Web ServicesTesting

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WHAT IS WEB SERVICE ?
QA POINT OF VIEW

Request
Message

Client

/ User

Internet

Response
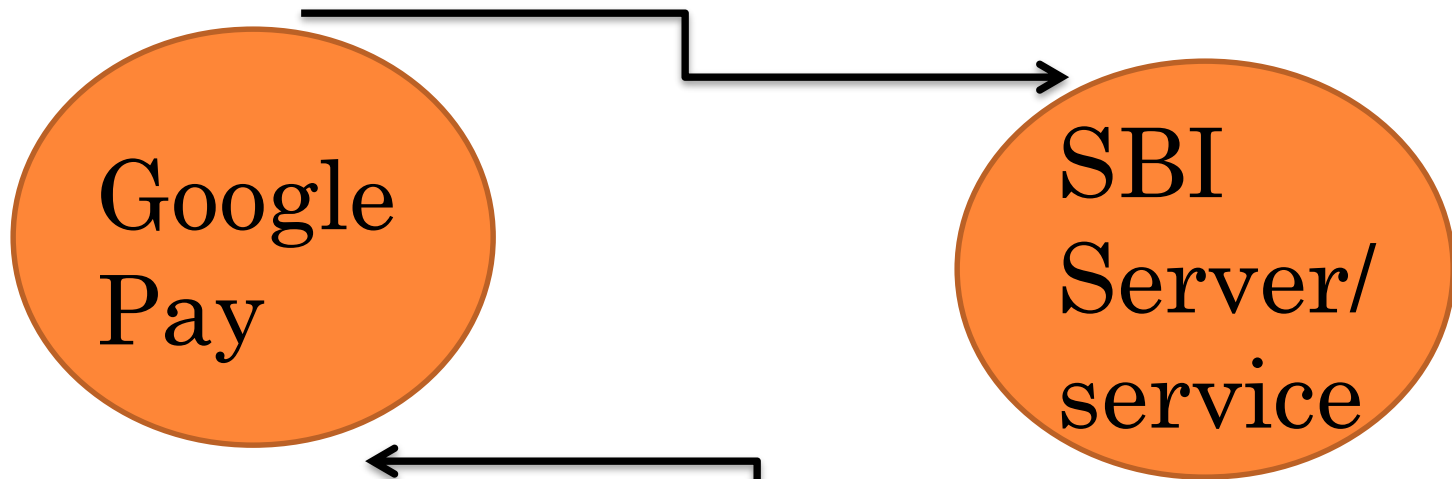Message

Web Service
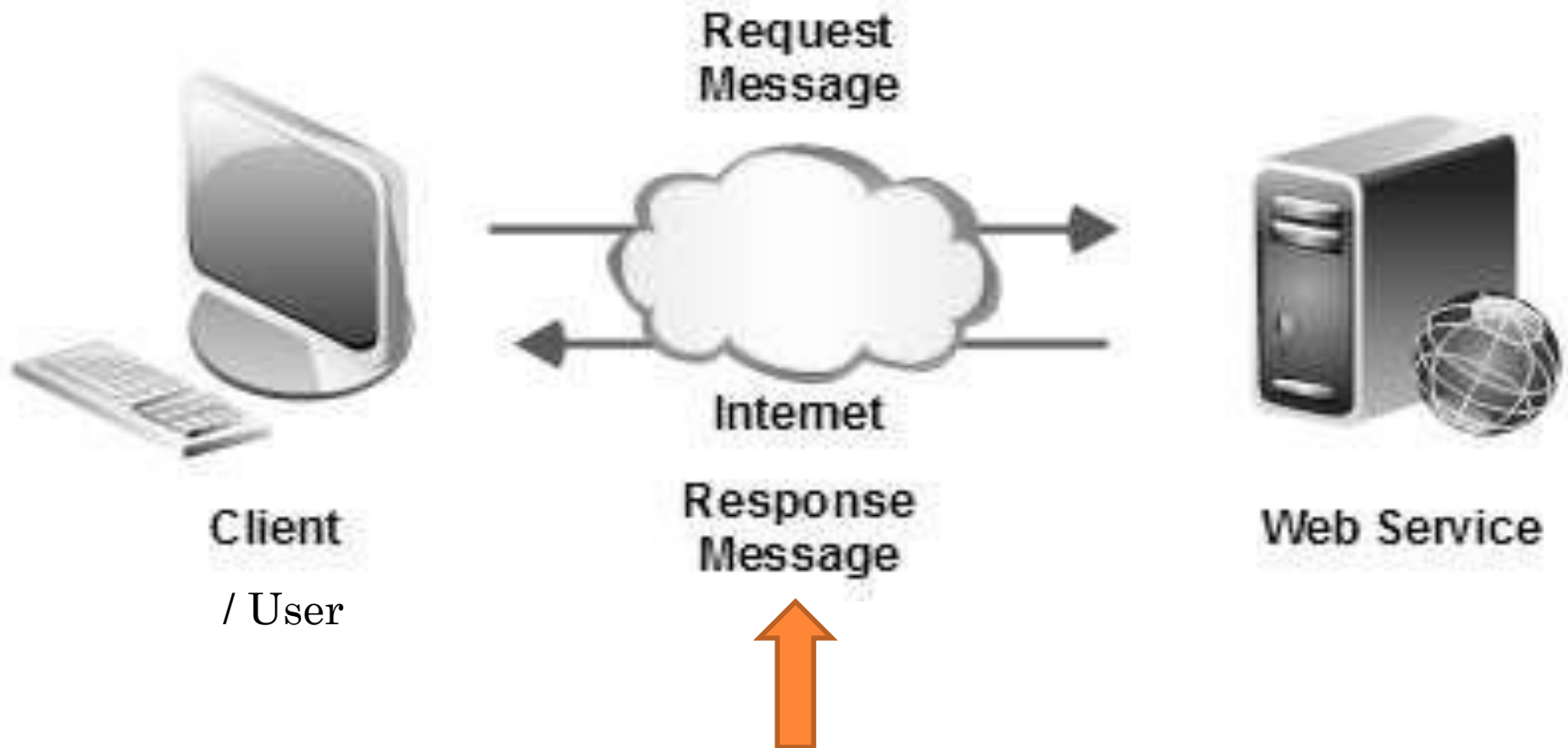
Testing Request & Response of two services

Simple Example of Communication of services-

SOAP Message——transport message protocol (Network layer)

A/C & Mobile no.----XML/SOAP Message/ request

Google Pay → SBI Server/ service

Verify---XML//SOAP Message/ response

GPay- Angular   SBI- Java

Important Terms of Web Service Testing-

Ex. Business need Swiggy order -

1. Location – Geo locator service (Google service)
2. Restaurant – Swiggy Restaurant / menu download service (Swiggy service)
3. Payment – Payment gateway service

Important Terms of Web Service Testing-

Manual Testing	Web service Testing
UI is require/ Frond end	No require any UI/Frond
System & Fun Testing, UI Testing	System & Fun Testing
Application/ Build required for testing	URL / URI (Rest service), WSDL file (SOPA service) required for Testing

Important Terms of Web Service Testing-

XML— extreme mark-up language- Html, Header, Body, Div, Fault

SOAP message (simple object access protocol)— envelope, Header, Body, Fault

WSDL File/Service—data type, elements, message, binding

UDDI– all WSDL file store/ repository

Important Terms of Web Service Testing-

SOAP message (simple object access protocol)—
1. Eenvelope – SOAP Message
