of install: Full

Or, select the optional components you wish to install:

- ☑ Tomcat
- ☑ Start Menu Items
- ☑ Documentation
- ☑ Manager
- ☑ Host Manager
- ☑ Examples

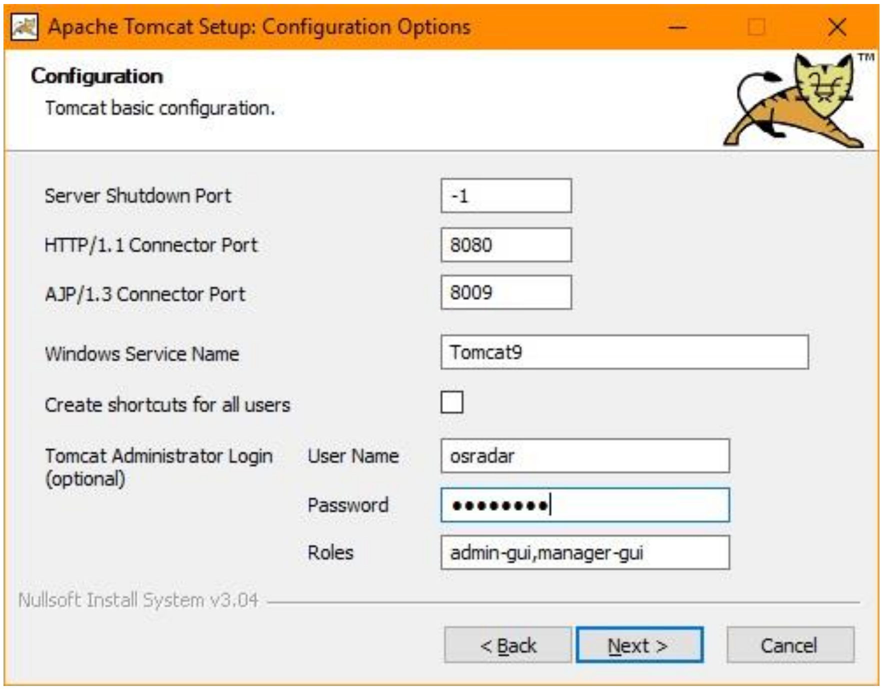
Description

Position your mouse over a component to see its description.

Space required: 19.3 MB

Nullsoft Install System v3.04

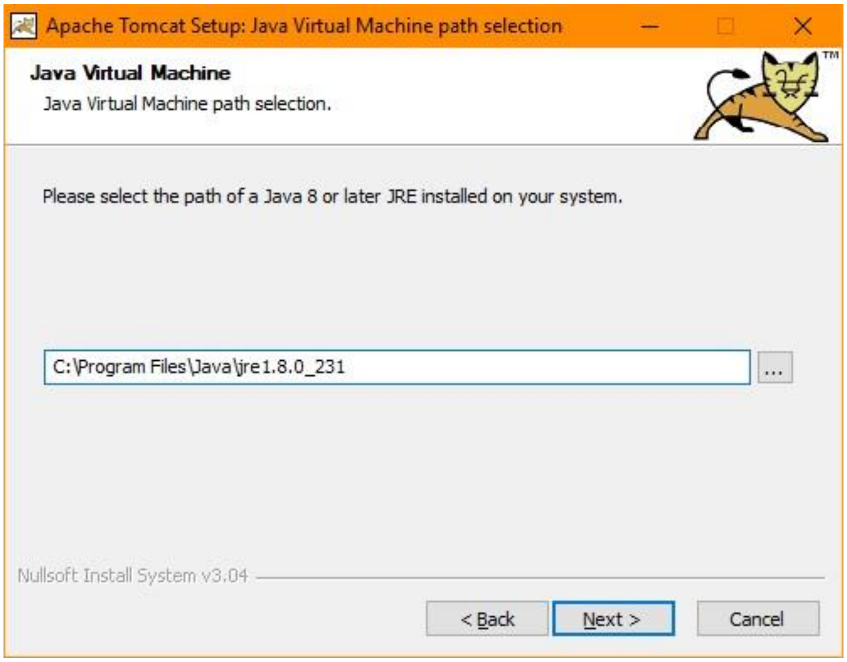
In the next window, you will see the configuration options. You can leave almost everything by default. Just keep in mind that the ports must be free. In addition, add a username and password.


