



UNIVERSITI MALAYSIA TERENGGANU
CSM3023 – WEB BASED APPLICATION DEVELOPMENT

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING)
WITH HONORS

LAB 1 – Introduction to Servlet, JSP and MySQL Database

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Task 1:

Objective: Installation of Apache Tomcat and MySQL.

Output:

The image shows two screenshots. The top screenshot is the Apache Tomcat 10 Software Downloads page. It features the Apache Tomcat logo, a search bar, and a sidebar with links to Home, Taglibs, and Maven Plugin. The main content area includes a 'Tomcat 10 Software Downloads' section with a welcome message and links to 'which version?' and 'migration tool'. Below this is a 'Quick Navigation' section with links to KEYS, 10.1.20, Browse, and Archives. The 'Release Integrity' section explains the importance of verifying file integrity using OpenPGP signatures and SHA-512 checksums. The 'Mirrors' section provides a list of mirrors and a dropdown menu to select a mirror. The '10.1.20' section includes a link to the README file. The bottom screenshot is the MySQL Workbench welcome screen. It features a large 'Welcome to MySQL Workbench' title, a description of the tool, and links to 'Browse Documentation >', 'Read the Blog >', and 'Discuss on the Forums >'. Below these links is a 'MySQL Connections' section with a search icon and two connection cards: 'Local instance MySQL80' and 'DBConnection'. The 'Local instance MySQL80' card shows a user 'root' and a host 'localhost:3307'. The 'DBConnection' card shows a user 'root' and a host '127.0.0.1:3307'.

Apache Tomcat®

Tomcat 10 Software Downloads

Welcome to the Apache Tomcat® 10.x software download page. This page provides download links for obtaining the latest version of Tomcat 10.1.x software, as well as links to the archives of older releases.

Unsure which version you need? Specification versions implemented, minimum Java version required and lots more useful information may be found on the ["which version?"](#) page.

Users of Tomcat 10 onwards should be aware that, as a result of the move from Java EE to Jakarta EE as part of the transfer of Java EE to the Eclipse Foundation, the primary package for all implemented APIs has changed from `javax.*` to `jakarta.*`. This will almost certainly require code changes to enable applications to migrate from Tomcat 9 and earlier to Tomcat 10 and later. A [migration tool](#) has been developed to aid this process.

Quick Navigation

[KEYS](#) | [10.1.20](#) | [Browse](#) | [Archives](#)

Release Integrity

You **must** [verify](#) the integrity of the downloaded files. We provide OpenPGP signatures for every release file. This signature should be matched against the [KEYS](#) file which contains the OpenPGP keys of Tomcat's Release Managers. We also provide [SHA-512](#) checksums for every release file. After you download the file, you should calculate a checksum for your download, and make sure it is the same as ours.

Mirrors

You are currently using <https://dldn.apache.org/>. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are *backup* mirrors (at the end of the mirrors list) that should be available.

Other mirrors: [Change](#)

10.1.20

Please see the [README](#) file for packaging information. It explains what every distribution contains.

Binary Distributions

Welcome to MySQL Workbench

MySQL Workbench is the official graphical user interface (GUI) tool for MySQL. It allows you to design, create and browse your database schemas, work with database objects and insert data as well as design and run SQL queries to work with stored data. You can also migrate schemas and data from other database vendors to your MySQL database.

[Browse Documentation >](#) [Read the Blog >](#) [Discuss on the Forums >](#)

MySQL Connections 🔍

Local instance MySQL80

root
localhost:3307

DBConnection

root
127.0.0.1:3307

Reflection:

From this exercise, I learnt how to install Apache Tomcat and MySQL in my device.

