T.Y. B.SC. C.S. Sem-V	Roll No: **713**

Date:03/11/2020

Practical no 9

AIM: Load Testing using JMeter.

Theory:-

What is JMeter ?

Apache JMeter may be used to test performance both on static and dynamic resources, Web dynamic applications. It can be used to simulate a heavy load on a server, group of servers, network or object to test its strength or to analyze overall performance under different load types.

1. Thread Group : Thread group elements are the beginning points of any test plan. All controllers and samplers must be under a thread group. Other elements, e.g. Listeners, may be placed directly under the test plan, in which case they will apply to all the thread groups. As the name implies, the thread group element controls the number of threads JMeter will use to execute your test. The controls for a thread group allow you to:

1.1 Number of Threads : Each thread will execute the test plan in its entirety and completely independently of other test threads. Multiple threads are used to simulate concurrent connections to your server application.

1.2 Ramp-up Period : The ramp-up period tells JMeter how long to take to ”ramp-up” to the full number of threads chosen. If 10 threads are used, and the ramp-up period is 100 seconds, then JMeter will take 100 seconds to get all 10 threads up and running. Each thread will start 10 (100/10) seconds after the previous thread was begun. If there are 30 threads and a ramp-up period of 120 seconds, then each successive thread will be delayed by 4 seconds.

1.3 Loops : By default, the thread group is configured to loop once through its elements. However one can change it repeat the tests.

2. Controllers : JMeter has two types of Controllers: Samplers and Logical Controllers. These drive the processing of a test.

2.1 Samplers : Samplers tell JMeter to send requests to a server and wait for a response. They are processed in the order they appear in the tree. Controllers can be used to modify the number of repetitions of a sampler. ”HTTP Request” is one of those samplers which we use to interact with HTTP protocol to our server.

2.2 Logic Controllers : Logic Controllers let you customize the logic that JMeter uses to decide when to send requests. Logic Controllers can change the order of requests coming from their child elements. They can modify the requests themselves, cause JMeter to repeat requests, etc

3. Listeners : Listeners provide access to the information JMeter gathers about the test cases while JMeter runs. The Graph Results listener plots the response times on a graph. The ”View Results Tree” Listener shows details of sampler requests and responses, and can display basic HTML and XML representations of the response. Other listeners provide summary or aggregation information.

3.1 Results Tree : The View Results Tree shows a tree of all sample responses, allowing you to view the response for any sample. In addition to showing the response, you can see the time it took to get this response, and some response codes. Note that the Request panel only shows the headers added by JMeter. It does not show any headers (such as Host) that may be added by the HTTP protocol implementation.

3.2 Graph Results : The Graph Results listener generates a simple graph that plots all sample times. Along the bottom of the graph, the current sample (black), the current average of all samples (blue), the current standard deviation (red), and the current throughput rate (green) are displayed in milliseconds.

Pre-Installation Requirements

JDK/JRE Installation is required(Java 8 or higher)

Running the batch file may not work directly so one needs to add path of the java bin folder through the terminal and then try running the batch file.