Apache Tomcat Setup: Configuration Options
Configuration
Tomcat basic configuration.
TM

Server Shutdown Port		-1
HTTP/1.1 Connector Port		8080
AJP/1.3 Connector Port		8009
Windows Service Name		Tomcat9
Create shortcuts for all users		□
Tomcat Administrator Login (optional)	User Name	osradar
	Password	••••••••
	Roles	admin-gui,manager-gui

Nullsoft Install System v3.04
< Back
Next >
Cancel

Now select the path where JDK is installed.

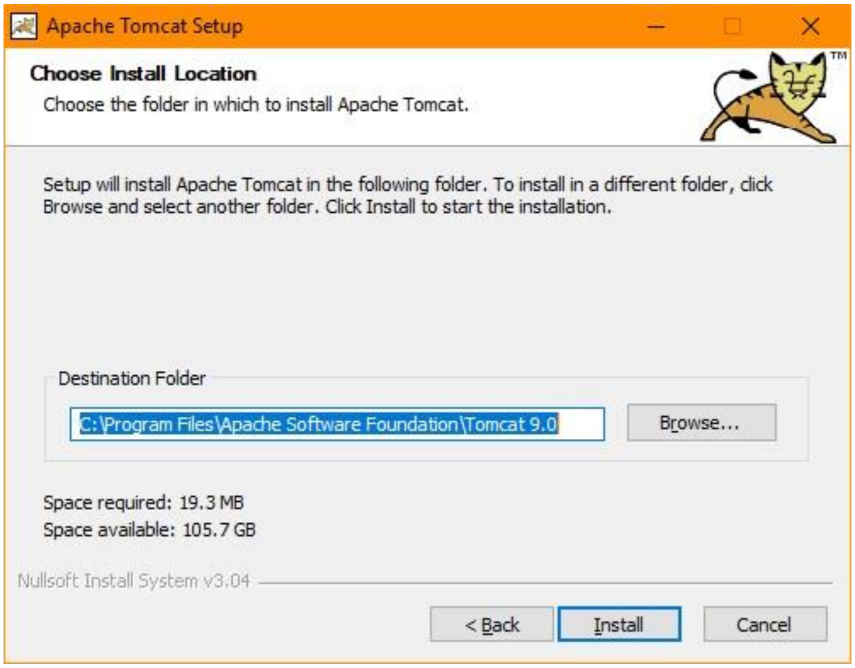

Apache Tomcat Setup: Java Virtual Machine path selection
Java Virtual Machine
Java Virtual Machine path selection.
TM

Please select the path of a Java 8 or later JRE installed on your system.

C:\Program Files\Java\jre1.8.0_231

...
Nullsoft Install System v3.04
< Back
Next >
Cancel

Now set the installation path for Apache Tomcat.



Apache Tomcat Setup

Choose Install Location

Choose the folder in which to install Apache Tomcat.

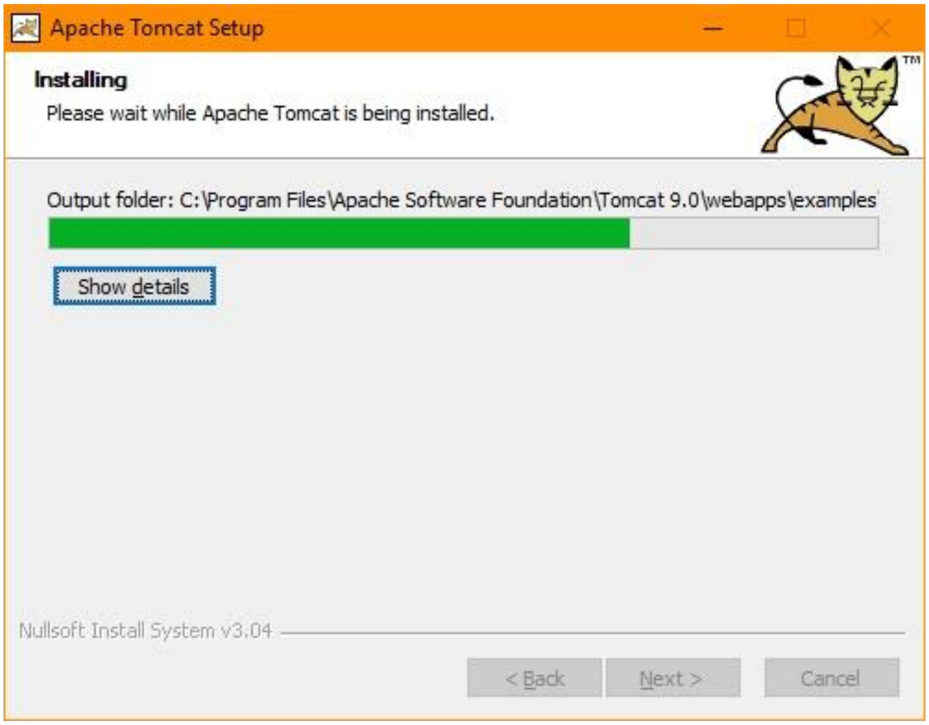
Setup will install Apache Tomcat in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.