Task 2:

Objective: Change the root password of MySQL Database

Output:

```
Setting environment for using XAMPP for Windows.
amirf@AMIR c:\xampp
# mysqladmin --user=root password "admin"

amirf@AMIR c:\xampp
# mysql --user=root --password=admin -e "SELECT 1+1"
+-----+
| 1+1 |
+-----+
|    2 |
+-----+

amirf@AMIR c:\xampp
# |
```

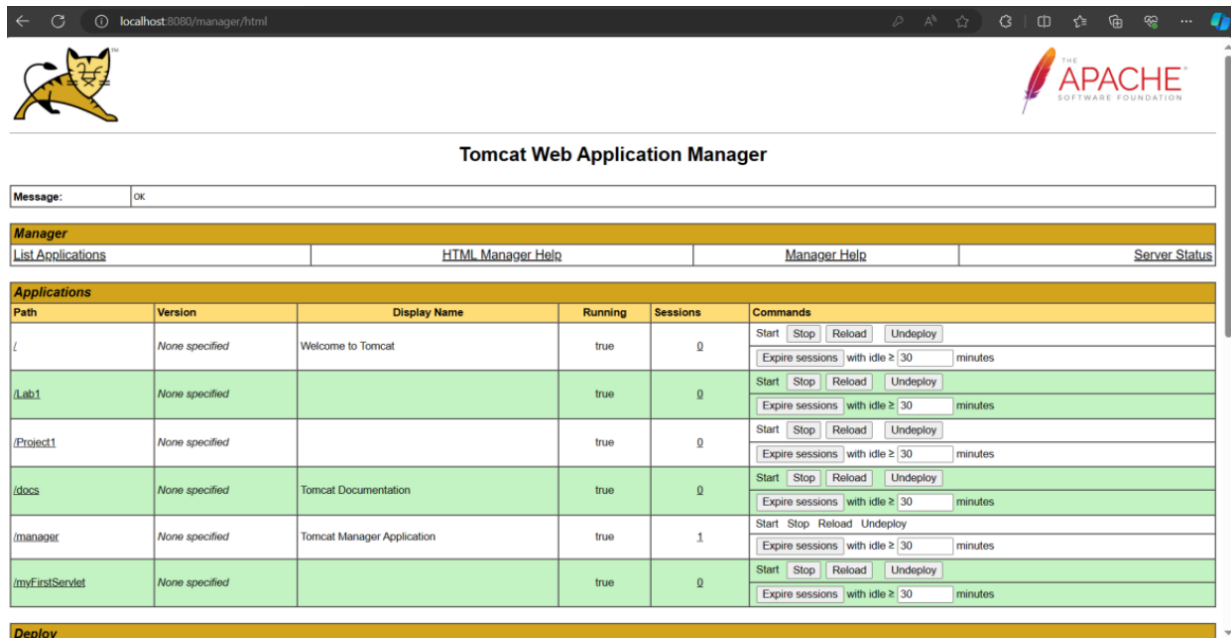
Reflection:

From this exercise, I learnt how to access MySQL using command prompt. While graphical user interfaces (GUIs) exist for managing MySQL, knowing how to access it through the command prompt offers several advantages.

Task 3:

Objective: Testing the access and add a new user to Apache Tomcat

Output:



The screenshot shows the Tomcat Web Application Manager interface in a web browser. The browser's address bar shows the URL `localhost:8080/manager/html`. The page features the Tomcat logo on the left and the Apache Software Foundation logo on the right. Below the logos, the title "Tomcat Web Application Manager" is centered. A message box at the top indicates a successful operation with the text "Message: OK".

The main content area is divided into several sections. The "Manager" section includes links for "List Applications", "HTML Manager Help", "Manager Help", and "Server Status". The "Applications" section displays a table of running applications, each with a set of control buttons (Start, Stop, Reload, Undeploy) and an "Expire sessions" option.

