

## **What is Client and Server?**

Client:

It is machine from where we send request

Server:

Server is machine which respond to the client request

## **What are the 3 Layers of Application?**

1. FRONT END (Presentation layer)
2. APPLICATION LAYER (Business Logic)
3. BACKEND LAYER ( Data Layer)

## **What is a Client Server Application?**

There are 3 Types of Client Server Application..

1. 1-Tier Application :  
Presentation layer, Data layer —> All are present on same machine  
e.g. Desktop Application, VLC Media Player
2. 2 Tier Application :  
Presentation layer and Data layer both are present on different machines  
E.g.
3. 3 Tier Application :  
Presentation layer, Business Logic and Data layer present on 3 or more machines present.  
E.g. Gmail, FB

## **What is Web Service and API? What is the difference between both?**

**Web service:** A Web service is a collection of open protocols and standards which are widely used for exchanging data between systems or applications. Means web service is a method of communication between two applications of electronics devices over the world wide web (www).

**API:** API is the acronym for Application Programming Interface. It is a software interface that allows two applications to interact with each other without any user intervention.

Web Services	API
Web service is a collection of open source protocols and standards used for exchanging data between systems or applications	API is a software interface that allows two applications to interact with each other without any user involvement.
All Web services are APIs	All APIs are not web services
Web service is used for REST, SOAP and XML-RPC for communication	API is used for any style of communication.
Web service supports only HTTP protocol	API supports HTTP/HTTPS protocol
Web service supports XML	API supports XML and JSON.
You need a SOAP protocol to send or receive data over the network. Therefore it does not have light-weight architecture. I.e. more bandwidth required.	API has a light-weight architecture. It required less bandwidth.

**What are the types of Webservices? What is the difference between them? What is the difference between SOAP and REST?**

There are 2 types of Web Services:

- SOAP (Simple Object Access Protocol) Web Service
- REST (REpresentational State Transfer) Web Service

SOAP	REST
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SOAP is a protocol.	REST is an architectural style.
SOAP stands for Simple Object Access Protocol.	REST stands for REpresentational State Transfer.
SOAP can't use REST because it is a protocol.	REST can use SOAP web services because it is a concept and can use any protocol like HTTP, SOAP.
SOAP uses services interfaces to expose the business logic.	REST uses URI to expose business logic.
SOAP defines standards to be strictly followed.	REST does not define too much standards like SOAP.
SOAP requires more bandwidth and resources than REST.	REST requires less bandwidth and resources than SOAP.
SOAP defines its own security.	RESTful web services inherit security measures from the underlying transport.
SOAP permits XML data format only.	REST permits different data formats such as Plain text, HTML, XML, JSON etc.
SOAP is less preferred than REST.	REST is more preferred than SOAP.

### **Which Language is used in Web Services to communicate?**

- In Web Services XML (Extensible Mark-up Language) and JSON (Javascript Object Notation) used
- SOAP Web Service uses XML
- REST Web Service uses JSON

### **What is Difference between XML and JSON?**

JSON	XML
It is JavaScript Object Notation	It is Extensible markup language
It is based on the JavaScript language.	It is derived from SGML. <a href="#">standred genralize markup language</a>
It is a way of representing objects.	It is a markup language and uses tag structure to represent data items.
It supports arrays.	It doesn't support arrays.
Its files are very easy to read as compared to XML.	Its documents are comparatively difficult to read and interpret.
It doesn't use the end tag.	It has start and end tags.
It is less secure.	It is more secure than JSON.
It doesn't support comments.	It supports comments.
It supports only UTF-8 encoding.	It supports various encoding.
Example: <pre>{   "student": [      {       "id": "01",       "name": "Tom",       "lastname": "Price"     },      {       "id": "02",       "name": "Nick",       "lastname": "Thameson"     } ,      {       "id": "03",       "name": "Manoj",       "lastname": "Ithape"     }   ] }</pre>	Example: <pre>&lt;?xml version="1.0" encoding="UTF-8" ?&gt; &lt;root&gt;   &lt;student&gt;     &lt;id&gt;01&lt;/id&gt;     &lt;name&gt;Tom&lt;/name&gt;      &lt;lastname&gt;Price&lt;/lastname&gt;   &lt;/student&gt;   &lt;student&gt;     &lt;id&gt;03&lt;/id&gt;     &lt;name&gt;Manoj&lt;/name&gt;      &lt;lastname&gt;Ithape&lt;/lastname&gt;   &lt;/student&gt;   &lt;student&gt;     &lt;id&gt;02&lt;/id&gt;     &lt;name&gt;Nick&lt;/name&gt;      &lt;lastname&gt;Thameson&lt;/lastname&gt;   &lt;/student&gt; &lt;/root&gt;</pre>

<pre> ] } </pre>	<pre> &lt;/student&gt;  &lt;/root&gt; </pre>
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## What are the components of Web Services?

There are mainly 2 component of Web Services:

### 1. WSDL: Web Service Description Language

WSDL is a xml document containing information about web services such as method name, method parameter and how to access it.

WSDL is a part of UDDI. It acts as an interface between web service applications. WSDL is pronounced as wiz-dull.

### 2. UDDI: Universal Description, Discovery and Integration

UDDI is a XML based framework for describing, discovering and integrating web services.

UDDI is a directory of web service interfaces described by WSDL, containing information about web services.

## What is the End Point?

End Point is the point location or address where Web Service is hosted.

## What is WSDL (Web Service Definition Language) or Contract of Web Services OR Service Description?

- A WSDL is an XML document that describes a web service.
- Also known as Contract of SOAP Web Service. In that Contract file /WSDL file mentioned all supporting operations and supporting Standards these all information included in that.
- To Test any SOAP Web services WSDL /Contract of Web Services is required. This is Heart of the Web Service.

- To Test SOAP Web Services in SOAPUI Tool we need to import WSDL files in SOAP UI Tool.

### **What is the difference between SOAP and WSDL?**

<b>SOAP</b>	<b>WSDL</b>
A SOAP message in an XML document which is used to transmit your data.	WSDL is an XML document which describes how to make requests to your web service.
Basically SOAP messages are the data you transmit.	WSDL tells you what you can do and how to make the calls.
SOAP is the structure you apply to your message /data for transfer.	WSDL is used only to determine how to make calls to the service in the first place.

### **What is the Role / Task/ Work of a Web Services Tester?**

- Is the Web Service responds properly when we send a request, we check whether we get the expected response or not. That is our scope.
- How does the Web Service react to different requests and whether all responses are correct or not?

### **Explain API Testing Process?**

1. Review and Understand API Specification
2. Identify how to Access, identify different parameters , responses etc..
3. Test Cases
4. Execute Manual/Automate test cases then execute
5. Report defect to Development team

### **What is REST Web Services?**

- REST stands for REpresentational State Transfer. REST is web standards based architecture and uses HTTP Protocol.
- Web services based on REST Architecture are known as RESTful web services.
- These web services use HTTP methods to implement the concept of REST architecture.
- A RESTful web service usually defines a URI, Uniform Resource Identifier a service, provides resource representation such as JSON and a set of HTTP Methods.
- Following four HTTP methods are commonly used in REST based architecture.
  - POST – Used to create a new resource (CREATE) [C]
  - GET – Provides a read only access to a resource (RETRIEVE) [R]
  - PUT – Used to update a existing resource or create a new resource (UPDATE) [U]
  - DELETE – Used to remove a resource (DELETE) [D]

Means by using HTTP methods we perform CRUD (Create/Retrieve/Update/Delete) Operations.

