API LEARNING FULL PICTURE FROM SCRATCH

Simple Web callout:-

Child Class: (Processing) ::
URL defined, Method defined

```
@RestResource(urlMapping='/ContactFetcher/*')

global class childClass {
//information processing
   @HttpGet
   global static List<Contact> childClassMethod(){
      List<Contact> li = [SELECT Id, Name, Phone, Account.Name  FROM Contact];
      System.debug('List of Contact==>' + li);
      return li;
   }

//Data Creating
  /* @HttpPost
   global static List<Contact> childClassMethod2(){
      List<Contact> li = [SELECT Id, Name, Phone, Account.Name  FROM Contact];
      System.debug('List of Contact==>' + li);
      return li;
   }*/
}
```

Target Org Configuration: Child:-
Connected app

1) Client_id
2) Consumer_key
3) OAUTH Policy_ relaxation of ip network

How to prevent connected Auth usage?

Setup > Connected App -> Connected app Oauth usage -> Manage and block

Parent Class: (schedule setup, schedule, batch, state) ::
In batch: Request and Response

For Request: (header and data combined in a wrapper)

For Request:-

1) Endpoint url
2) Method
3) Authorized access token

Note:- Authorized access token, only needed :- If data is not publicly available.
If data is publicly available then directly use **fetch** that's it.

If data is not publicly available and to get Authorized access token, do the authentication:-

For Normal Authentication, Need :-
If data/ API that is publicly available but need client key in parameter

For OAUTH Authentication, Need:-
User name, password, security token, client_id, client_key
In Salesforce for OAUTH Authentication:automatic, manual processes are there.

For Response:

```
System.debug('>>res '+res.getBody());
List<Object> resultMap= (List<Object>)JSON.deserializeUnTyped(res.getBody());
System.debug('resultMap==>' + resultMap);
```

Source Org Configuration: Parent:-
Remote site setting
https://login.salesforce.com
https://brave-bear-1zteug-dev-ed.my.salesforce.com

For Automatic Auth process : Auth Provider and Named credential setting

/* ---------- **OAUTH AUTHENTICATION IN SALESFORCE** ----------*/

// for automatic setup use this mechanism
// Connected App in target org, callback of source org,
// Auth provider is source org, named Cred in source org

// for manual:-
//session id and access url
//set session id and access url on header
//call out

For manual process:

Do Authentication: Need userName, password, Security Token extra.

```
public AuthRes authenticationMethod(){
    Http h = new Http();
    HttpRequest hrequest = new HttpRequest();
    HttpResponse hresponse = new HttpResponse();

    String userName = 'dhanuka.shubham@brave-bear-1zteug.com';
    String password = 'Dhanuka12@hlfGkKHBojlwjpfzaaEF4KbV';
    String client_id = '3MVG9fe4g9fhX0E5aqHBK6CdKceKovLT_TWq1.1jhZ5AbGYcqNvz_x0JjrU3qnn5VAUUdB3xjEkB8oElh4p8o';
    String client_key = 'FB3201A1368CAFE51BDBF93A8897AA6A655F317CCDBBFE3368763F5A29161D8F';

    String auth = 'grant_type=password&client_id='+client_id+'&client_secret='+client_key+'&username='+userName+'&password='+password;
    String endpoint = 'https://login.salesforce.com/services/oauth2/token';

    hrequest.setEndpoint(endpoint);
    hrequest.setMethod('POST');
    hrequest.setBody(auth);

    hresponse = h.send(hrequest);

    if (hresponse.getStatusCode() == 200) {
        System.debug('hresponse ==>'+ hresponse);
        System.debug('response body==>' + hresponse.getBody());
    }
    ParentClass1.AuthRes authRes = new ParentClass1.AuthRes();
    authRes = (AuthRes)JSON.deserialize(hresponse.getBody(),AuthRes.class);
    return authRes;

}
public class AuthRes{
    public string access_token;
    public string instance_url;
    public string id;
    public string token_type;
    public string issued_at;
    public string signature;

}
```

Then in request, set header
req.setHeader('Authorization','Bearer '+authRes.access_token);

For automatic setup use this mechanism:

1) **Define auth provider and Named credentials.**
2) **In end point, Define like this**
   `request.setEndpoint('callout:Apex_Rest_Services_Test/services/apexrest/retrieveDeliveries');`

Then u just need to define set method and send the request

No need to define access token, Named credential and oauth provider will do the job

