Assignment - 4

1. Which components have you used in Load Runner?

Virtual Generator

Used to create and record scripts that simulate real user actions on the application.

-> Scripts are written in languages like C, Java, or JavaScript.

Controller

Used to design, configure, and execute load tests.

-> Manages how many virtual users will run, for how long, and from which machines.

-> Controls load distribution and test scheduling.

Load Generators

These are machines that generate the actual load (Vusers) during the test.

-> They simulate multiple users accessing the application at the same time.

Analysis

Used to analyze and interpret the test results after execution.

-> Provides detailed reports, graphs, and metrics like response time, throughput, error rate, etc.

Monitoring

Used to monitor server and network performance during test execution.

-> Tracks CPU usage, memory, disk I/O, database performance, and more.

2. How can you set the number of Vusers in Load Runner?

Open the LoadRunner Controller

After creating the script in VuGen, go to the Controller to design the load test.

Add Your Test Script

Click “Add Script” and select your VuGen script

Go to “Vusers” or “Groups” Section

Each script appears as a Vuser Group.
Here you can define how many virtual users will run for that script.

Set the Number of Vusers

Select the Vuser group.

Start the Scenario

Click “Run” to start the load test with the set number of Vusers.

3. What is Correlation?

Correlation is a process in performance testing where dynamic values returned by the server are captured and replaced in the script, so the script can run correctly with multiple users.

4. What is the process for developing a Vuser Script?

1. Recording the Script

-> Open VuGen (Vuser Generator).
-> Select the appropriate protocol (Web/HTTP)
-> Click Record and perform the business flow in the application.

2. Enhancing the Script

-> After recording, enhance the script to make it realistic:

a) Parameterization

-> Replace hard-coded values (username, search data, etc.) with parameters. Allows multiple users to run with different data.

b) Correlation

-> Identify and manage dynamic server values (Session ID, tokens).
-> Use correlation functions so the script doesn't fail during replay.

c) Insert Transactions

->Add transaction names around important steps to measure response times.

3. Script Replay & Debugging

-> Run the script in VuGen.
-> Fix errors such as:
    Dynamic value issues
    Missing headers
    Wrong parameters
-> Ensure the script runs successfully without manual intervention.

4. Adding Think Time

-> Add delays between user actions to simulate real user behavior.

5. Runtime Settings Configuration

-> Set pacing, logging, browser settings, timeouts, and other execution rules.

6. Save and Upload to Controller

-> Once the script runs smoothly, save it.

-> Upload/import it into the LoadRunner Controller for load execution.

5. How Load Runner interacts with the application?

-> LoadRunner interacts with the application by simulating virtual users (Vusers) that send requests to the server through recorded scripts, just like real users.

-> It captures the server's responses to measure performance under load.

6. How many VUsers are required for load testing?

-> The number of VUsers required for load testing is based on the expected concurrent users of the application.
-> Usually, the VUser count equals the real-world peak load defined in business or performance requirements.

7. What isthe relationship between Response Time and Throughput?

-> When response time increases, throughput usually decreases.
-> When the system processes more requests per second (high throughput), it may slow down, increasing response time.
-> There is a point where both response time is low and throughput is high; beyond this, performance degrades.
-> When the system hits maximum capacity, response time increases sharply and throughput levels off or drops.
-> It indicates how fast the system responds to a request.
-> It shows how many requests the system can handle per second/minute.
-> CPU, memory, network bandwidth affect both response time and throughput.
-> Even if throughput is high, long response times result in a bad user experience.
-> This leads to failed transactions, reducing overall throughput.

8. To test the Performance testing on "Tops Technologies website" :- https://www.saucedemo.com/

1. to Record all top level menu
2. to Record minimum 10 Vuser on this website
3. save all (Script,Design,Graph)

Record All Top-Level Menu

Open LoadRunner VuGen (Vuser Generator).
Click New Script → Web – HTTP/HTML protocol.
Enter the website URL:
https://www.saucedemo.com/
Click Start Recording.
Perform all top-level actions on the website:
Login
Navigate to:
- Products
- Add to Cart
- Cart Page
- Menu (Left side) → All Items, About, Logout

Stop recording.
Save the script as:
"SauceDemo_TopMenu"

Record Minimum 10 VUsers on This Website

Open LoadRunner Controller.
Click Create New Scenario.
Add your script:
SauceDemo_TopMenu
Set Number of VUsers = 10
- Go to VUser Groups
- Set “Vusers to Run” = 10

Set Ramp-Up
- 2 VUsers every 10 seconds

Set Duration
- run for 5 minutes.

Click Run Scenario.
Wait until all 10 Vusers complete the execution.

Save All (Script, Design, Graph)

A. Save Script

-> In VuGen → File → Save Script
-> Folder name: SauceDemo_Script

B. Save Design (Controller File)

In Controller
→ File → Save Scenario
File saved as: .lrs (LoadRunner Scenario)

C. Save Results / Graphs

-> After test execution, results open in Analysis.
-> Click File → Save As
-> Save the Graphs + HTML report.