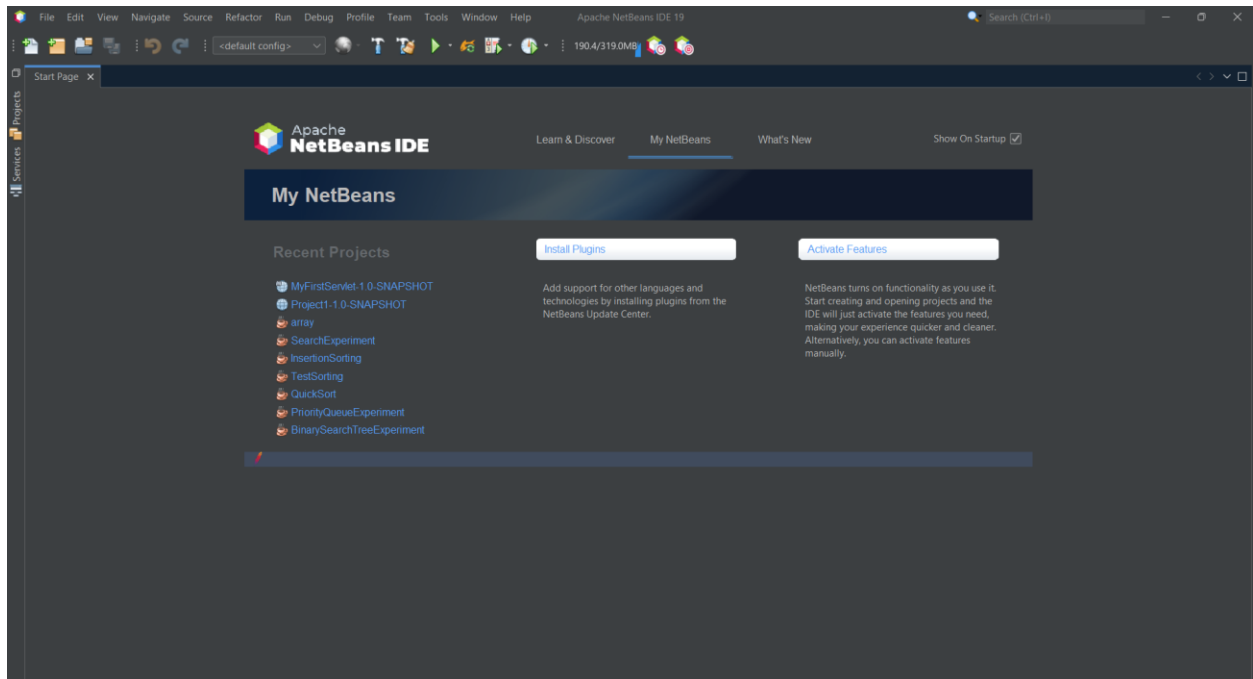
Path	Version	Display Name	Running	Sessions	Commands
/	None specified	Welcome to Tomcat	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/lab1	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/Project1	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/docs	None specified	Tomcat Documentation	true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/manager	None specified	Tomcat Manager Application	true	1	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes
/myFirstServlet	None specified		true	0	Start Stop Reload Undeploy Expire sessions with idle ≥ 30 minutes

The "Deploy" section is partially visible at the bottom of the page.

Task 4:

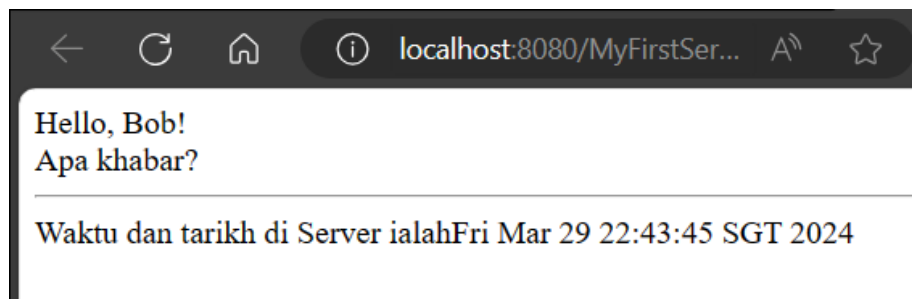
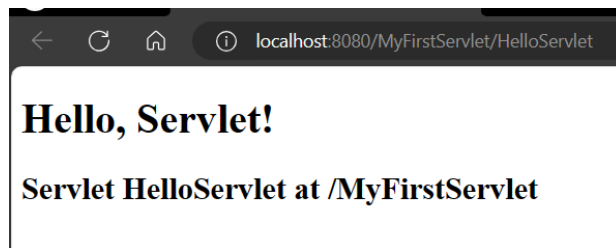
Objective: To setup a proper environment for Java Web Application development.

Output:



Task 5:

Objective: To write a simple Java Servlet.



Reflection:

It is the same output because the same method `processRequest()` was recalled.