Example:-

```
Http http = new Http();
HttpRequest request = new HttpRequest();
//Set timeout to 1 minute to avoid read timed out error (only if it appears)
request.setTimeout(60000);
request.setEndpoint('callout:Apex_Rest_Services_Test/services/apexrest/retrieveDeliveries');
request.setMethod('GET');

HttpResponse response = http.send(request);
while (response.getStatusCode() == 302) {
request.setEndpoint(response.getHeader('Location'));
response = new Http().send(request);
}

// If the request is successful, parse the JSON response.
System.debug(response.getBody());
```

Example of Automatic OAUTH in Salesforce:-

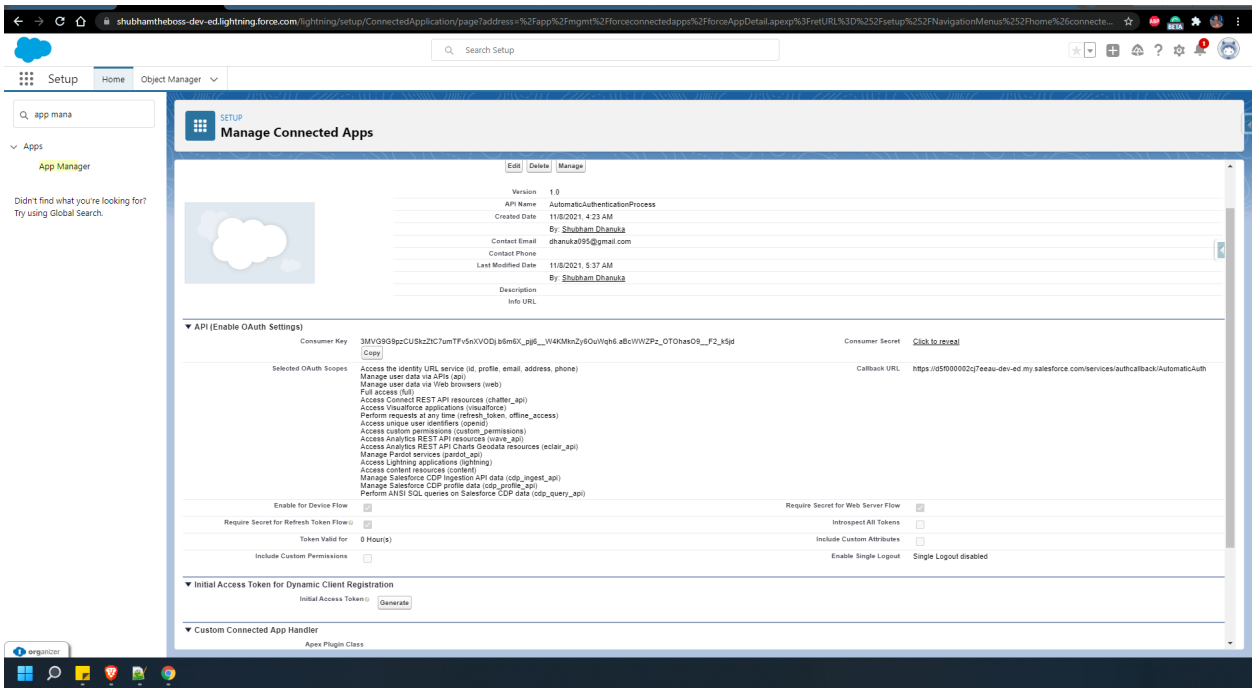
Target Org;-

Code:-

```
@RestResource(urlMapping='/ContactFetcher/*')

global class childClass {
//information processing
   @HttpGet
   global static List<Contact> childClassMethod(){
      List<Contact> li = [SELECT Id, Name, Phone, Account.Name  FROM Contact];
      System.debug('List of Contact==>' + li);
      return li;
   }

}
```

Configuration:- Connected app

Note: callback url must be source auth provider generated url.