### **Explain What are the status Codes?**

Client Side and Server Side

HTTP Status Codes		
<b>Level 200 (Success)</b> 200 : OK 201 : Created 203 : Non-Authoritative Information 204 : No Content	<b>Level 400</b> 400 : Bad Request 401 : Unauthorized 403 : Forbidden 404 : Not Found 409 : Conflict	<b>Level 500</b> 500 : Internal Server Error 503 : Service Unavailable 501 : Not Implemented 504 : Gateway Timeout 599 : Network timeout 502 : Bad Gateway

### What is the difference between the GET and POST method?

GET	POST
GET method is used to getting information from server side	It is used to POST the information to the server.
It perform READ ONLY operation	It perform WRITE operation
Only Text and Character types of data can send	Any type of data can send
Limited amount of data send	No limitation to send data
LESS Security provides this method because the user request is directly exposed in the URL bar. So not good for sensitive information.	It provide HIGH security
Bookmarking is possible	Bookmarking is not possible
Caching is also possible	Caching is not possible.
Usually 200 Status code displayed on successful GET Request	Usually 201 Status code displayed on successful POST Requests or some cases like login validation 200 status code displayed (Because here we just validate login details not create anything new)

### What is the Difference Between PUT and POST?

PUT	POST
PUT HTTP method usually used to	POST HTTP method used to Create



update the entity/resources	new entity/resources.
It Update entity	It Create Entity
If we repeatedly execute same PUT request then it always produce same result	If we execute the same POST request multiple times then Multiple resources/entities are created.

## What is API?

API stands for Application Programming Interface. It is used to communicate between two applications or electronic devices over the worldwide web (www). API provides the interoperability between different kinds of hardware and software platforms.

API supports different HTTP methods like GET, POST, PUT, DELETE in the browser. Below listed tools are used to test API

- Postman
- SOAP UI
- JMeter
- REST-Assured
- Katalon Studio
- Apigee
- Karate DSL
- Fiddler

In the above tools a mostly QA person prefers the Postman tool over other tools.

## What are the advantages of API?

The advantages of using APIs are:

- **Personalized Content:** API enables businesses to get a clear understanding of the tastes and preferences of the customer. This allows businesses to make personalized recommendations and generate better customer leads and interactions.

- **Automation:** One no longer needs to make assumptions and interpretations manually. API does it all for you by managing all the workflow making business processes more productive and efficient.
- **Fraud Prevention:** API has various levels of security depending upon the type of API that you use which ensures that only authorized personnel have access to the data generated using API.
- **Improved Competency:** The information that is transmitted from one system to another is quickly intercepted and interpreted by API. This level of efficiency ensures information automatically available to every platform which leads to quicker and improved decision making.
- **Adaptability:** API can anticipate changes in terms of needs that arise in the due course of business. It uses the technology at its disposal to analyze the information present within the system more closely and thus makes the service provisions more flexible.
- **Interoperability:** Compatible with all platforms. API exchanges data using XML or JSON. These transfer modes are completely language-independent, meaning that you can select any core language

### **What are the advantages of API Testing?**

- Access Without UI
- Early defect identification
- Test for Core Functionality
- Time Effective
- Language-Independent
- Easy Integration With GUI

### **Why Postman?**

- 1- Free, open-source and easy to install
- 2- Easy to create Collection/Test suite
- 3- Easy to create and maintain request in the folder structure
- 4- Facility to create multiple environments and maintain test data (Global and Local level)
- 5- Easy to maintain execution order of requests
- 6- Reusability of defined functions
- 7- Easy to export and import collection

- 8- Allows data-driven testing using .csv and .json file
- 9- Easy to run remotely
- 10- Allow integrating with CI tool like Jenkins using Newman Command line tool
- 11- Allow to work within team collaboratively
- 12- Supports all platforms
- 13- Wide helping community present

## **How to Install POSTMAN Tools on Mac /Windows Machine?**

There are two forms of Postman tool available in the market and it is free.

- Standalone .exe file and Please refer [link](#)
- Chrome Browser plug-in

The Postman tool needs to login with a Gmail account and login with it.

## **What is a Collection in Postman?**

- Collection is nothing but a Test suite.
- It included multiple test cases.
- The test Case included requests.
- Collection-> Testsuite->Test Cases-> Requests

## **What are the parts of the URL?**

Any URL includes ---> Domain (base url)+ URI + Query String

E.g <https://reqres.in/api/users?page=2>

Here,

Base URL or End Point: <https://reqres.in>

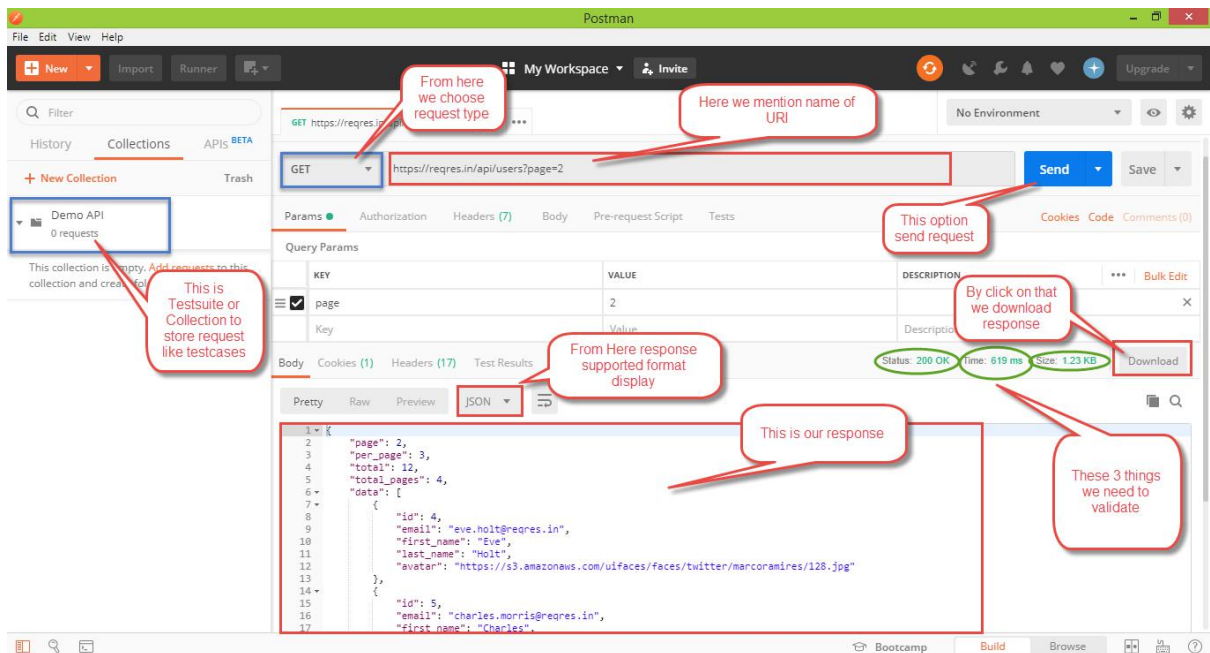
URI: </api/users>

Query String: <?page=2> (Part which comes after the ?)