Destination Folder: C:\Program Files\Apache Software Foundation\Tomcat 9.0

Space required: 19.3 MB
Space available: 105.7 GB

Nullsoft Install System v3.04

Once all the configurations have been completed, the installation process will begin.



Apache Tomcat Setup

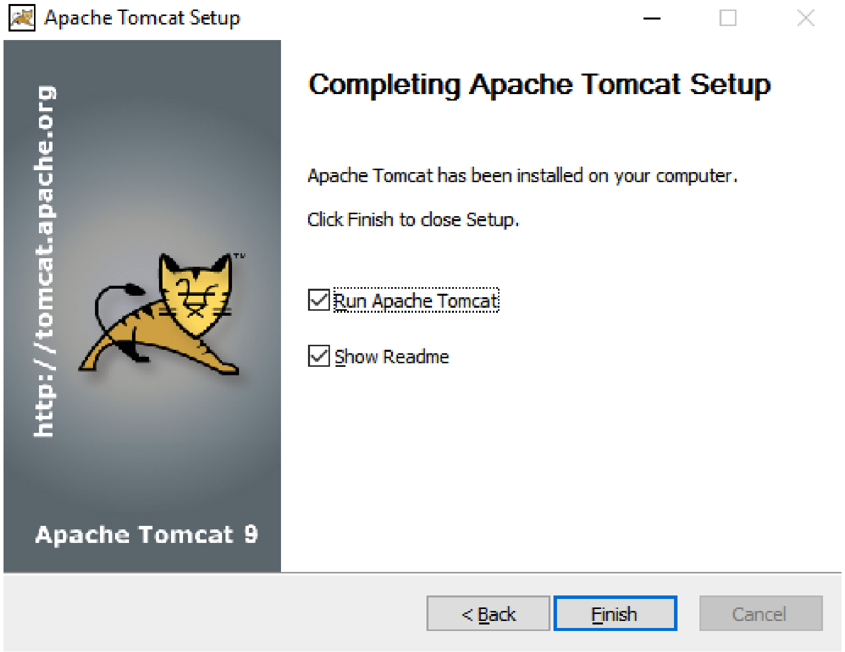
Installing

Please wait while Apache Tomcat is being installed.

Output folder: C:\Program Files\Apache Software Foundation\Tomcat 9.0\webapps\examples

Nullsoft Install System v3.04

Finally, the wizard will have finished its work, and we will have Tomcat installed in the system.