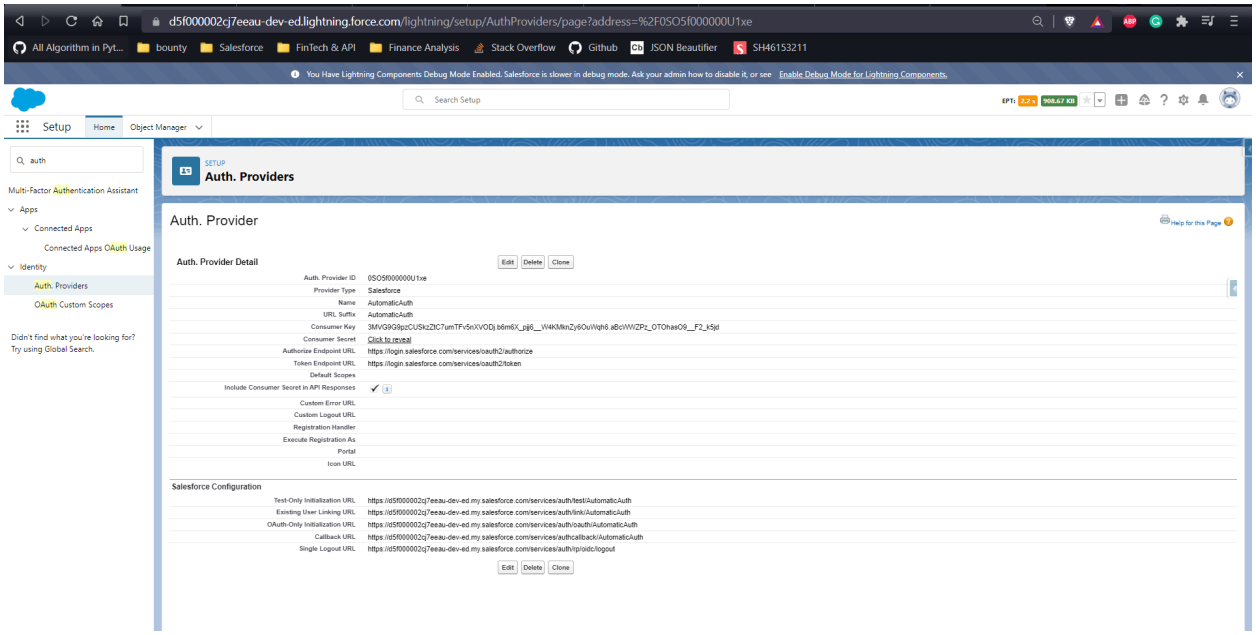
Source Org:-

Code:-

```
global class Webcallout {
   global static void WebcalloutMethod(){
      Http http = new Http();
      HttpRequest request = new HttpRequest();
      request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/');
      request.setMethod('GET');

      HttpResponse response = http.send(request);
      while (response.getStatusCode() == 302) {
         request.setEndpoint(response.getHeader('Location'));
         response = new Http().send(request);
      }
      System.debug('response' + response);
      System.debug(response.getBody());

   }
}
```