## **Explain How we send GET Requests?**

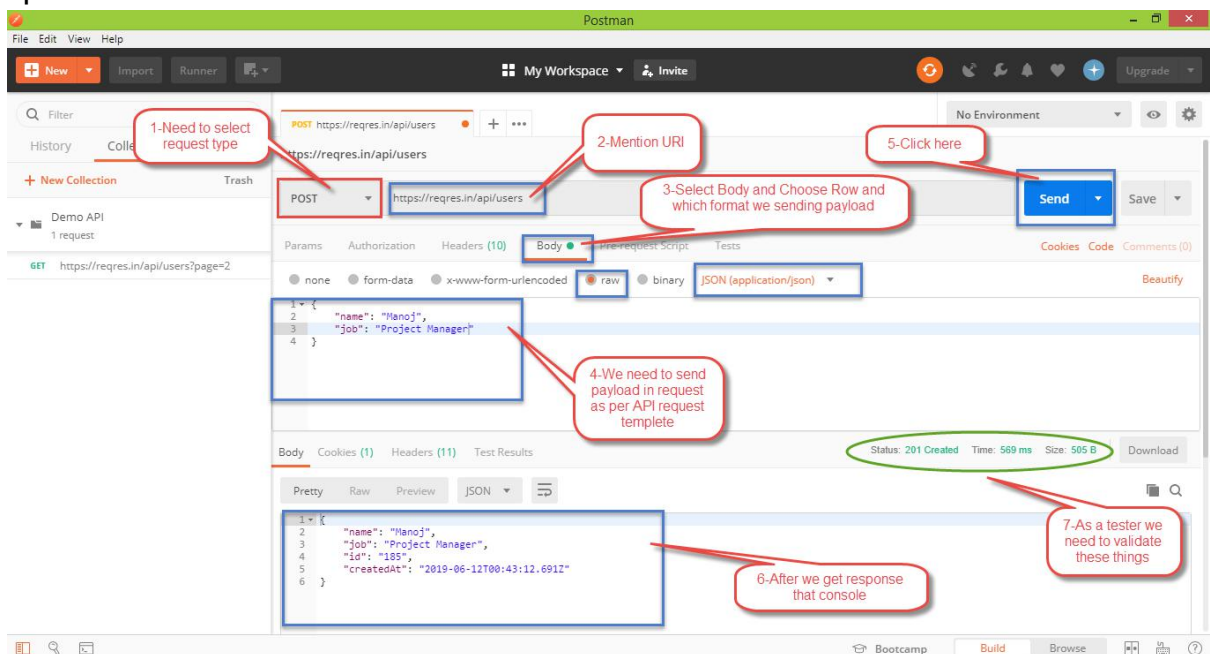
For GET requests we need to hit the URL and we get a response. In request no need to send payload.

As below screenshot..



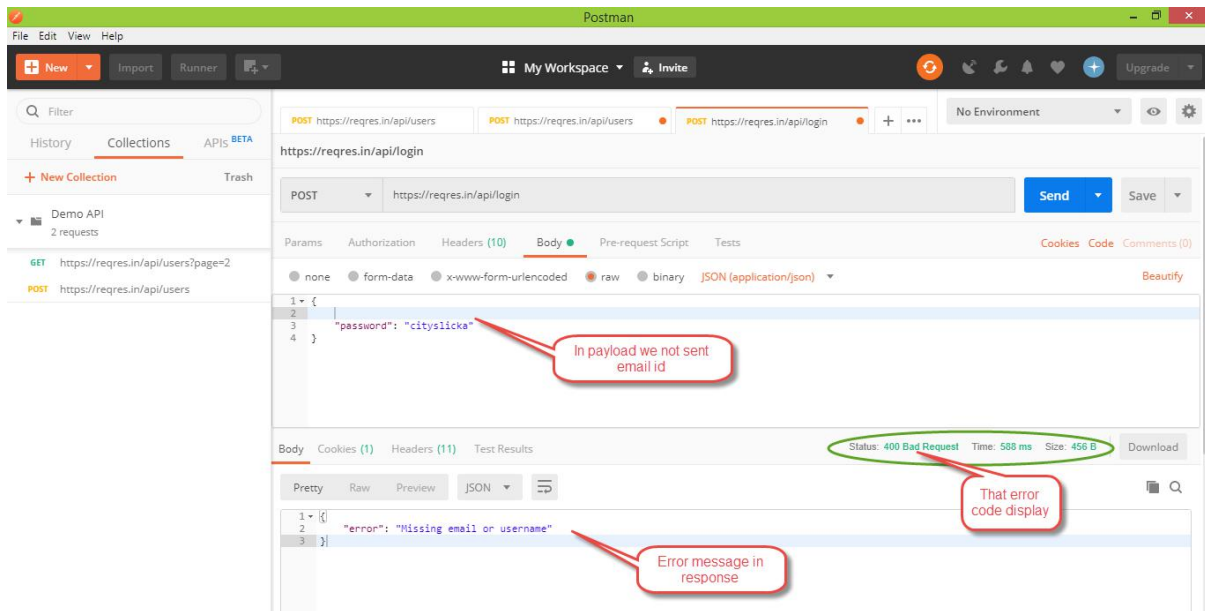
## Explain How we send POST Requests?

For POST requests we need to send the request payload to the server. And the process as below..



**If we send invalid data / payload then the server sends error with status code, Explain?**

If we send invalid data / payload then server send error with status code e.g.



## How to test API locally?

- API normally available in .jar, .dll, .exe format in company.
- We already set up an api jar in my machine to run the following steps..

Run below command

```
C:\Postman_Student API>java -jar studentApp.jar --  
server.port=8085
```

Open App in Browser

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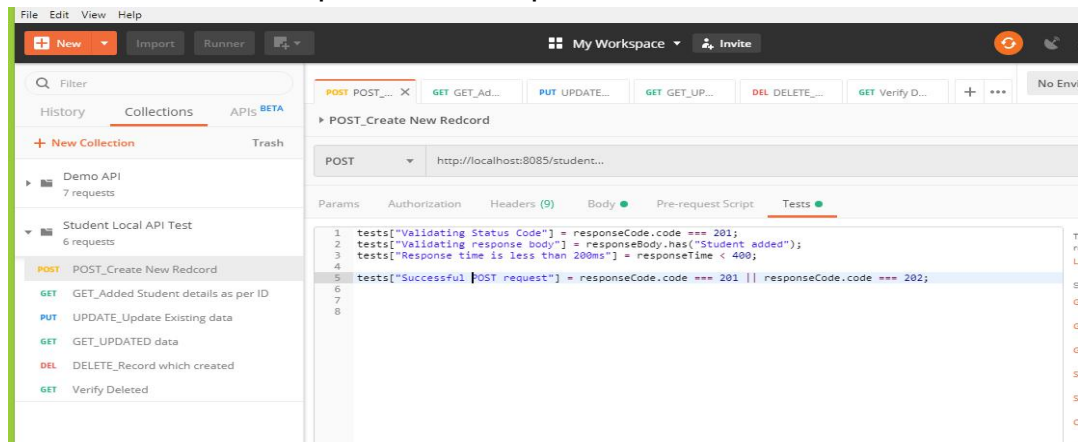
<http://localhost:8085/student/list>

## How do we test API?

With the help of an API specification document we get an API overview idea. And with the help of that we test applications. Please refer below API Specification [Docs...](#)

## How do we validate the API using the POSTMAN tool? OR How to Add verification points in Postman? Also explain a few Verification points?