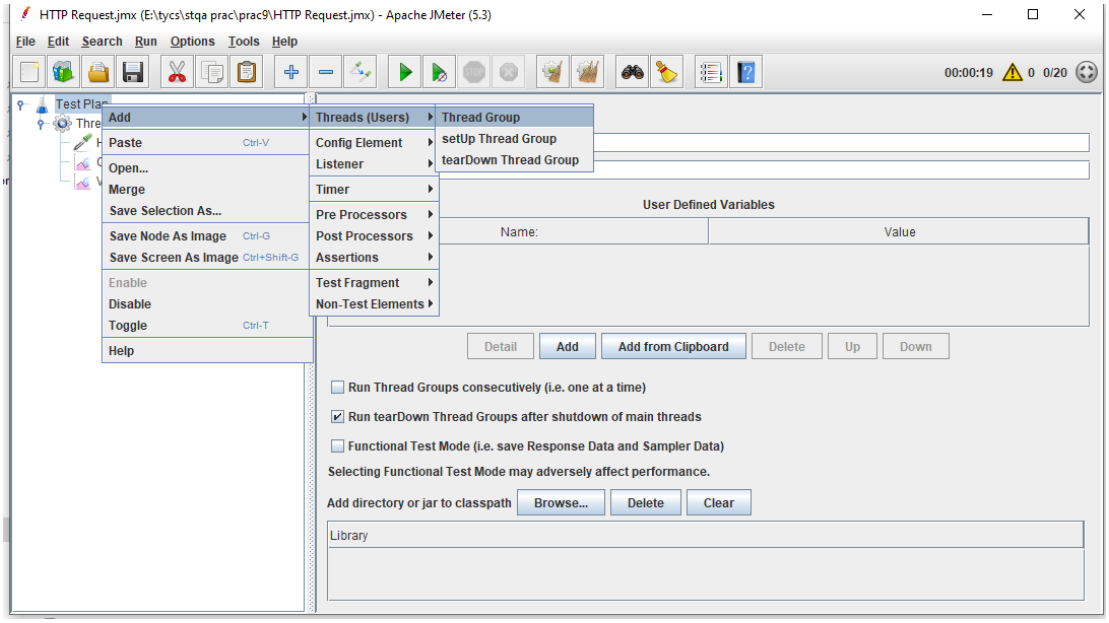
For Linux use OpenJDK package(latest available) and mark the jar file as executable through file properties or use chmod to set execution permission.

Steps:

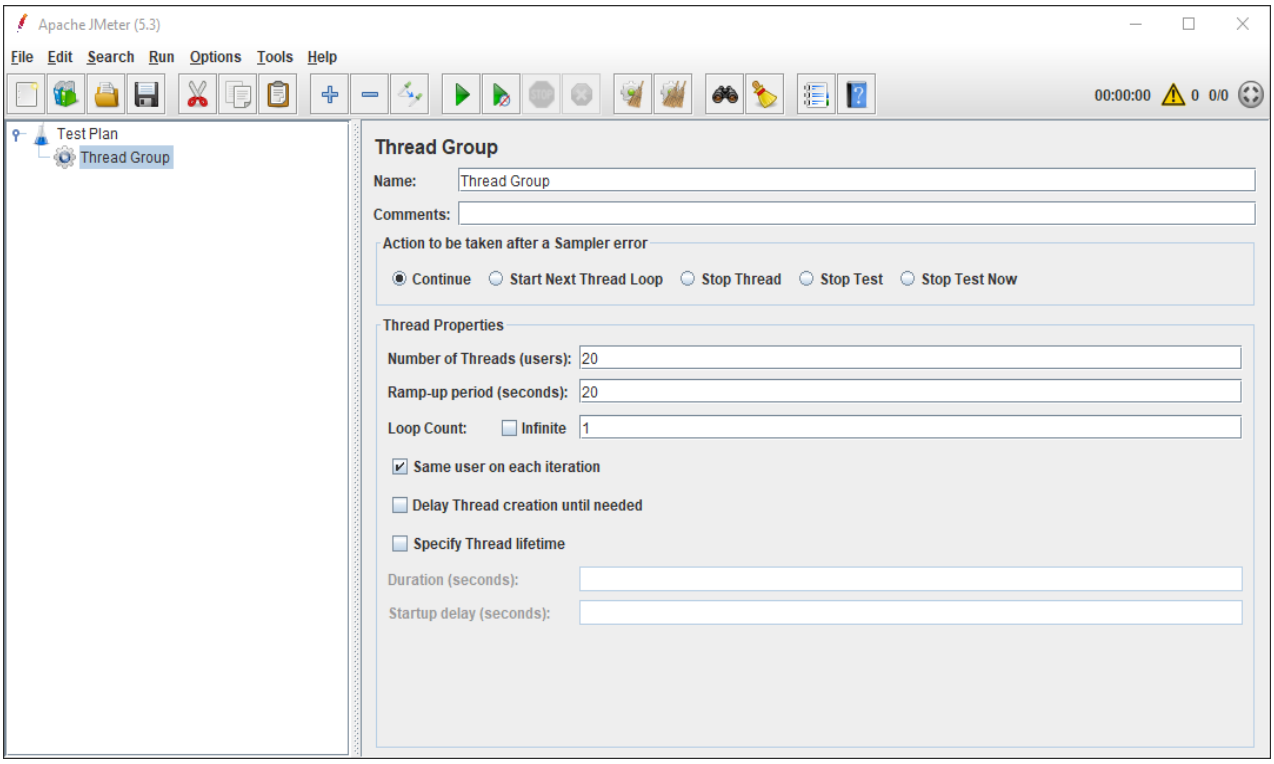
Step-1 :- Download and Unzip Jmeter package from Apache Website.
https://jmeter.apache.org/download_jmeter.cgi

