#### [Performance Testing RESTful Web Service](javascript:void(0);)

**Objectives**

* Demonstrate executing performance testing of a restful web service using JMeter
  + Test Plan, Thread Groups, HTTP Request, Configuring Listeners, configuring thread groups with loading of user
    - JMeter User Manual - https://jmeter.apache.org/usermanual/index.html

**Setup and Run JMeter**   
  
Follow steps below to execute JMeter:

* Extract the apache-jmeter-5.1.1zip file to D:
* Go to D:\apache-jmeter-5.1.1\bin in windows file explorer and execute the file jmeter.bat
* Check if this opens JMeter application

NOTE: Download apache-jmeter-5.1.1

**Test your favorite internet web site using JMeter**   
  
Follow steps below to configure testing of your favorite website:  
  
**Configuring the HTTP Request**

* JMeter launch opens up new test plan creation option
* Key in the test plan name as 'favorite-site-test'
* Right click on the 'Test Plan' in the left hands side and choose the below option:
  + Add > Thread (User) > Thread Group
* Leave the 'Thread Group' with default values
* Right click on 'Thread Group and select below option:
  + Add > Sampler > HttpRequest
* Set protocol as http or https based on the prefix of your favorite website url (for example, if the URL is https://www.google.com, then enter https)
* Click Advanced tab and set the proxy details:
  + Server Name: proxy.fis.com
  + Port Number: 6050
  + User Name: Employee ID
  + Password: Network Password
* Enter host name (Example: www.google.com or www.fis.com)
* Right click on 'Thread Group' and select the below specified options separately:
  + Add > Listener > View Results Tree
  + Add > Listener > View Results in Table
* Now all configuration is set. Save the test plan, using the menu 'File > Save' option

**Executing the test and analysing the results**

* To execute the test using the green play icon or using menu 'Run > Start'
* Click on View Results Tree and View Result in Table to see the results
* View Results Tree
  + Click on 'HTTP Request' in the left hand side
  + Click below tabs and view the details
    - Sampler Result
    - Request > Request Body
    - Request > Request Header
    - Response Data
* View Results in Table
  + Sample Time (ms) - denotes the total time taken to receive the response. This data is represented in milliseconds (1 Second = 1000 milliseconds)
  + Status - HTTP Response Status
  + Bytes - Number of bytes received in response
  + Sent Bytes - Number of bytes sent as request
  + Connect Time (ms) - Number of milliseconds it took to connect to the server

**Executing with multiple requests**

* Clear the existing results by right clicking on "View Results Tree' and 'View Results in Table', then selecting the 'Clear' option in the menu.
* Click on 'Thread Group'
* Change 'Number of Threads' to 2
* Run the test using play button.
* Now there will be two requests present in 'View Results in Table'

**Execute Performance Testing of RESTful Web Service with JMeter**   
The RESTful Service for getting all countries needs to performance tested. Identify the maximum threshold of your service.  
Follow steps below to complete the performance testing activity:

* Create a new Test Plan using menu File > New
* Name the test plan as 'get-countries-perf-test'
* Follow all configuration done in the previous hands on, but following configuration values needs to be changed:
  + Thread Group > Number of Threads = 10
  + HTTP Request > Basic
    - Protocol: http
    - Server Name: localhost
    - Port Number: 8090
    - Method: GET
    - Path: /countries
* Execute the test and see the results
* Save the test plan
* Change the Number of Threads gradually by increasing to 20, 30, etc. and observe the gradual increase in response time.
* In Thread Group modify the Loop Count value to 2 and the result. This will execute the threads in groups one after the other rather than in a single execution.

**Solving a business problem**   
The REST Service that returns all countries has to be deployed in production.  
It is expected that at any given point of time maximum 30 requests can be received for this service when it is in production.  
Also the business expects that the service should respond within 3 seconds.  
Given the above scenario verify if the service will be able to accomplish the above requirements or not.   
**NOTE:** This problem needs to be done by the learners independently.