2. Header – Service access, authorization
3. Body- main part of SOAP message
4. Fault – Error message

WSDL—data type, elements, message, binding

UDI– all WSDL file store/ repository

Important Terms of Web Service Testing-

WSDL file (Web service descriptive langue's)—
1. Data type – data type of data present in the service
2. Elements - Which operation perform on data
3. Message – Functionality of service, In UDDI location of WSDL file
4. Binding – To combine all service

UDDI (Universal description discovery integration)– all WSDL file store/ repository

EXAMPLES

http://www.xignite.com/xCurrencies.asmx?wsdl

Classification of Web Services-

SOAP Service	REST Service
SOAP stands for **Simple Object Access Protocol**.	REST stands for **Representational State Transfer**.
SOAP services used for **web-based application** only	Rest services used for **web based, Mobile based, Desktop** based application
SOAP services are largely based on XML	REST services use multiple standards like HTTP, JSON, URL, and XML
SOAP uses **XML** for request & response	Rest uses HTTP/URL/ **JSON** for request & response like HTML, Text, **JSON**, XML etc
For testing SOPA service we require **WSDL** file	For testing REST service, we require **URL/ URI**
SOAP (designed) is a **protocol.**	REST (designed) is an **architectural style**.
Performance wise Requires more bandwidth	Requires fewer bandwidth
SOAP supports SSL security	REST supports SSL & HTTPS security
It is taking more time to respond	It is faster for response