Apache Tomcat Setup

Completing Apache Tomcat Setup

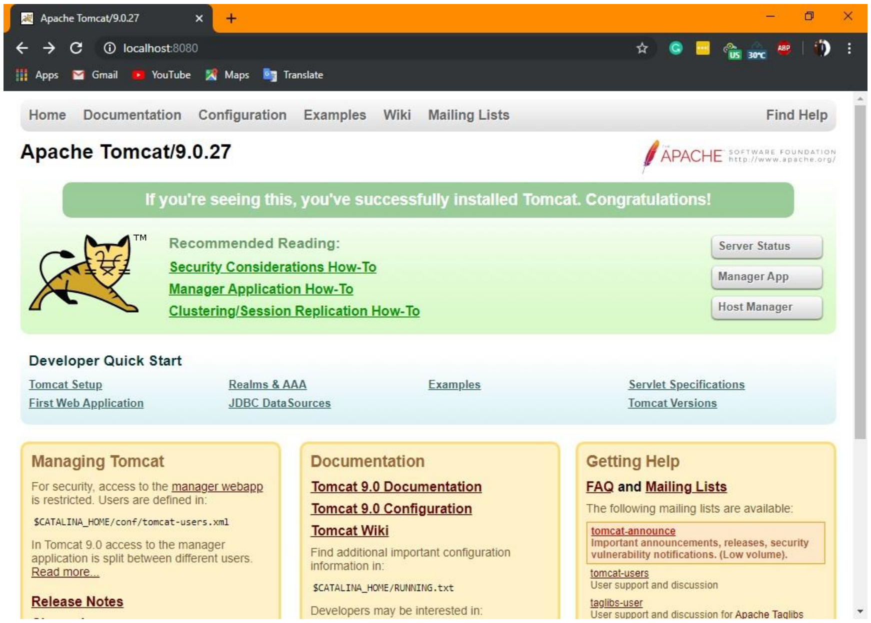
Apache Tomcat has been installed on your computer.

Click Finish to close Setup.

☑ Run Apache Tomcat

☑ Show Readme

Now, to test that the server is properly installed and running, please open a web browser. Then go to this address: **http://localhost:8080/** If you've done everything right, the page should look like this:



Apache Tomcat/9.0.27

If you're seeing this, you've successfully installed Tomcat. Congratulations!

Recommended Reading:
Security Considerations How-To
Manager Application How-To
Clustering/Session Replication How-To

Developer Quick Start

Tomcat Setup
First Web Application
Realms & AAA
JDBC DataSources
Examples
Servlet Specifications
Tomcat Versions

Managing Tomcat

For security, access to the manager webapp is restricted. Users are defined in:

```
$CATALINA_HOME/conf/tomcat-users.xml
```

In Tomcat 9.0 access to the manager application is split between different users. Read more...

Release Notes

Documentation

Tomcat 9.0 Documentation
Tomcat 9.0 Configuration
Tomcat Wiki

Find additional important configuration information in:

```
$CATALINA_HOME/RUNNING.txt
```

Developers may be interested in:

Getting Help

FAQ and Mailing Lists

The following mailing lists are available:

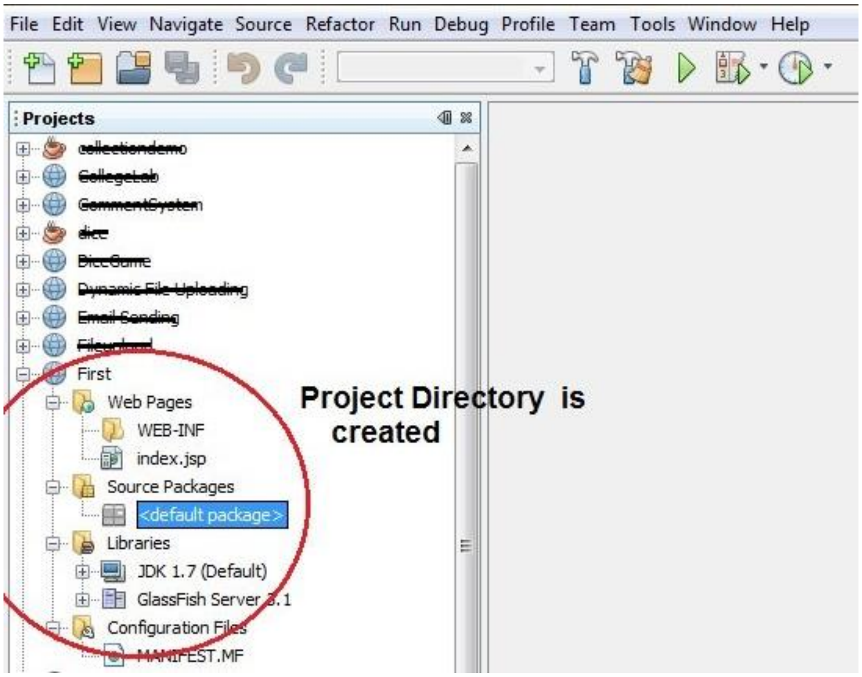
tomcat-announce
Important announcements, releases, security vulnerability notifications. (Low volume).