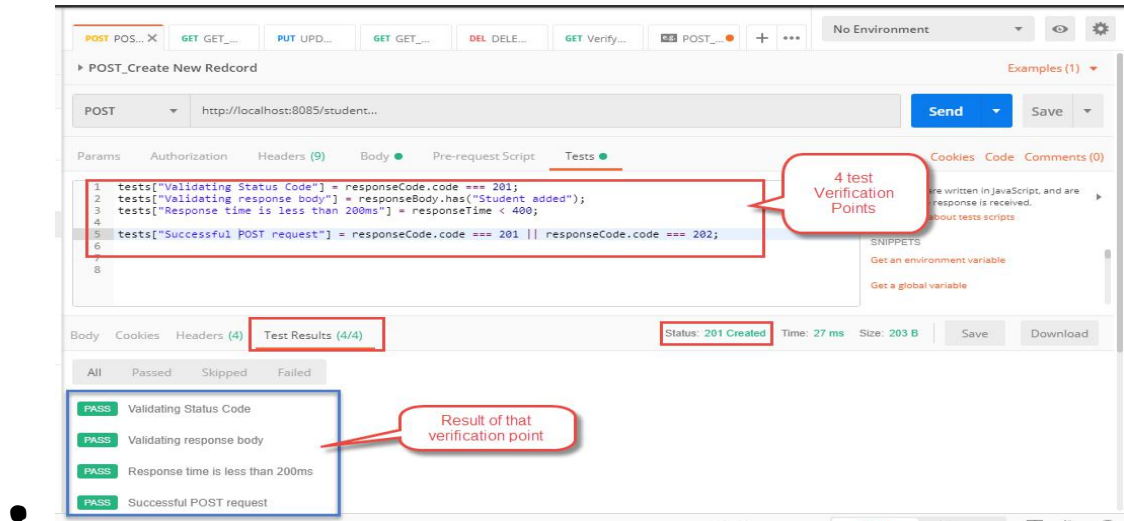
- For this we need to use the "test" tab which presents under request.
- For add validation we need to use "javascript" language.
- I mostly prefer a script oriented approach instead of a Function oriented approach.
- Below shown examples and samples...



Validations	Script	Function
<b>Check if response body contains a string</b>	tests["Validating response body"] = responseBody.has("Student added");	pm.test("Body matches string", function () {  pm.expect(pm.response.text()).to.include("Student added"); });
<b>Check Status code</b>	tests["Validating Status Code"] = responseCode.code === 201;	pm.test("Status code is 201", function () {  pm.response.to.have.status(201); });
<b>Response time is less than 200ms</b>	tests["Response time is less than 200ms"] = responseTime < 200;	pm.test("Response time is less than 200ms", function () {  pm.expect(pm.response.responseTime).to.be.below(200); });
<b>Successful POST request status code</b>	tests["Successful POST request"] = responseCode.code === 201    responseCode.code === 202;	pm.test("Successful POST request", function () {  pm.expect(pm.response.code).to.be.oneOf([201,202]); });
<b>Content-Type is present in Header</b>	tests["Content-Type is present"] = postman.getResponseHeader("Content-Type");	pm.test("Content-Type is present", function () {  pm.response.to.have.header("Content-Type"); });

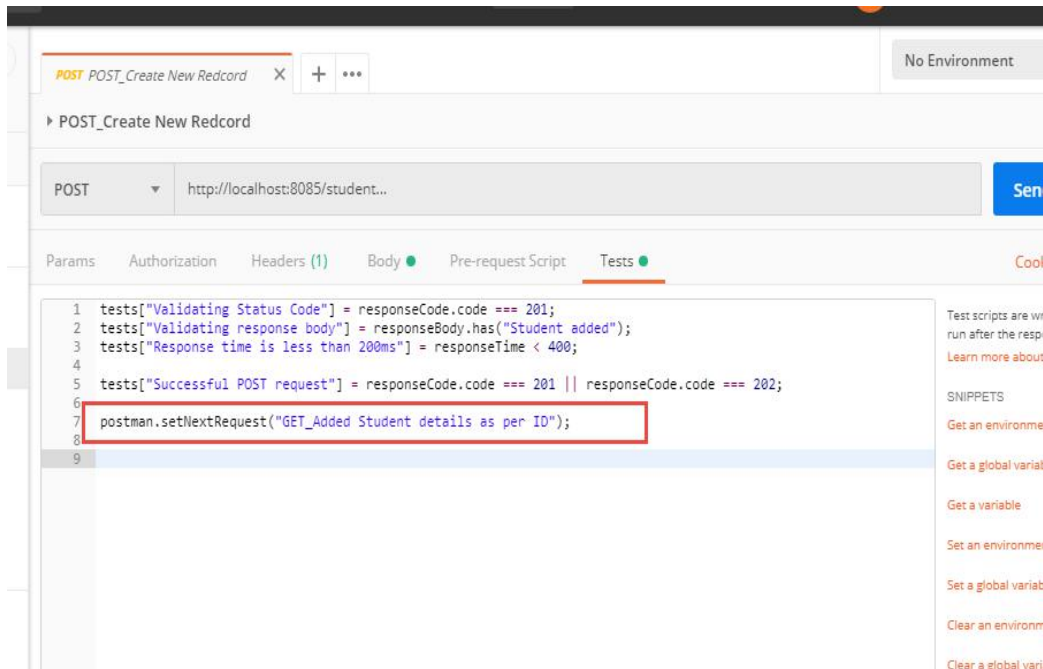
- Please note: In the above screenshot which text shown in square bracket is user defined text.

**Explain how we get the result of the verification point?**



## How to execute the entire collection in one shot? How to set the execution sequence for request in Postman?

- Please Note: By default it executes in **ALPHABETICAL** order.
- To set a specific execution sequence we need to mention under verification point we need to mention which next request will execute in the test.
- E.g. `postman.setNextRequest("Name of Next required request name");`





## How do we execute one or more collections?

By clicking on "Runner" we can execute one or more collections.

## How to Add folder in Collection and Add request in folder?

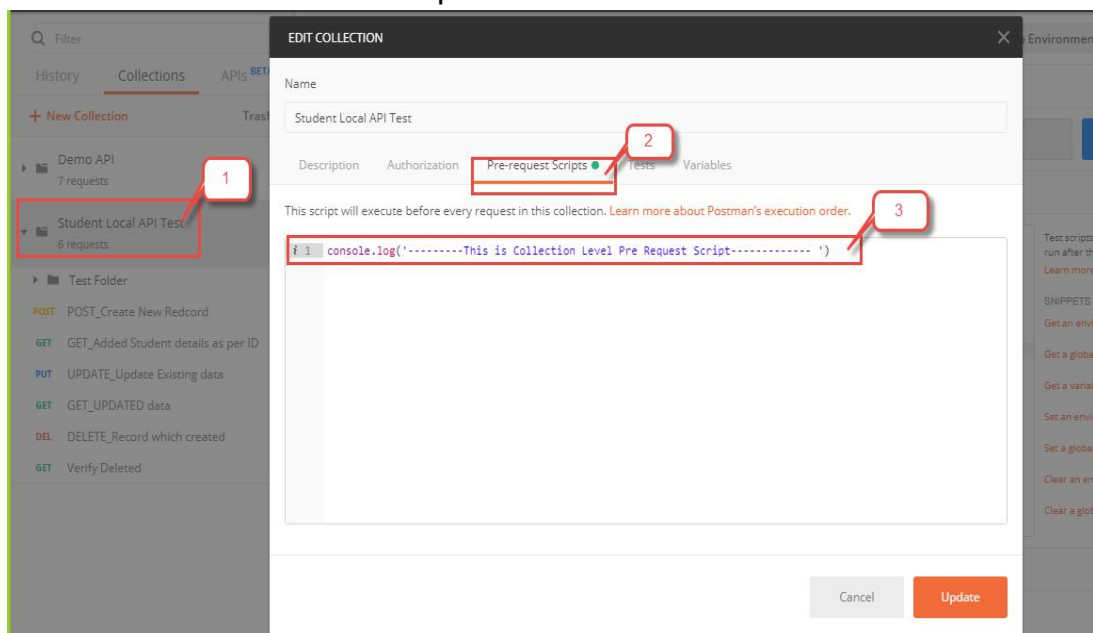
Click on 3 dots of collection-> Add Folder->Give name to folder and drag and drop request in that folder if we want to add request under that folder