Type of Request/ Methods-

S1 **S2**
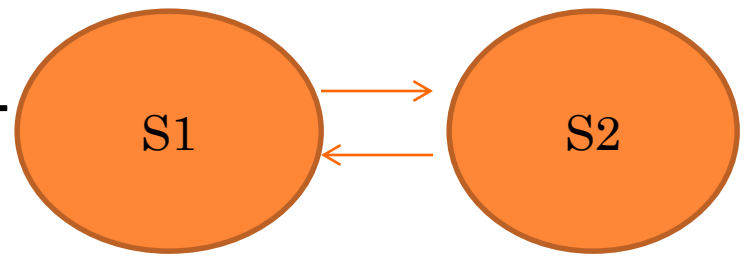
1. **GET Method/ Request-** GET is used to get data from a resource – similar select to statement

2. **POST Method/ Request-** - POST is used to send data to a server to create a resource – Similar Insert to statement

3. **Patch Method/ Request-** Patch requests are to make partial update on a resource - Similar update to statement

4. **PUT Method/ Request-** PUT is used to send data to a server to update a resource - Similar update to statement

5. **DELETE Method/ Request-** The DELETE method deletes the specified resource - Similar delete to statement

Type of Request/ Methods-

Service 1   ------------------   Service 2 (First name, Mob no, Last name, Addre, PAN no, Adhar no)

PUT request- Update only PAN no.
-(First name, Mob no, Last name, Addre, **PAN no**, Aadhar no)
- Slow update

PATCH request- Update only PAN no.
-(**PAN no**)
- Very fast

What is **CRUD-**

Most REST APIs implement <u>CRUD</u>: Create, Retrieve, Update, and Delete.

We can map these operations into CRUD.
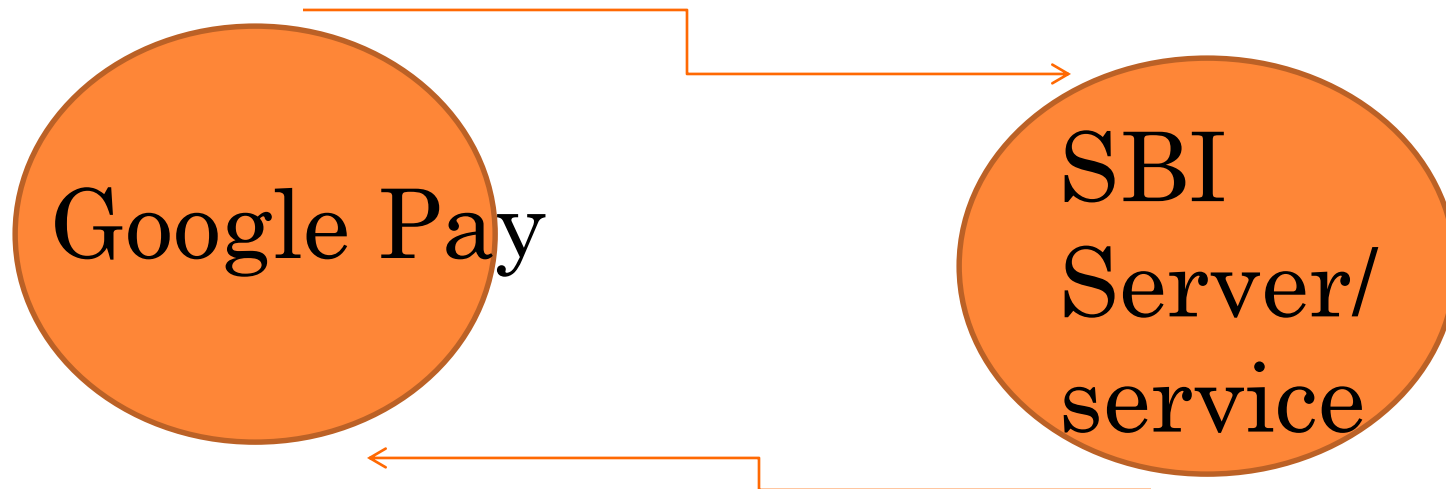POST—Create / Insert
GET—Retrieve
PUT / PATCH—Update
DELETE—Delete