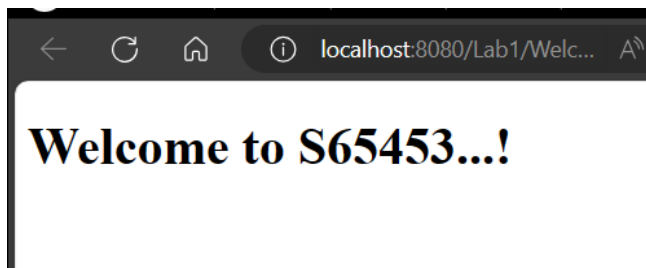
Task 6:

Objective: Writing a simple plain JSP program.

Code:

```
1 <%--  
2 Document : Welcome  
3 Created on : Mar 30, 2024, 12:57:54 PM  
4 Author : amirf  
5 --%>  
6  
7 <%@page contentType="text/html" pageEncoding="UTF-8"%>  
8 <!DOCTYPE html>  
9 <html>  
10 <head>  
11 <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">  
12 <title>S65453 - Web Programming 2</title>  
13 </head>  
14 <body>  
15 <h1>Welcome to S65453...!</h1>  
16 </body>  
17 </html>  
18
```

Output:



1. From this exercise I learnt how to set up a JSP program in NetBeans using Apache Tomcat server.
2. JSP files are essentially HTML files with Java code embedded within them. They use special tags, such as '`<% %>`' or '`<%= %>`', to delimit Java code segments withing the HTML markup.
3. Servlets are written entirely in Java, with HTML or other content generated programmatically within the Java code while JSP files contain a mixture of HTML

markup and Java code. Java code can be embedded within '`<% %>`' tags or expressions can be included within '`<%= %>`' tags for inline output.

Task 7:

Objective: Display the current date, perform auto refresh header in JSP's page.

Output:

Display Current Date and perform auto refresh header.

Current date and time is Sat Mar 30 13:21:53 SGT 2024

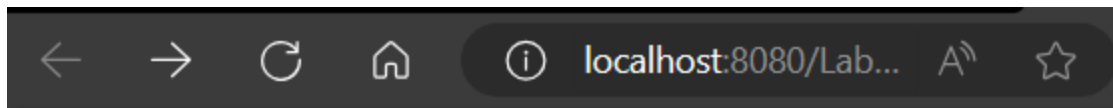
Reflection:

1. From this exercise, I learnt how to use `<% %>` tags which is scriptlet tag used to embed Java code within the HTML content of JSP file. We can insert Java code in HTML by using scriptlet tag.
2. Java Scriptlet is a block of Java code slipped directly between speech tags in a JSP page.
3. We can use scriptlets, expressions, declarations and directives to accomplish it.

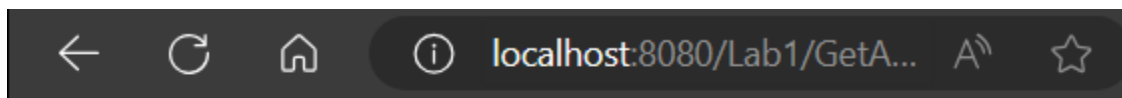
Task 8:

Objective: Using Session object, perform simple Mathematics operations in JSP's page.

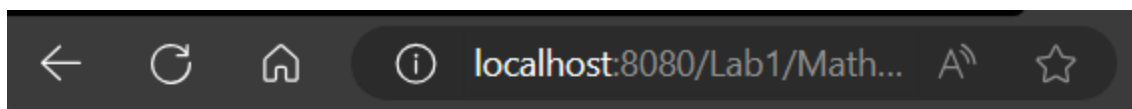
Output:



[Click here to get user name](#)
[Results of mathematics operations](#)