## What is a Pre-request script?

- Script which we need to execute before request getting executed that call prerequisite.
- It is under the test tab.
- It is three types
  - Collection level and
  - Folder Level and
  - Request level

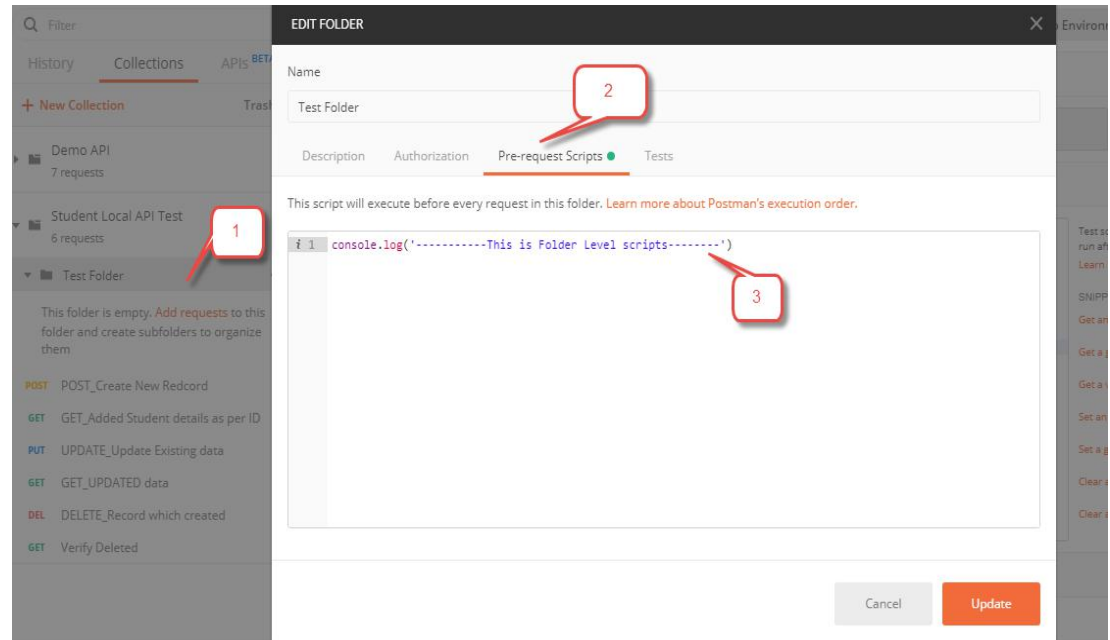
### 1- Collection Level:

- It we need to define at collection level and it execute before start collection execution
- To add that pre request script need to click on 3 dots which present near collection name-> Edit-> Choose Pre-request script tab-> Add there-> update

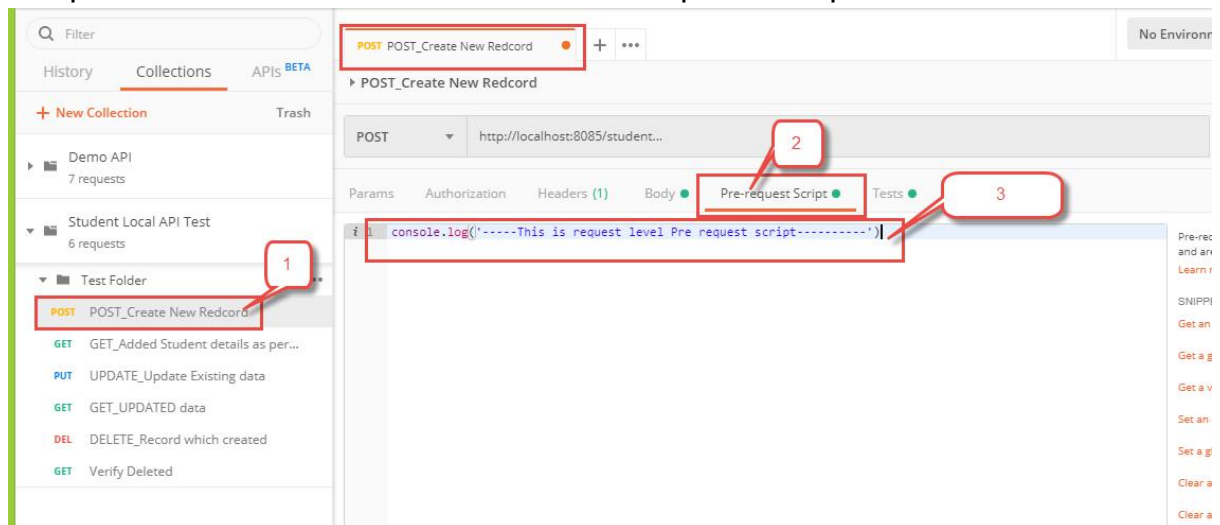


### 2- Folder Level:

- For this we need to add a pre-request script add in folder level.
- Create Folder -> Click on 3 dots which present in folder name-> Click on Edit->Choose Pre-Request Script Tab-> Add required pre-request steps and click on Update