Check balance --- Request/ GET request– read/select

Insert UPI--- Request/ POST request---create

Update UPI ---- Request/Put request -- Update

Google Pay

SBI Server/ service

Delete A/C ---- Request/Delete request – delete

Modify UPI– Request/ Patch request – single update

SO WHAT TO TEST IN WEB SERVICE TESTING ?

1. Validating SOAP/Rest response
2. Validating Data and count of data in response
3. Validating Tagname/Attributes presents in responses
4. Validating Status code in responses
5. Validating Time taken for responses
6. Applying Assertion for verification
7. Validating the Functionality
8. Validating NEGATIVE test cases !

    ex. Available balance = 3000000 Rs

Different status code-

1. Successful responses (2XX)
2. Server errors (4XX)
3. Internal errors (5XX)

Theses status code will define by developer

Successful responses (2XX)	
200 -OK	The request has succeeded. The meaning of the success depends on the HTTP method – ex. GET
201- Created	The request has succeeded and a new resource has been created as a result. This is typically the response sent after POST requests,
202 – Accepted	If data will sent to server for storing purpose- ex. PUT / PATCH
204 - No Content	If unique data sent to server then it sent no content . Ex. POST, PUT, PATCH, DELETE

Server errors (4XX)- Server 2	
400 - Bad Request	The server could not understand the request due to invalid syntax/Data
401 - Unauthorized	If invalid authorization will be provided in request
403 - Forbidden	The client does not have access rights to the content. It will go to some intermediate state.
404 - Not Found	The server can not find the requested resource. In the browser, this means the URL is not recognized.
405 - Method Not Allowed	The request method is known by the server but has been disabled and cannot be used.

internal errors (5XX)- Server 1	
500 - Internal Server Error	The server has encountered a situation it doesn't know how to handle.
501 - Not Implemented	The request method is not supported by the server and cannot be handled.
503 - Service Unavailable	The server is not ready to handle the request. Common causes are a server that is down for maintenance or that is overloaded.

Real example-

GET method-

http://www.xignite.com/xCurrencies.asmx?wsdl

Currency of country- IND, currency - Rupess

Valid HTTP status code – 200 OK Response

timeout !>= 0.5 s

Negative cases (check status):

- incorrect country
- incorrect currency

TOOLS FOR TESTING-

      1. SOAPUI Tool- Soap, Rest full services

      2. POSTMAN Tool – Rest full services

Steps for testing-

1. Open tool
2. Go to file and click on new SOAP request
3. Copy WSDL file link into SOAP request tab & press ok
4. Open one responses
5. Fill the "**?**" place in SOAP request of xml format

SOAP SERVICE & REST METHOD TEST USING SOAPUI TOOL-

Sr. No	Action/ Method	Test Cases	Expected Result	Status code	Pass /Fail
1	Get- http://www .dneonline. com/calcul ator.asmx? wsdl- ADD Service	Verify that SOAP response of respective web service	In response we are getting valid data	200 - ok	P
2		Verify that for invalid SOAP response of respective web service	In response we should get "Bad request"	400 – Bad request	P
3		Verify that SOAP response should contain valid integer no. for valid request of integer no.	Value should be present in integer Ex. 3 + 9 = 12	200 - ok	P
4		Verify that SOAP response should contain invalid integer no. (0.88, one) in request	Response should contain fault messages	400 – Bad request	F

Rest Method Test using Postman tool-

Collection-

▪ Postman Collections are a group of saved requests you can organize into folders