Step-2 :- Navigate to bin folder and run the ”ApacheJMeter.jar” or ”jmeter.bat” file and it will launch a window. In case of error/failure refer the Pre-Installation Requirements.

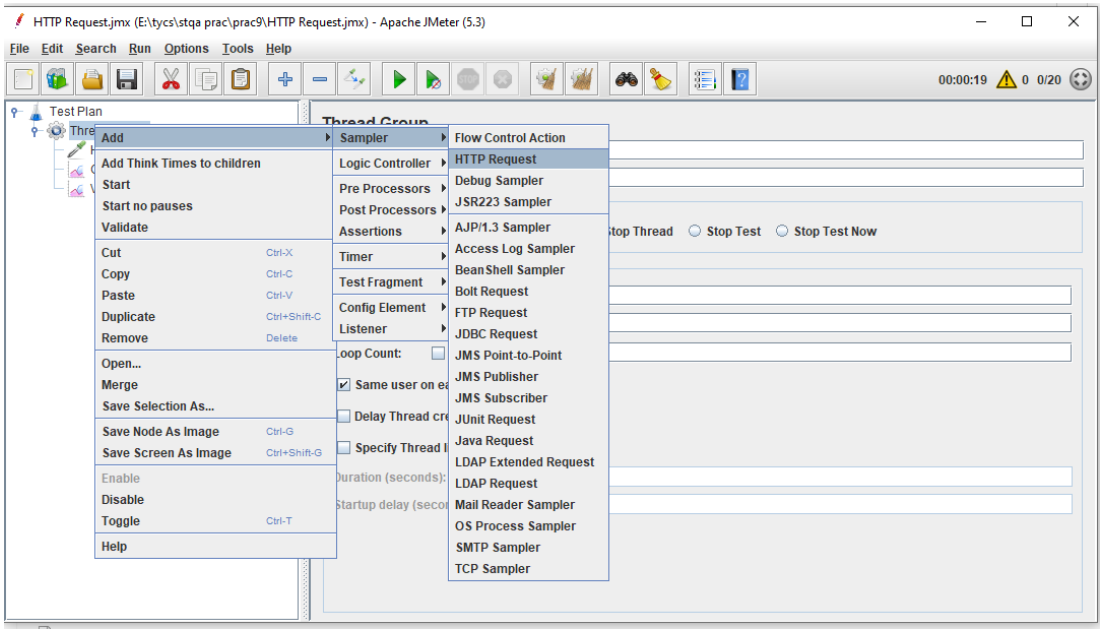
Step-3 :- Now First step is to add an Thread Group, RightclickonT estPlan → Add → T hreads(Users) → T hreadGroup