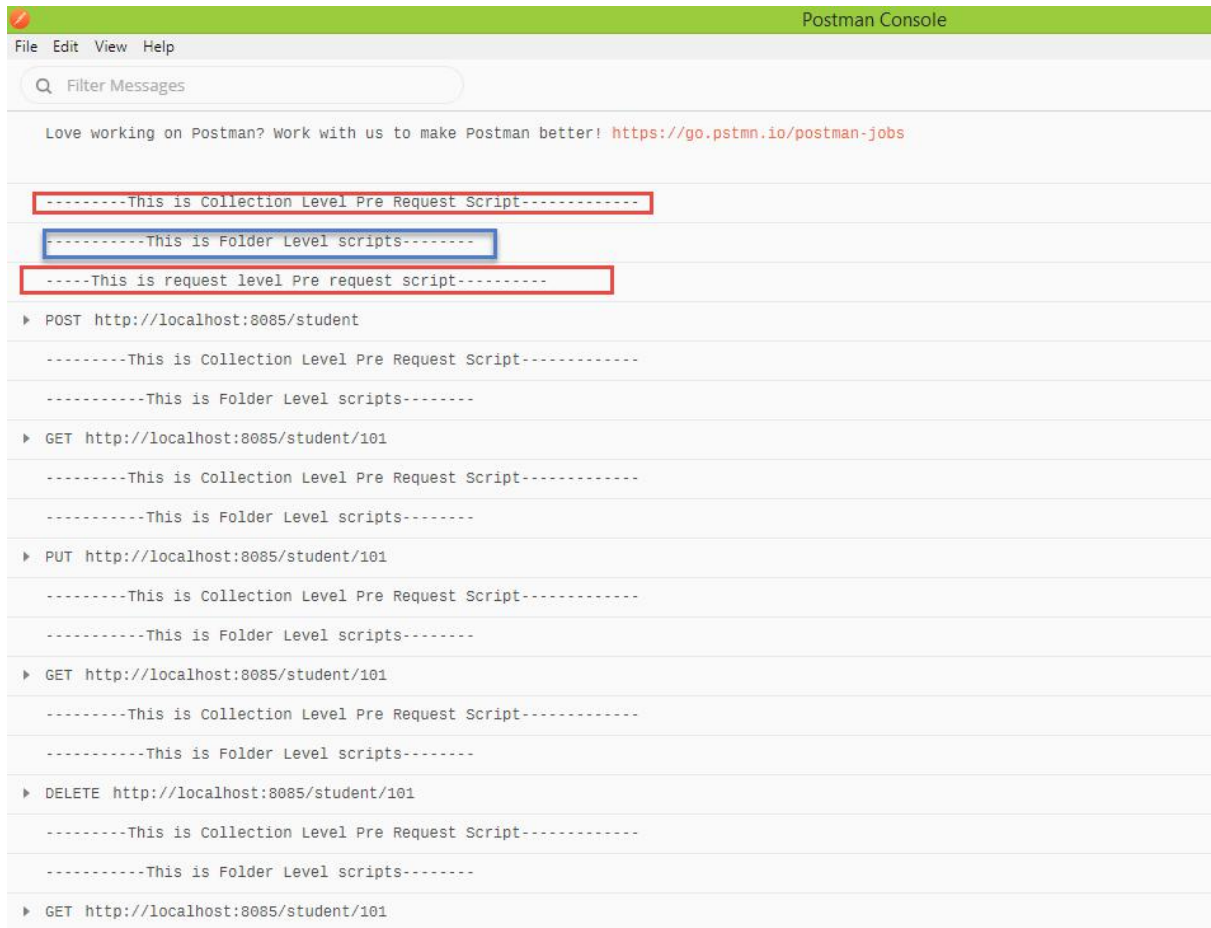


3- Script Level: For this need to add Pre- request Script in below tab..



Output display as below on console...

Please follow the navigation below to open the Postman Console..  
View-> Show Postman Console



## Explain Variable in Postman?

- There are two types of variables
  - 1- Collection Level Variables and
  - 2- Global Level Variables
- Variable we define one place and use it at multiple places in script.

```

Postman variables
-----
Collection variables

    Right click on Collection-->Edit-->Variables-->Define variables(Key, value)-->Update
    Usage:    {{key}}

Global variable/Environment variables



    GearIcon(right top corner)-->Globals-->Define variables(Key, value)-->Update
    Usage:    {{key}}
  
```

- When We want to use it then {{ Variable\_Key }} is mentioned.

## Explain Data driven testing in Postman using JSON and CSV File?

1- DDT Using JSON File

2- DDT Using CSV (Comma Separated Value File)

 data1.csv	24-07-2018 12:25 ...	Microsoft Office E...	1 KB
 data1.json	24-07-2018 12:25 ...	JSON File	1 KB

- Below we explained the How to do that Data driven testing one by One.

### **1- Using JSON File:**

- For Example we need to Send a POST request below..

Test1

-----

URL: <https://reqres.in/api/register>

Request Type: POST

Data format: Json

Test Data : JSON, CSV

Request Body:

```
{  
  "email": "manoj2gmail.com",  
  "password": "pass123"  
}
```

- Above test case we want to do DDT using json then we need to create one JSON file and in that we need to keep all data as below..

```

1  [
2  {
3      "email": "abc@gmail.com",
4      "password": "abc"
5  },
6
7  {
8      "email": "xyz@gmail.com",
9      "password": "xyz"
10 },
11
12 {
13     "email": "mno@gmail.com",
14     "password": "mno"
15 }
16 ]

```

Data in  
Json  
FOrmat

- In payload/ request body we need to mention key name like “{{email}}” and “{{password}}”
- Means above request modify as below..

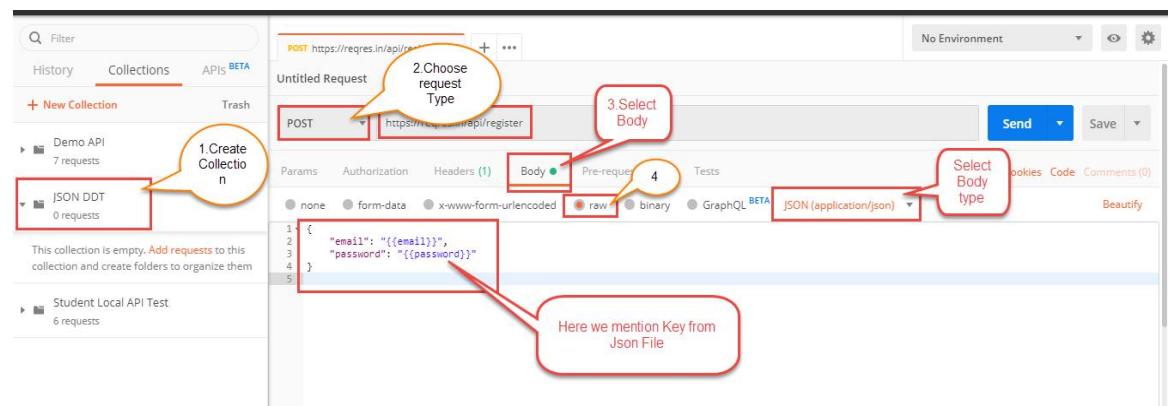
Request Body:

```

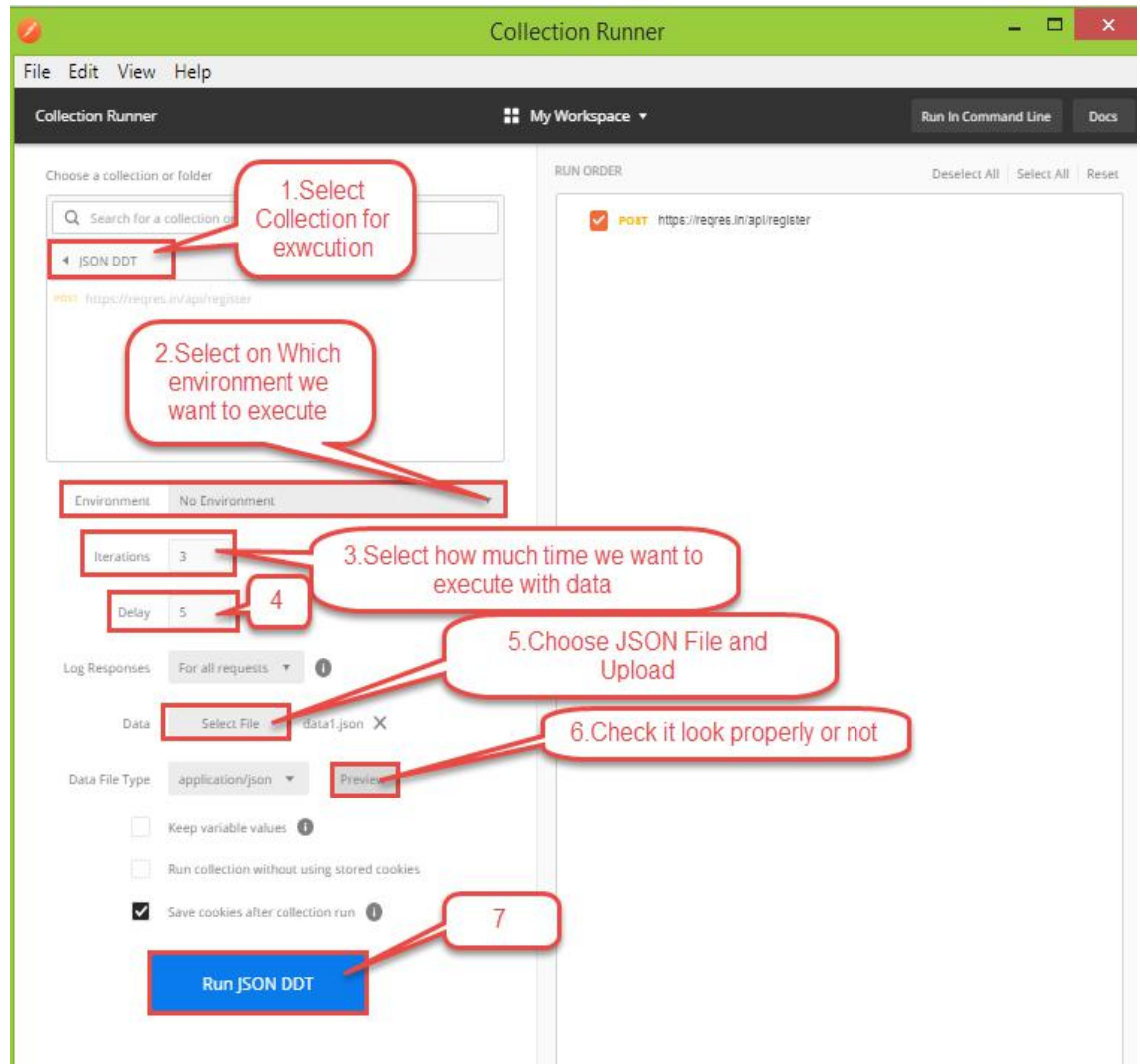
{
  "email": "{{email}}",
  "password": "{{password}}"
}