Configuration:-

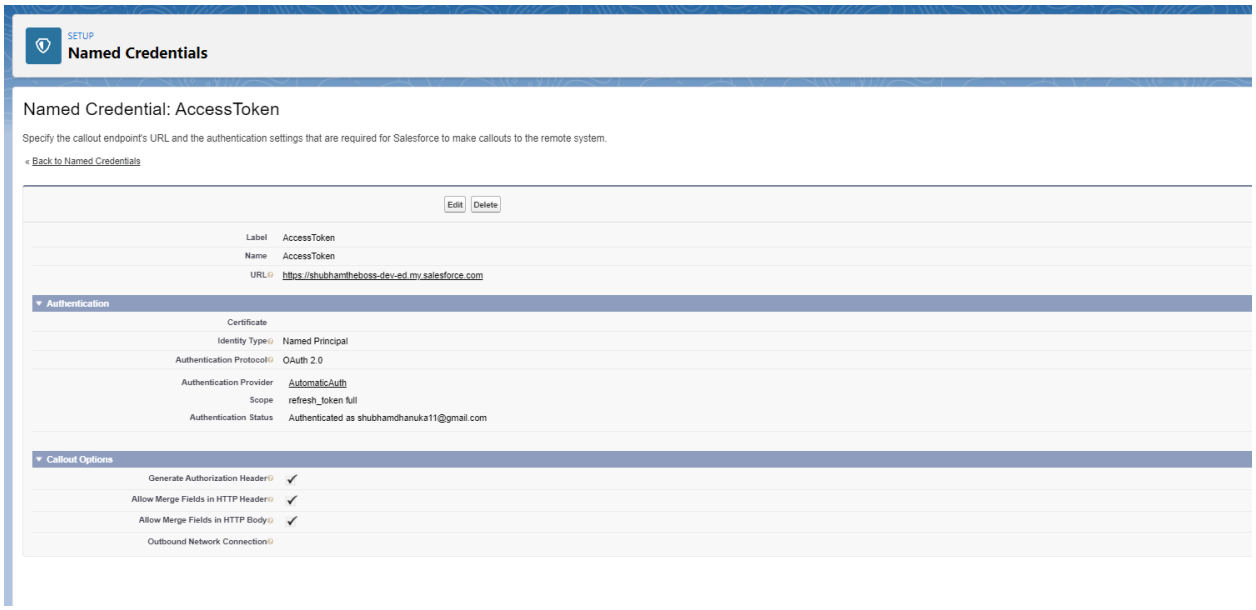
Auth Provider:-



Named Credential:-

Note: https://domain.my.salesforce.com is important

https://github.com/douglascayers-org/sfdx-mass-action-scheduler/wiki/Specify-the-Running-User-via-Named-Credentials



Remote site setting:-

https://login.salesforce.com

https://brave-bear-1zteug-dev-ed.my.salesforce.com

Note:

Remote site setting: site authentic

Auth, Named : Person authentic

Data : data authentic

>>> BASIC OF WEB CALL OUT COMPLETED <<<

Some Useful Terminology:-

1) Remote Site setting :
2) CSP SIte :

3) Auth Provider :
4) Named Credential :

5) Custom Setting :
6) Custom Metadata :

7) Custom Label :
8) Custom URL :

9) REST : (XML + JSON Supported) (WebCallout / HTTP Class)
10) SOAP : (XML Supported) (Web Service) (Partner WSDL)

11) Trusted URL for redirect
12) Outbound connection setting

Serialization and Deserialization process:-

Object to string --> JSON, Serialize

String
Blob --> Binary => (0,1) =>(by using ascii)(bit, byte measurement unit)
Encoding

Decoding
Blob
String

String to object--> JSON Deserialize

```
String str1 = 'b';
Blob b = Blob.valueOf(str1);
System.debug('blob is '+ b);

String paramvalue = EncodingUtil.base64Encode(b);
System.debug('Encoded ' + paramvalue);

blob paramvalue2= EncodingUtil.base64Decode(paramvalue);
System.debug('Decoded blob ' + paramvalue2);

String str2 = paramvalue2.toString();
System.debug('Decoded string ' + str2);
```

Response parsing on parent side:-

To parse the response of json use wrapper class that is the best solution.

JSON TO APEX CONVERSION:-

Class:-

```
public class JSON2Apex {
        public Attributes attributes;
    public Account Account;
        public String Id;
        public String Name;
        public String Phone;
        public String AccountId;

\       public class Attributes {
                public String type;
                public String url;
        }
        public class Account {
                public Attributes attributes;
                public String Id;
                public String Name;
        }

        public static JSON2Apex parse(String json) {
                return (JSON2Apex) System.JSON.deserialize(json, JSON2Apex.class);
        }
}
```

Test Class:-

```
// Generated by JSON2Apex http://json2apex.herokuapp.com/
@IsTest
public class JSON2Apex_Test {

        static testMethod void testParse() {
                String json = '{'+
                '       \"attributes\": {'+
                '           \"type\": \"Contact\",'+
                '           \"url\": \"/services/data/v51.0/sobjects/Contact/0035g000005QA6RAAW\"'+
                '       },'+
                '       \"Id\": \"0035g000005QA6RAAW\",'+
                '       \"Name\": \"Rose Gonzalez\",'+
                '       \"Phone\": \"(512) 757-6000\",'+
                '       \"AccountId\": \"0015g00000Cvck7AAB\",'+
                '       \"Account\": {'+
                '           \"attributes\": {'+
                '               \"type\": \"Account\",'+
                '               \"url\": \"/services/data/v51.0/sobjects/Account/0015g00000Cvck7AAB\"'+
                '           },'+
                '           \"Id\": \"0015g00000Cvck7AAB\",'+
                '           \"Name\": \"Edge Communications\"'+
                '       }'+
                '   }';
                JSON2Apex obj = JSON2Apex.parse(json);
                System.assert(obj != null);
        }
}
```

Uniqueidentifier: server (path)
Classname (defined in resources url) = programme/ folder_name / **class**
Method: **invoking Action method (get, put, post annotation)**
?Q = query **parameter passing**

DATA sending. Passing:-
https://www.salesforcecodecrack.com/2018/12/how-to-read-rest-api-get-parameters.html

Three Ways to pass and send data:-

URL parameter:
URL ID:
Request body:

1) URL parameter:
Query passing in end point ?q=
Parameter passing in end point ?sfgroupId = ''