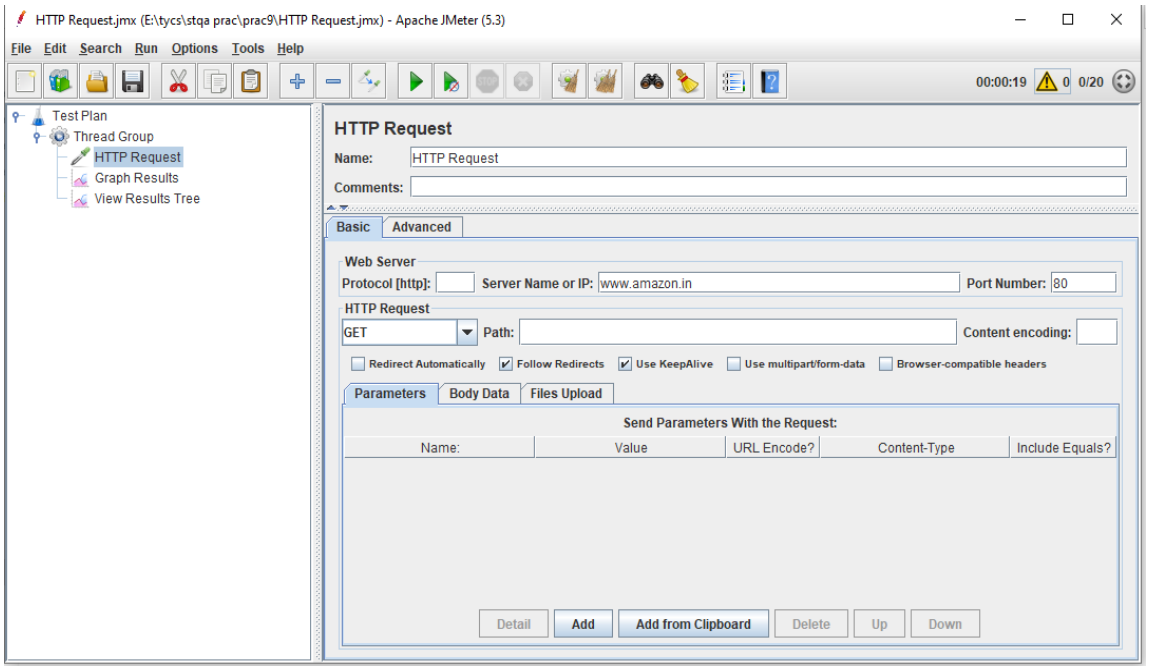
Step-4 :- Next rename the Thread Group and set ”Number of Threads (Users):” as 20 and ”Ramp-up period(seconds):” as 20. Keep rest options as default.



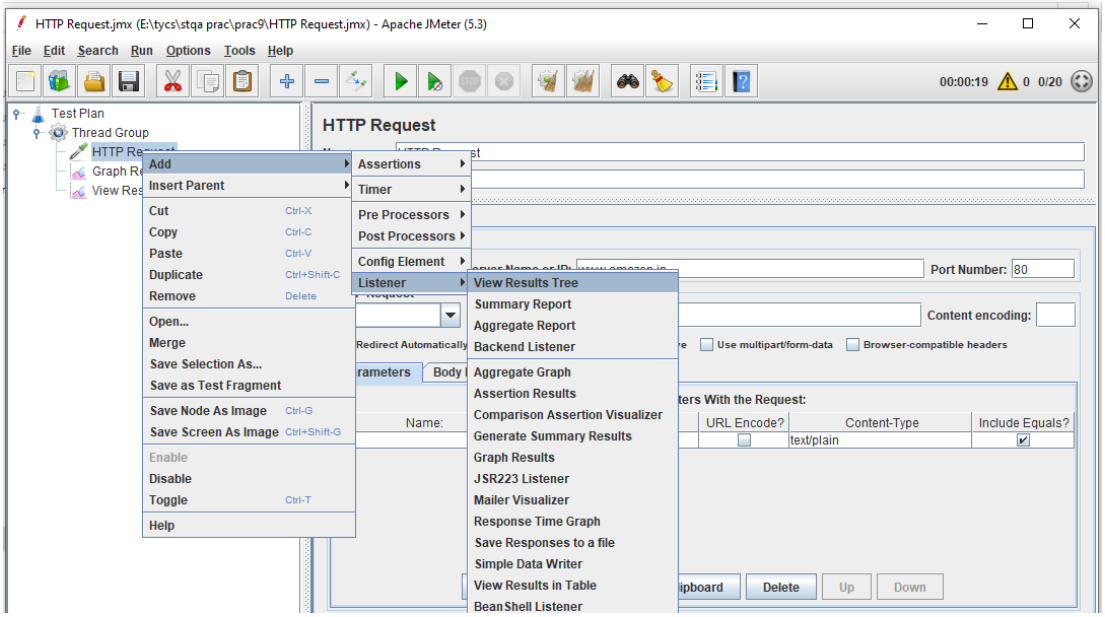
Step-5 :- We add a HTTP Request Sampler to the Thread Group Rightclick T hreadGroup → Add → Sampler → HT T P Request.



