AUTOMATED SOFTWARE TESTING
(502072)

Lab 10 – Performance Testing with JMeter
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1. **GOALS:** This lab helps students to
   - Practise performance testing.
   - Be able to write test cases with JMeter.
   - Understand various functionalities of JMeter.
   - Be able to work with APIs interms of performance.
2. **OBJECTIVES**
   - Install automated testing environment with Jmeter.
   - Install web drivers.
   - Write and execute test cases.
   - Work with APIs about performance.
3. **CONTENT**

3.1 PREREQUISITES

System requirement

JDK/OpenJDK: >= 1.7

Dowload JMeter here

Extract and remember that do not change any of the sub-directory names.

Run Jmeter

OS	Output (under bin directory)
Windows	jmeter.bat
Linux	jmeter.sh
MacOS	jmeter.sh

3.2 THEORY

Student must review the theory of testing which are presented in the previous labs.

3.3 JMETER

jMeter is an Open Source testing software. It is 100% pure Java application for load and performance testing.

jMeter is designed to cover various categories of tests such as load testing, functional testing, performance testing, regression testing, etc.

JMeter is a Java desktop application with a graphical interface that uses the Swing graphical API. It can therefore run on any environment / workstation that accepts a Java virtual machine, for example − Windows, Linux, Mac, etc.

Performance Test − This test sets the best possible performance expectation under a given configuration of infrastructure. It also highlights early in the testing process if any changes need to be made before the application goes into production.

Load Test − This test is basically used for testing the system under the top load it was designed to operate under.

Stress Test − This test is an attempt to break the system by overwhelming its resources.

Refer to **here** for more details about Jmeter.

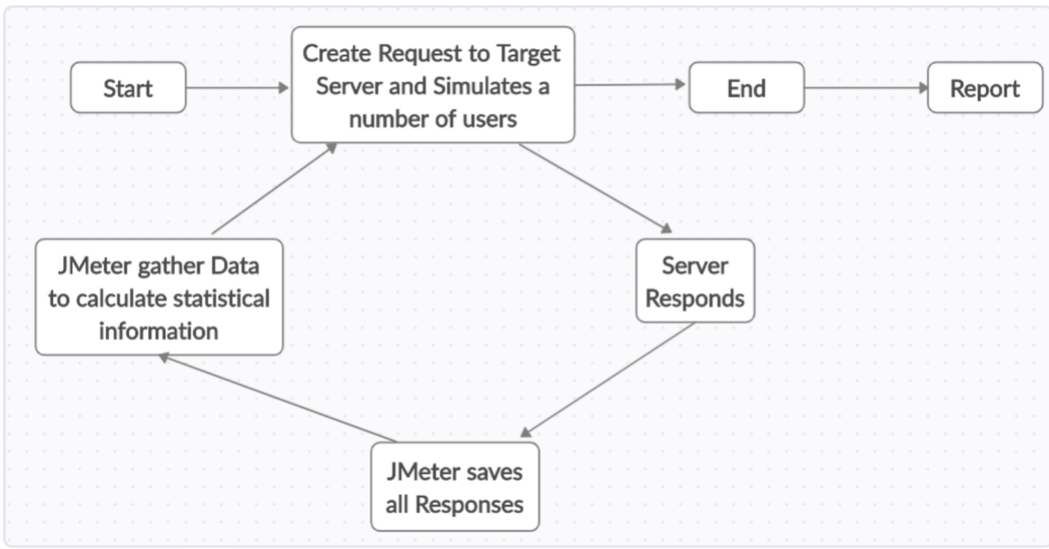

Figure 1 – Jmeter working flow

3.4 PRACTICE

Assignment 1

- **Using Jmeter to analyze the load of [1..100] sessions logging in at the same time.**

  1/ Create a dataset with CSV format corresponding to the list of users provided in https://www.saucedemo.com

Accepted usernames are:	Password for all users:
standard_user	secret_sauce
locked_out_user	
problem_user	
performance_glitch_user	
error_user	
visual_user	

  2/ Use CSV Data Set Config to configure [0..100] user sessions.

  3/ Analyze results (throughput, errors, std.dev, average…). Refer to the below instruction link to setup. View the results in **View Results Tree, Graph Results, and Summary Report.**

  https://jmeter.apache.org/usermanual/jmeter_proxy_step_by_step.html

  https://www.blazemeter.com/blog/jmeter-tutorial

Assignment 2

- **Using Jmeter to analyze the load of 100 users searching simultaneously.**

  1/ Get API from: https://open-meteo.com/en/docs

  2/ Create a CSV dataset with 12 districts (district 1 – district 12) in HCMC with latitude and longitude.

  3/ Use CSV Data Set Config to configure [0..100] users searching the weather information of those 12 districts simultaneously.

  4/ Analyze results (throughput, errors, std.dev, average…). Refer to the below instruction link to setup. View the results in **View Results Tree, Graph Results, and Summary Report.**

Assignment 3

- **Using Jmeter to capture actions**

  Refer to the instruction to record request testing

  Instruction: https://jmetervn.com/2016/11/05/recording-tests-with-jmeter/

  1/ Go to https://open-meteo.com/en/docs

  2/ Search "Quan 10" to get its weather data.

  3/ Click "reload" in the "Chart and URL" at API Response to update the latest data.

  4/ Stop recording, check the steps recorded, and then playback.

  5/ Analyze pass/fail requests.

4. REFERENCES

[1] Daich, G., Price, G., Ragland, B., Dawood, M. "Software Test Technologies Report." STSC, Hill Air Force Base, Utah, August 1994.

[2] https://jmeter.apache.org/usermanual/index.html

[3] https://jmetervn.com/2016/11/05/recording-tests-with-jmeter/

5. REVISION HISTORY

Revision	Date	Author(s)	Description
1.0	Dec 2023	Nguyen Thanh Quan (MSc)	Created
1.1	April 2024	Nguyen Thanh Quan (MSc)	Updated JMeter