Query:-
request.setEndpoint('callout:AccessToken/services/data/v53.0/query/?q=SELECT+Name+FROM+Account');

Parameter Passing:-
Target:-

```
request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher?Name=Forbes');
request.setMethod('POST');
request.setHeader('Content-type','application/json');
request.setHeader('Content-Length', '0');
```

Source:-

```
@HttpPost
global static List<Contact> childClassMethod2(){
    RestRequest restReq = RestContext.request;
    RestResponse restRes = RestContext.response;
    //reading entire request body
    //String jsonString = RestContext.request.requestBody.toString();

    // Reading parametrs from URL
    String Name= restReq.params.get('Name');

    List<Contact> li = [select Id, Account.Name, LastName,  Phone from Contact where LastName =:Name];
    System.debug('List of Contact==>' + li);
    return li;
}
```

2) URL ID:

Parameter Passing:-

Target:-

```
request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/0032v000037Ps3mAAC');
request.setMethod('POST');
 request.setHeader('Content-type','application/json');
 request.setHeader('Content-Length', '0');
```

Source:-

```
@HttpPost
global static List<Contact> childClassMethod2(){
    RestRequest restReq = RestContext.request;
    RestResponse restRes = RestContext.response;
    //reading entire request body
    //String jsonString = RestContext.request.requestBody.toString();


    String contactId = restReq.requestURI.substring(restReq.requestURI.lastIndexOf('/') + 1);
    List<Contact> li = [select Id, Account.Name, LastName,  Phone from Contact where Id =:contactId];
    System.debug('List of Contact==>' + li);
    return li;
}
```

3) Request body:

Parameter Passing:- (XML Format)

Target:-

```
request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/');
 request.setMethod('POST');
 request.setHeader('Content-Type', 'application/xml; charset=utf-8');
 request.setHeader('Content-Length', '0');
request.setBody('<?xml version="1.0" encoding="UTF-8" ?><request><lName>'+accName+'</lName></request>');
```

Source:-

```
@HttpPost
global static List<Contact> childClassMethod2(String lName){
    RestRequest restReq = RestContext.request;
    RestResponse restRes = RestContext.response;
    List<Contact> li = [select Id, Account.Name, LastName,  Phone from Contact where LastName =:lName];
    System.debug('List of Contact==>' + li);
    return li;
}
```

3) Request body:

Parameter Passing:- (JSON Format)

Target:-

```
String accName = 'Forbes';

request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/');
request.setMethod('POST');

request.setHeader('Content-Type', 'application/JSON');
request.setHeader('Content-Length', '0');

MyPayload c = new MyPayload();
c.LName = accName;
request.setBody(JSON.serialize(c));

public class MyPayload {
  public String LName;
}
```

Source:-

```
@HttpPost
global static List<Contact> childClassMethod2(String LName){
   List<Contact> li = [select Id, Account.Name, LastName,  Phone from Contact where LastName =:LName];
   System.debug('List of Contact==>' + li);
   return li;
}
```

//Other way to pass the data from target:-

```
request.setBody('{"LName":"Forbes"}');

String accName = '"Forbes"';
request.setBody('{"LName":' +accName+'}');
```

DATA SECURITY: (SAML, JSON Web token)

Data Transformation:

XML and JSON format the data

String encryption and data sending part:-

Object to string --> JSON, Serialize

String
Blob --> Binary => (0,1) =>(by using ascii)(bit, byte measurement unit)
Encoding

Decoding
Blob
string

String to object--> JSON Deserialize

JSON.stringify() ::: object to string :: server always understand string format
JSON.serialize() ::: object to string

JSON.parse() ::: string to Object
JSON.deserialize() ::: string to object

Example:

Parameter Passing:- (JSON Format) (Encoded format)

Target:-

```
String accName = 'Forbes';

request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/');
request.setMethod('POST');
request.setHeader('Content-Type', 'application/JSON');
request.setHeader('Content-Length', '0');

MyPayload c = new MyPayload();
c.LName = accName;
String paramvalue = Encodingutil.base64encode(blob.valueof(JSON.serialize(c)));
request.setBody(paramvalue);
HttpResponse response = http.send(request);

public class MyPayload {
   public String LName;
}
```