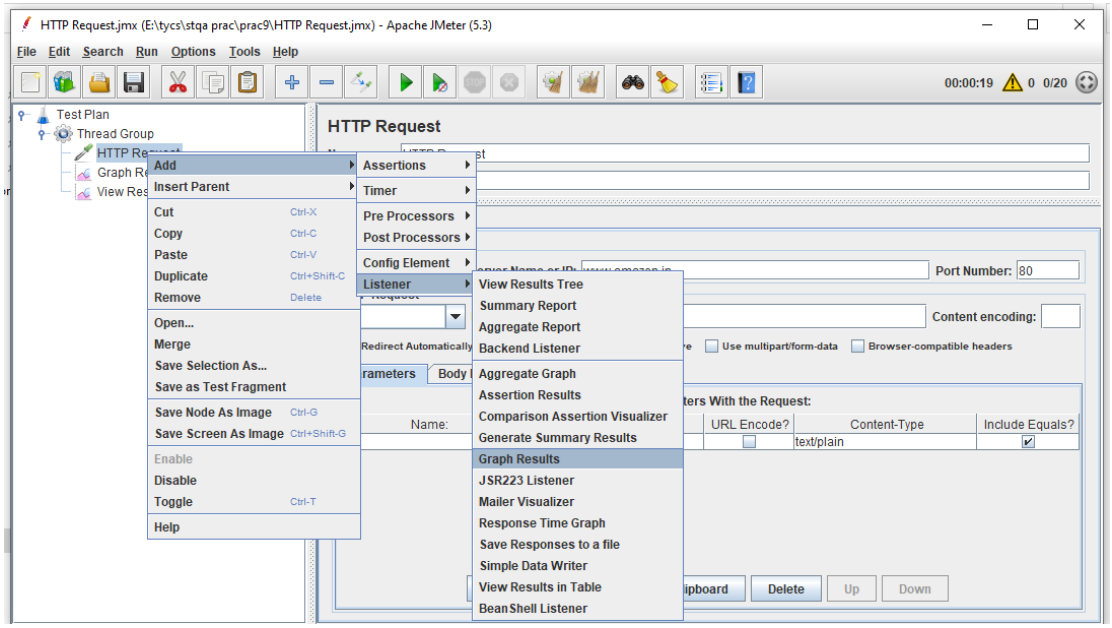
Step-6 :- Next, Edit the ”Server Name or IP:” to the specific website or Server IP address, optionally one configure port number and Request parameters and path as well.



Step-7 :- To view the log data add a ”View Results Tree Listener” Rightclick T estPlan → Add → Listener → ViewResultsTree.