```

- Follow below steps in Postman to do above test..
- Follow Screenshot below



- Save Above request in required collection
- Then Click on “Runner” to execute that request.



- When we click on Preview Json display like..

PREVIEW DATA

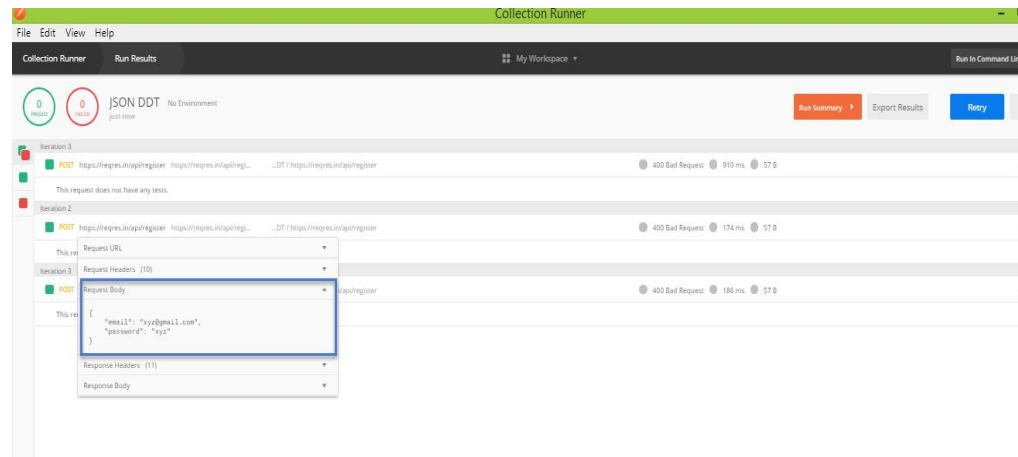
No of Entries

Iteration	email	password
1	"abc@gmail.com"	"abc"
2	"xyz@gmail.com"	"xyz"
3	"mno@gmail.com"	"mno"

key

Values

- Click on "Run JSON".
- After execution below the execution report display..



## 2- DDT Using CSV File:

- Test data Need to save in below format in .csv file

	A	B	C
1	email	password	
2	abc@gmail.com	abc	
3	xyz@gmail.com	xyz	
4	mno@gmail.com	mno	
5			
6			
7			
8			

- All processes are the same as the Json file. Only need to choose ".csv" file while we upload file in runner.

## How to Convert JSON to Excel or JSON to CSV or Vice versa?

- For this I need to use Online tools.

## How to Create an Environment in Postman?

- Click on the "Environment" icon which is present on the left sidebar of the Postman tool.
- Click on the "+" option.
- Fill all options and Click on "OK".

## How to Export Collection of API from Postman tool?

- Select Collection-> Click on Three Dots (...) -> Choose Export Option-> Choose Option and Click on "Export"

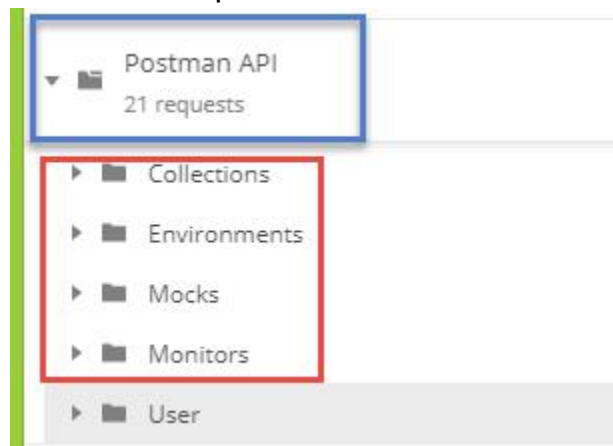
- Please Note: Collection is Export in JSON file.

### **How to import Collection or APIs in Postman tool?**

- Click on "Import" option which is present in the Top left ribbon.
- Select required Json File

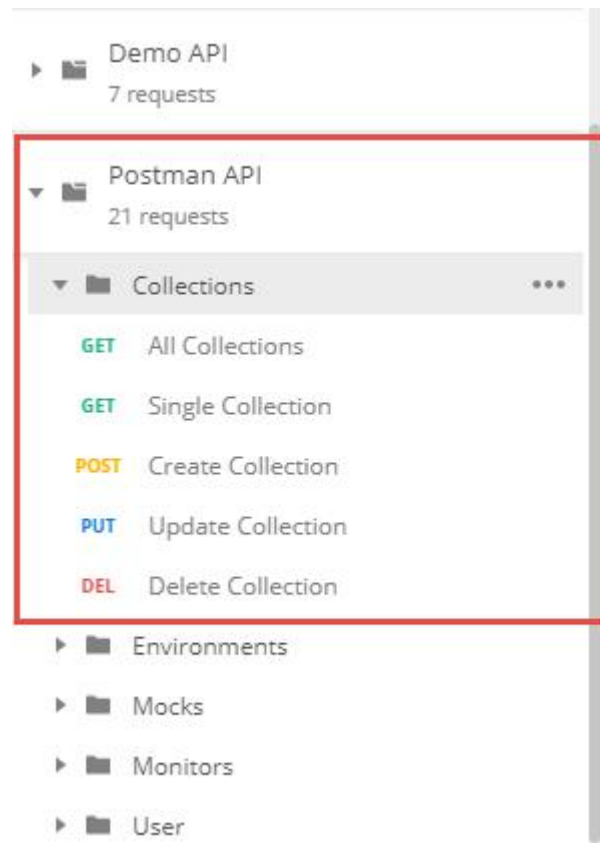
### **Explain Postman Tool APIs? How to Access Postman APIs?**

- The Postman tool itself is built by using API's.
- Below the screenshot we showed the imported APIs related to Postman and below that explained..
- When We import Postman API below Folders displayed..