User Name is: Fouad Abdulameer



Addition num1 and num2 is 35

Multiplication num1 and num2 is 250

Square root of 25 is 5.00

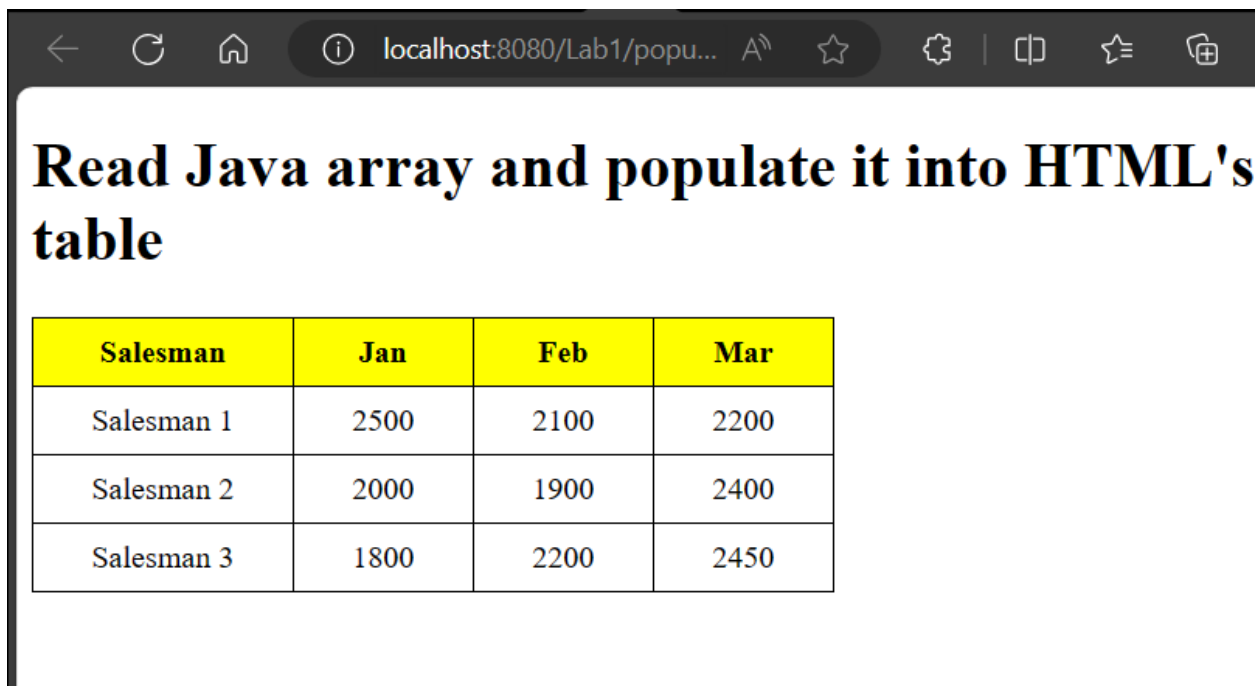
Reflection:

1. By using href attributes.
2. It will show null

Task 9:

Objective: Read Java array and populate it into HTML's table.

Ouput:

A screenshot of a web browser window. The address bar shows 'localhost:8080/Lab1/popu...'. The page title is 'Read Java array and populate it into HTML's table'. Below the title is a table with 4 columns: 'Salesman', 'Jan', 'Feb', and 'Mar'. The table contains 3 rows of data for Salesman 1, Salesman 2, and Salesman 3.

Salesman	Jan	Feb	Mar
Salesman 1	2500	2100	2200
Salesman 2	2000	1900	2400
Salesman 3	1800	2200	2450

Reflections:

1. `datatype[][] arrayName = new datatype[row][columns];`

- 2.

- Create a new JSP file and name it as useJavaObject.
 - Import java.util.Date.
 - Create Date object and display the current date and time.
 - Use setInterval() to trigger refresh function and set the autoloading time to 5 seconds.
 - Compile and run the program.
3. HTML standing for Hypertext Markup Language is a kind of webpage where the content and structure are static, which is often perfect or fast to display regular content on the web. Furthermore, the improvement of JSP (JavaServer Pages) pages is dynamic web pages, which can contain both HTML as well as Java program. In contrast to JSP pages that embed java code inside of an HTML markup, HTML pages allow only a static presentation of content that can be generated using HTML code alone. JSP pages firstly go through the run-time processing from one of the most widely used server-side engines, in which the Java code is interpreted and then executed to create the dynamic HTML content based on the results of the calculation. This enables the development of interactive and data-driven web apps with the capability to fetch data from different sources and tailor the content based on the requested information. Apart from it, it offers the functionalities that are not restricted to the custom tags, but it provides easier interface with Java servlets as well as other backend technology and helps better separate the presentations and business logic.

Exercise 1:

Objective: to convert a Java program into Web-Based application.

Output:



Area Result

The area of the circle with radius 10 is 314.16.