Graphs you will get:

Response Time
Throughput
Hits/sec
Running VUsers
Transactions Summary

9. create a normal script of above website with correlate using hp default website.

```
Action()

{

// Start Transaction for Home Page

 lr_start_transaction("Launch_URL");

        web_reg_save_param_ex(

        "ParamName=sessionToken",

        "LB=authentication_token\":\"",
```

```
            "RB=\"",
             "Ordinal=1",
            SEARCH_FILTERS,
            "Scope=Body",
             "IgnoreRedirections=No",
                    LAST);
web_url("saucedemo_home",
            "URL=https://www.saucedemo.com/",
            "Resource=0",
             "RecContentType=text/html",
            "Referer=",
            "Mode=HTML",
             LAST);
 lr_end_transaction("Launch_URL", LR_AUTO);
 lr_output_message("Captured Session Token: %sessionToken%");
           // Login Transaction
            lr_start_transaction("Login");
web_submit_data("login",
        "Action=https://www.saucedemo.com/v1/login",
        "Method=POST",
        "RecContentType=application/json",
        "Referer=https://www.saucedemo.com/",
        "Mode=HTML",
```

```
        ITEMDATA,
        "Name=username", "Value=standard_user", ENDITEM,
        "Name=password", "Value=secret_sauce", ENDITEM,
        "Name=session", "Value={sessionToken}", ENDITEM,
        LAST);
  lr_end_transaction("Login", LR_AUTO);
  // Browse Products
lr_start_transaction("Open_Products_Page");
 web_url("products",
        "URL=https://www.saucedemo.com/inventory.html",
        "Resource=0",
        "RecContentType=text/html",
        "Referer=https://www.saucedemo.com/",
        "Mode=HTML",
        LAST);
lr_end_transaction("Open_Products_Page", LR_AUTO);
// Add To Cart
 lr_start_transaction("AddToCart");
web_url("add_to_cart",
        "URL=https://www.saucedemo.com/cart.html",
        "Resource=0",
        "RecContentType=text/html",
        "Referer=https://www.saucedemo.com/inventory.html",
```

```
        "Mode=HTML",
        LAST);
 lr_end_transaction("AddToCart", LR_AUTO);
// Logout
lr_start_transaction("Logout");
web_url("logout",
        "URL=https://www.saucedemo.com/logout",
        "Resource=0",
        "RecContentType=text/html",
        "Referer=https://www.saucedemo.com/inventory.html",
        "Mode=HTML",
        LAST);
lr_end_transaction("Logout", LR_AUTO);
  return 0;
}
```

10. What is Automation Testing?

-> Automation Testing is a software testing process where test cases are executed automatically using tools or scripts instead of performing them manually, to improve speed, accuracy, and efficiency.

11. Which Are The Browsers Supported By Selenium Ide?

-> Selenium IDE primarily supports the following browsers as extensions.

1. Mozilla Firefox (originally the first supported browser)

2. Google Chrome (supported via official Selenium IDE extension)

12. What are the benefits of Automation Testing?

-> Automated scripts run much faster than manual testing.

-> More test cases and scenarios can be executed in less time.
-> Once created, test scripts can be reused across builds and versions.
-> Eliminates human errors caused by manual testing.
-> Automation integrates with CI/CD tools (Jenkins, GitHub Actions) for continuous testing.
-> Reduces long-term testing effort and overall project cost.
-> Tools can simulate thousands of users, which is impossible manually.
-> Tools automatically generate detailed test reports and logs.
-> Quick execution of repeated test cases after every code change.

13. What are the advantages of Selenium?

-> No license cost.
-> Supports Chrome, Firefox, Edge, Safari,
-> Works on Windows, Mac, and Linux.
-> Java, Python, C#, JavaScript, Ruby,

-> Jenkins, Maven, TestNG, JUnit, Docker, CI/CD pipelines.
-> Faster testing using Selenium Grid.
-> Easy to find help, tutorials, and solutions.

14. Why testers should opt for Selenium and not QTP?

Selenium is Free, QTP/UFT is Paid

-> Selenium is open-source with zero cost.
-> QTP requires expensive licenses.

Supports More Browsers

-> Selenium works with Chrome, Firefox, Edge, Safari, Opera.
-> QTP mainly supports Internet Explorer and limited browsers.

Cross-Platform Support

-> Selenium runs on Windows, Mac, Linux.
-> QTP works only on Windows.

Supports Multiple Programming Languages

-> Selenium works with Java, Python, C#, JavaScript, Ruby, etc.
-> QTP supports VBScript only.

15. To validate the tops technologies website Contact us page and enter your friend detail at last “Login and sidemenu” https://www.saucedemo.com/

Java

https://github.com/anitpatel1133/ASSIGNMENT/blob/main/Task.java

Side

https://github.com/anitpatel1133/ASSIGNMENT/blob/main/saucedemo.side