tomcat-users
User support and discussion

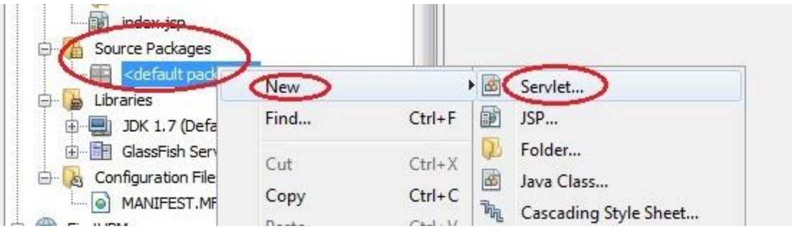
taglibs-user
User support and discussion for Apache Taglibs

2. Create Java Web Project

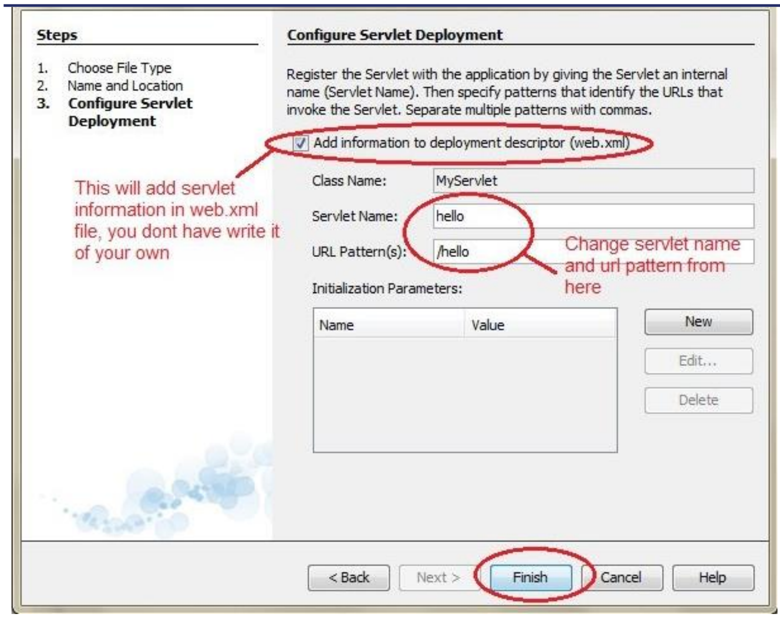
- Open Netbeans IDE, Select File -> New Project
- Select Java with Ant -> Web Application, then click on Next
- Give a name to your project and click on Next
- and then, Click Finish
- The complete directory structure required for the Servlet Application will be created automatically by the IDE.



- To create a Servlet, open Source Package, right click on default packages -> New -> Servlet.



- Give a Name to your Servlet class file like below image.



Steps

1. Choose File Type
2. Name and Location
3. **Configure Servlet Deployment**

Configure Servlet Deployment

Register the Servlet with the application by giving the Servlet an internal name (Servlet Name). Then specify patterns that identify the URLs that invoke the Servlet. Separate multiple patterns with commas.

☑ Add information to deployment descriptor (web.xml)

Class Name: MyServlet

Servlet Name: hello

URL Pattern(s): /hello

Initialization Parameters:

Name	Value

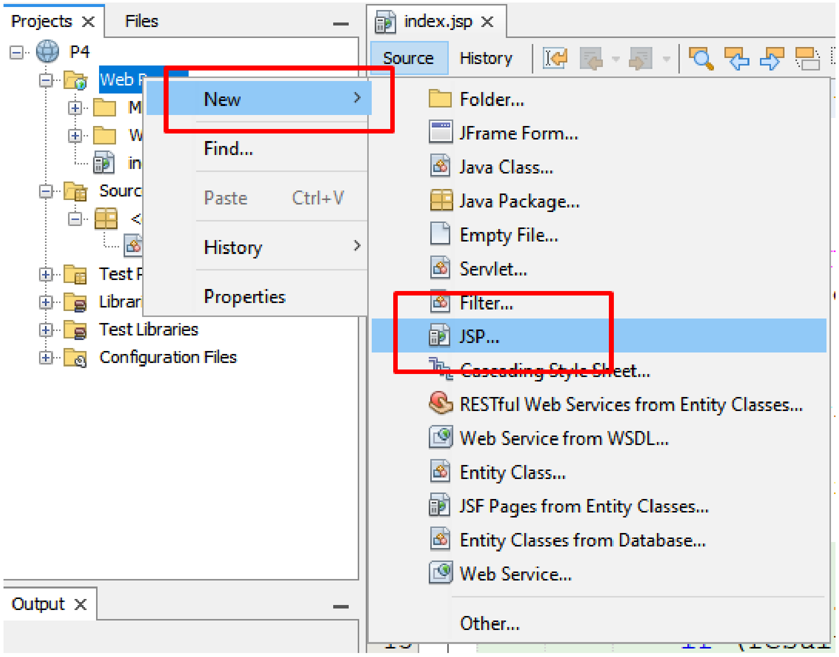
This will add servlet information in web.xml file, you dont have write it of your own

Change servlet name and url pattern from here

- Now, your Servlet class is ready, and you just need to change the method definitions and you will be good to go.

3. **Create a JSP File**

- right click on Web Pages -> New -> JSP



- Give it a name. We recommend you to name it index, because browser will always pick up the index.jsp file automatically from a directory. Index file is read as the first page of the web application.

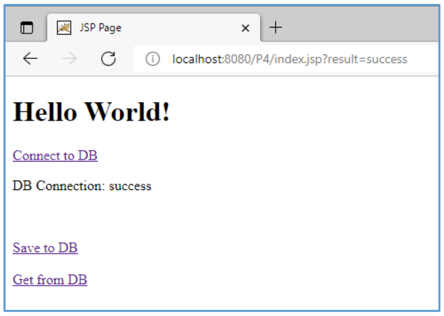
MDTU JAVA Workshop
Worksheet 04

Activity 1

Create a web page similar to the GUI window you created in **practical 3**. Click here is a clickable link “Connect to the DB” and once you click the link, you should be able to connect to the data base successfully. It should then return to the JSP page and display “DB Connection: success”

Activity 2

Add another link to display as “Save to DB”, and once you click the link, you should be able to write to the table successfully. It should then return to the JSP page and display “Successfully saved to the DB”



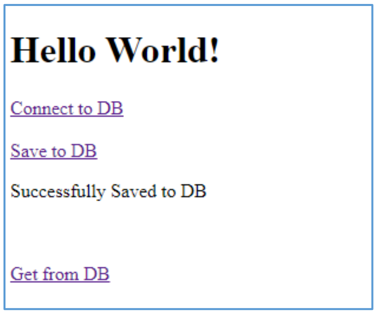
Hello World!

Connect to DB

DB Connection: success

Save to DB

Get from DB



Hello World!

Connect to DB

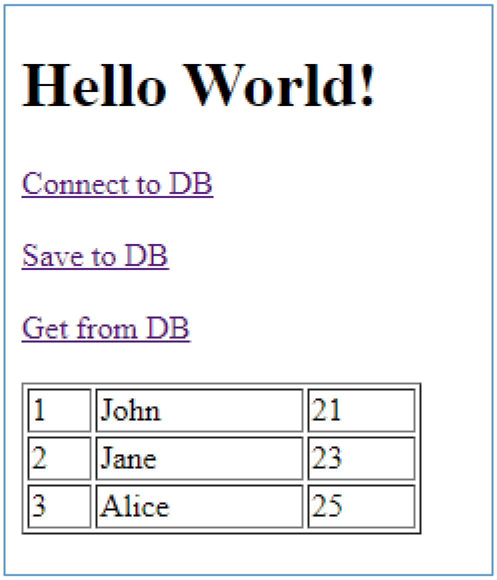
Save to DB

Successfully Saved to DB

Get from DB

Activity 3

Add another link to display as “Get from DB”, and once you click the link, you should be able to read from the table successfully. Records should be display in the web page in a tabular manner.



Hello World!

Connect to DB

Save to DB

Get from DB

1	John	21
2	Jane	23
3	Alice	25