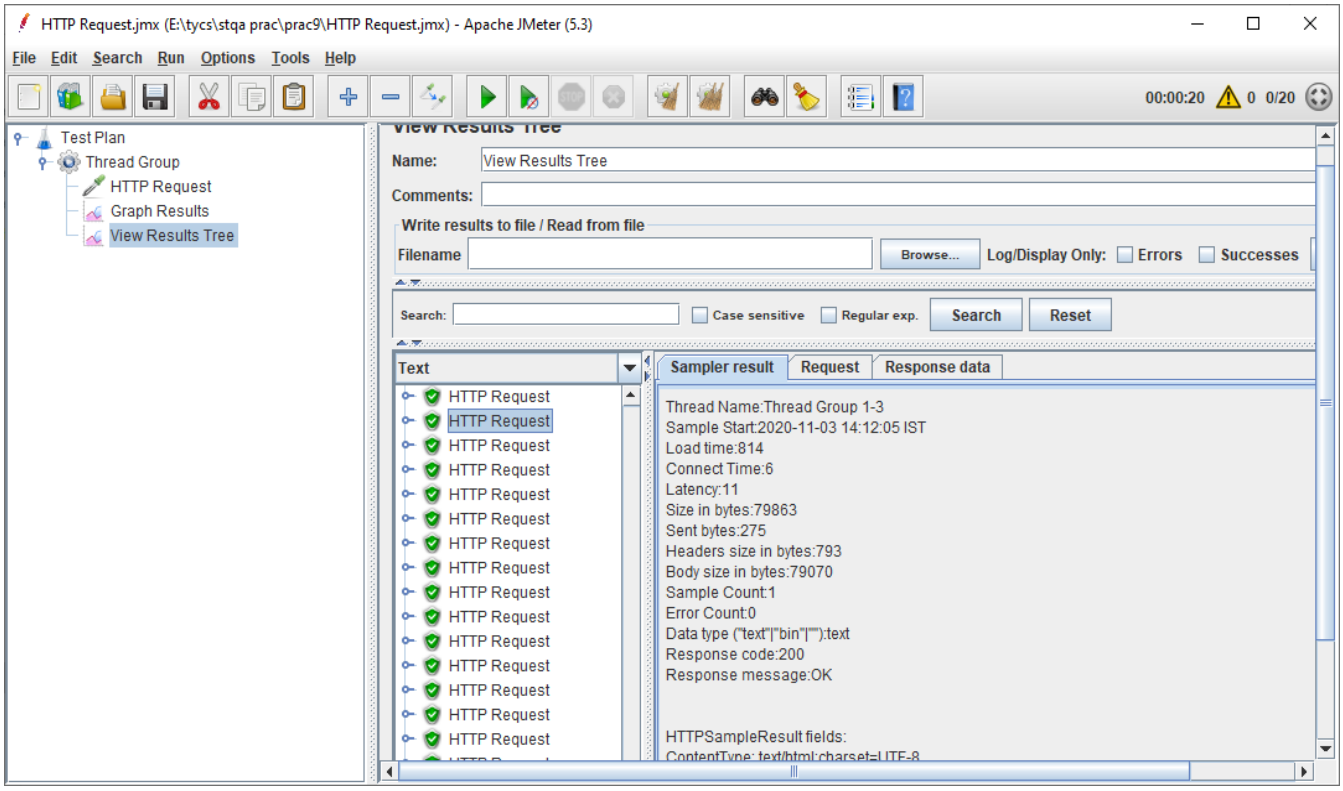
Step-8 :- To visualize the data we add a ”Graph Results Listener” Rightclick T estPlan → Add → Listener → GraphResults



Step-9 :- Next save the project as some filename into the hard drive by clicking Ctrl-S.

Step-10 :- Now Run the tests by clicking on the Green Play Button .

Step-11 :- After the test completes successfully you can view the logged results of the test in ”View Results Tree”



Step-12 :- One can also visualize the parameters by looking at the ”Graph Results”.