How to lock defect in web service testing-

1. Open tool "JIRA/HPALM"
2. Add description of Defect – Verify that for hitting service for invalid test data response should show '400- bad request' status code
3. Add a picture-
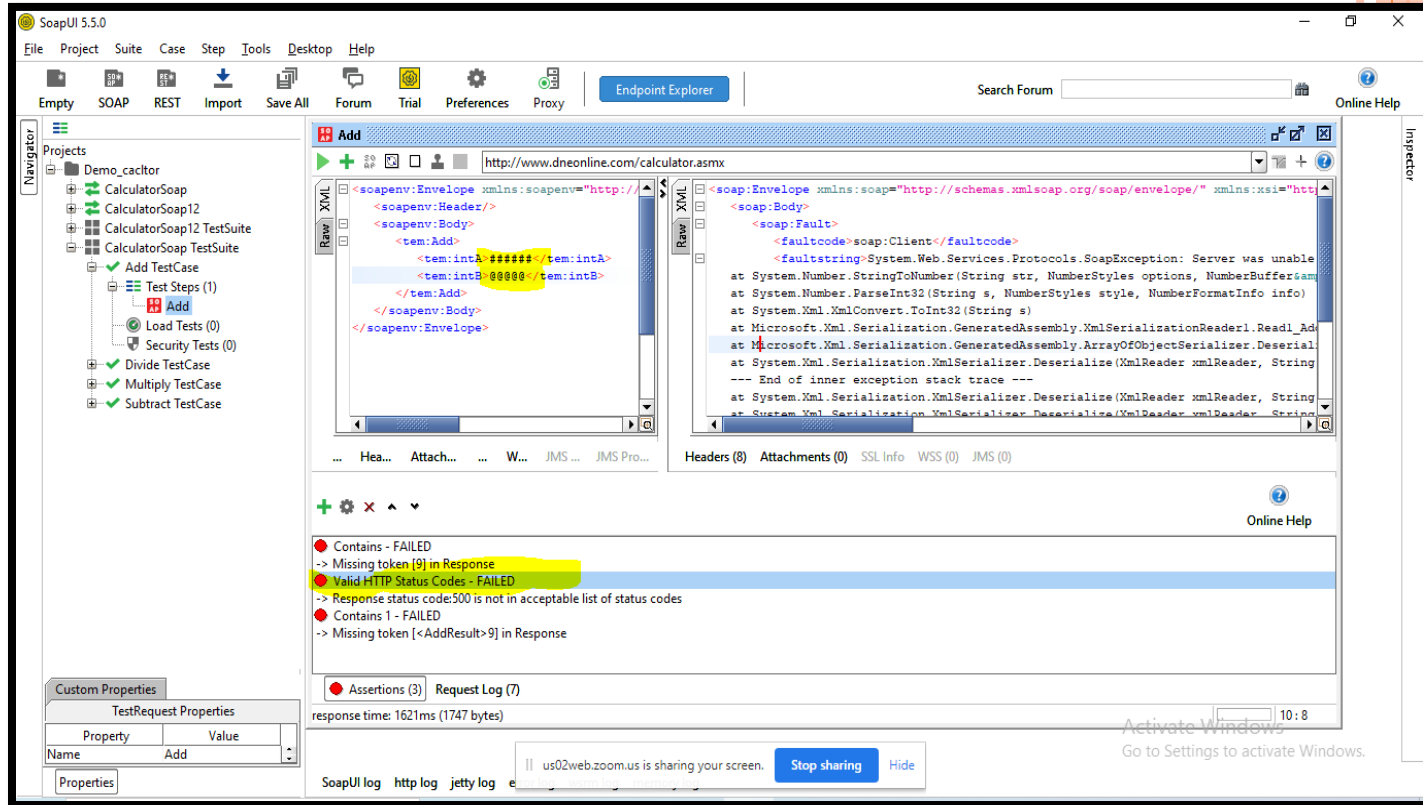
4. Assign defect to developer
5. Sent mail to all team through toolset

File Project Suite Case Step Tools Desktop Help

Empty SOAP REST Import Save All Forum Trial Preferences Proxy

Endpoint Explorer

Search Forum

Online Help

Navigator

Inspector

Projects

Projects
- Demo_cacltor
  - CalculatorSoap
  - CalculatorSoap12
  - CalculatorSoap12 TestSuite
  - CalculatorSoap TestSuite
    - Add TestCase
      - Test Steps (1)
        - Add
      - Load Tests (0)
      - Security Tests (0)
    - Divide TestCase
    - Multiply TestCase
    - Subtract TestCase