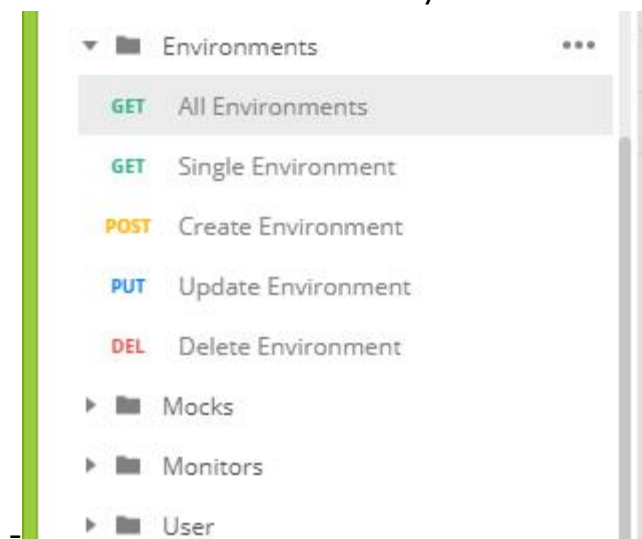


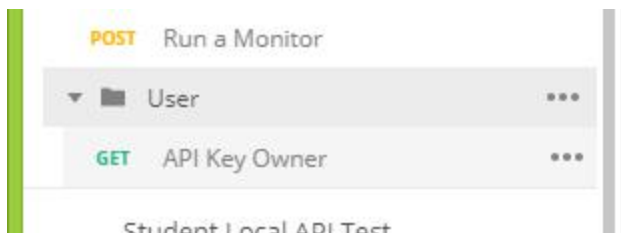
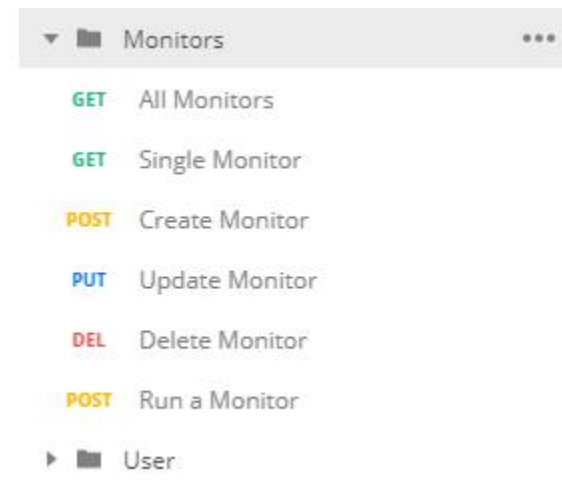
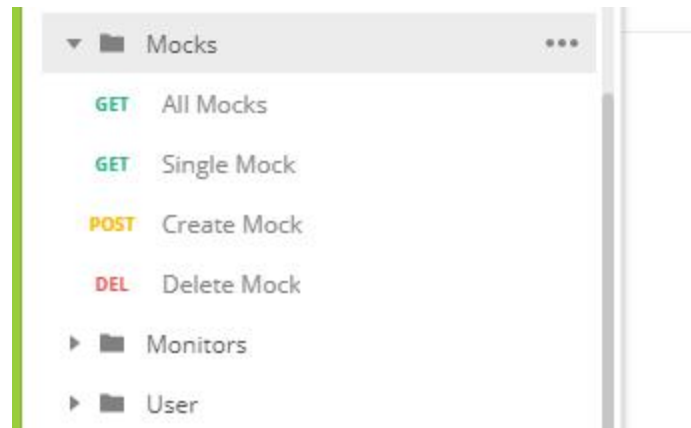
->Collections:





- All Collection: This request used to get All Available collections which we created in our system





## How to Get an API Key? / How to Generate API Key in Postman?

- Choose manage Account option which present Top Right Side
- Click on profiles
- New Page display-> Click on "Back to Workspace"
- Go to "Integrations" tab
- Click on "Postman APIs"

- Click on the "Get Postman API key" option.
- Select key and Copy it
- Create Global variable

### **How to execute Collection through Command Line from machine?**

- Need to Node.js
- Install Newman to generate reports by using below command  
npm install -g newman
- Install npm(Node JS package manager) To generate Report
- Set Environment Variable
- Export Postman Tools available collections in Json and save in the folder.
- Go to that folder and open cmd and type below command to execute collection  
*newman run NameOfCollection.json -r html*
- By using -r html in c drive one postman folder created in html report save in it automatically newman folder.

### **How to execute Collection through a remote machine?**

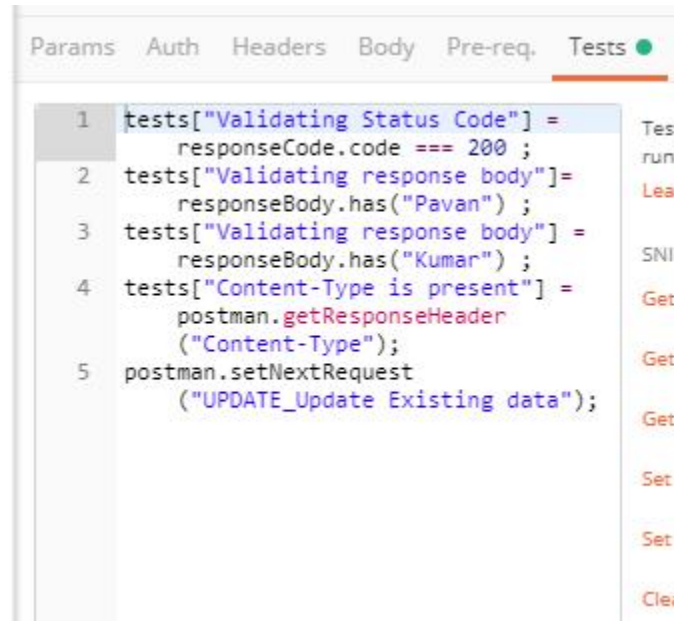
- For this we need to share the URL of that collection and from that remote machine all above mentioned things should be present. (Except json file of collection we use URL here)
- To share that collection URL go to postman tool.-> Select Collection-> Click on 3 dots-> Click on "Share Collection"-> Click on "Get Link" tab-> Click on "Get Link"
- Share that link to remote user and from that remote machine open cmd and run below command  
Newman run EnterThatCollectionURL -r html

### **How to Test SOAP Web Services Using PostMan?**

- Need to Use WSDL File URL
- Add Request same as REST in Postman Tool URL of WSDL File.
- Add one plugin into CHROME browser i.e. "Browse WSDL" or "Wizdler " plugin to get the body from WSDL.

- Open WSDL url in browser and with the help of above plugin get body of WSDL
- That tool shows Request Payload in the browser. Copy that from the browser and paste it in the Postman body field to send a request.
- Select request type is XML instead of JSON.

## How to validate responses in Postman?



## How to update the environment variable from response in Postman? (Chaining)?