Add

http://www.dneonline.com/calculator.asmx

```xml
<soapenv:Envelope xmlns:soapenv="http://
    <soapenv:Header/>
    <soapenv:Body>
        <tem:Add>
            <tem:intA>######</tem:intA>
            <tem:intB>@@@@@</tem:intB>
        </tem:Add>
    </soapenv:Body>
</soapenv:Envelope>
```

```xml
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="htt
    <soap:Body>
        <soap:Fault>
            <faultcode>soap:Client</faultcode>
            <faultstring>System.Web.Services.Protocols.SoapException: Server was unable
    at System.Number.StringToNumber(String str, NumberStyles options, NumberBuffer&am
    at System.Number.ParseInt32(String s, NumberStyles style, NumberFormatInfo info)
    at System.Xml.XmlConvert.ToInt32(String s)
    at Microsoft.Xml.Serialization.GeneratedAssembly.XmlSerializationReader1.Read1_Ad
    at Microsoft.Xml.Serialization.GeneratedAssembly.ArrayOfObjectSerializer.Deserial
    at System.Xml.Serialization.XmlSerializer.Deserialize(XmlReader xmlReader, String
    --- End of inner exception stack trace ---
    at System.Xml.Serialization.XmlSerializer.Deserialize(XmlReader xmlReader, String
    at System.Xml.Serialization.XmlSerializer.Deserialize(XmlReader xmlReader, String
```

... Hea... Attach... ... W... JMS ... JMS Pro...

Headers (8) Attachments (0) SSL Info WSS (0) JMS (0)

Online Help

- Contains - FAILED
- -> Missing token [9] in Response
- Valid HTTP Status Codes - FAILED
- -> Response status code:500 is not in acceptable list of status codes
- Contains 1 - FAILED
- -> Missing token [<AddResult>9] in Response

Assertions (3) Request Log (7)

response time: 1621ms (1747 bytes)

10 : 8

Custom Properties

TestRequest Properties

Property	Value
Name	Add

Properties

SoapUI log http log jetty log e... ... memory log

Tool used in web service testing-

JIRA/ **HPALM**/ TFS tools- new/User Story assign, Defect, test cases --- project management tool

Testing tool for web service- **SOAPUI** , **POSTMAN**

Developer server for storing web service link- **Swagger**, Tomcat server

URL & URI-

URL – uniform resource locator

URI- uniform resource identifier

EX.

[HTTPS://REQRES.IN/API/USERS?PAGE=2](https://reqres.in/api/users?page=2)

WHERE

URL/Domain – [HTTPS://REQRES.IN](https://reqres.in)

URI- [HTTPS://REQRES.IN/API/USERS?PAGE=2](https://reqres.in/api/users?page=2)

URL contains URL & other part

CONTAINS

1. PARAMETERS/RESOURCE→/API/USERS

2. Parameter values/ Query String→after ?

MARK EX. PAGE=2

URI= URL +Resource +Parameter value

Difference between Web Service & API-

Web Service	API
Web service serve as a means of communication	API" stands for **Application Programming Interface**
Web service is used to communicate between two machines over a network	An API used as an interface between two different applications for communicating with each other
Web services require a **Network**	APIs are **Protocol** agnostic
A web service **require** a Network for it's operation	A API service **not require** a Network for it's operation
Web service only support **only XML**	API service only **support XML & JSON**
Web service uses SOAP, REST as a means of communication	API may use any communication to initiate interaction between applications Soap, RESET, RPC, XML-RPC, Resfull Service etc
All web services are APIs	**Not all APIs are web services**
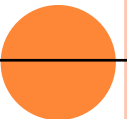
Questions-

1. How much experience you have in web service testing/API?
2. What is difference between SOAP & REST service?
3. How you are tested web service testing/API ? Tell the Process?
4. What you validate in web service testing/API
5. What are different status code & meaning?
6. What are different type of method as GET, POST, PUT, PATCH, DELETE
7. What is procedure for testing web services in POSTMAN Tool.
8. What is difference between URI & URL
9. What is difference between Web service & API
10. What is difference between Authorization& authentication
11. What is ResAssured?-

Ans - API service then I will use ResAssured library for doing Automation.

Questions-

11. Facing problem in API testing?

Ans- 1. Understanding the functionality API

2. Status code are not standard (Becz developers are keeping randomly any status code)

3. Expected result should know as tester, If not know then i will missed defects

12. What is collection?