Source:-

```
   @HttpPost
   global static List<Contact> childClassMethod2(){
      RestRequest restReq = RestContext.request;
      RestResponse restRes = RestContext.response;

      String jsonString = RestContext.request.requestBody.toString();
      System.debug('jsonString ==>' + jsonString);

      blob paramvalue2= Encodingutil.base64Decode(jsonString);
      String LName2 = paramvalue2.toString();

      MyPayload mp = (MyPayload )System.JSON.deserialize(LName2,MyPayload.class );
      System.debug(mp.LName);

     List<Contact> li = [select Id, Account.Name, LastName,  Phone from Contact where LastName = :mp.LName ];
      System.debug('List of Contact==>' + li);
      return li;
   }
   public class MyPayload {
   public String LName;
}
```

DEBUGGING:-

Tool Useful in development and simulation :

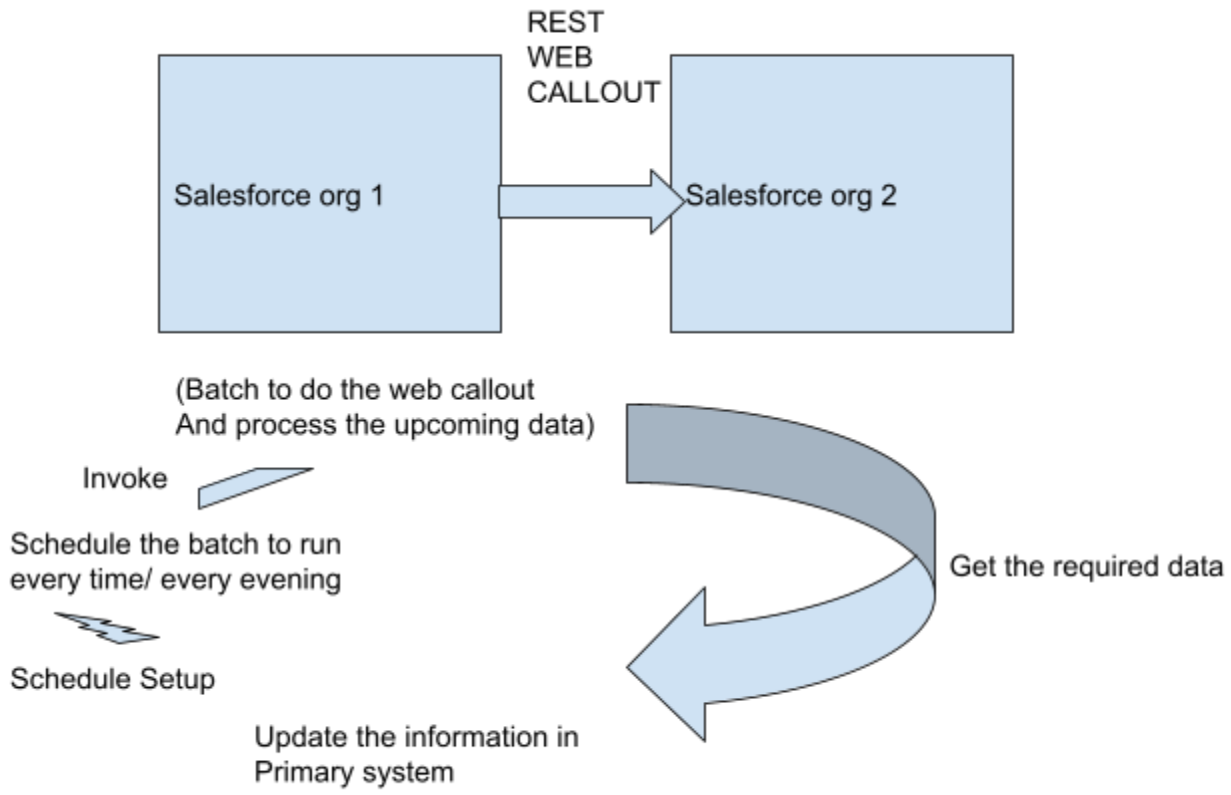
Workbench
SOAP UI
Postman

Troubleshooting:-

pIng/ tracert/ nslookup/ netstat

FULL FLEDGED PROJECT:-

Project of API (including Schedulable, Batch, State, REST Web Callout)



Business UseCase:-

In one org, we have some contact data
In second org, we have some contact data
Need to update in the primary system whose contact matches with secondary org. Just update one custom field call indicator with text "this one already exist in secondary org"

Solution Outline:-

1) **Web callout configuration**
2) **Web callout class**
3) **Response Mock Up Class and Test Web Callout Class**

4) **Batch class**
5) **Test Batch class**

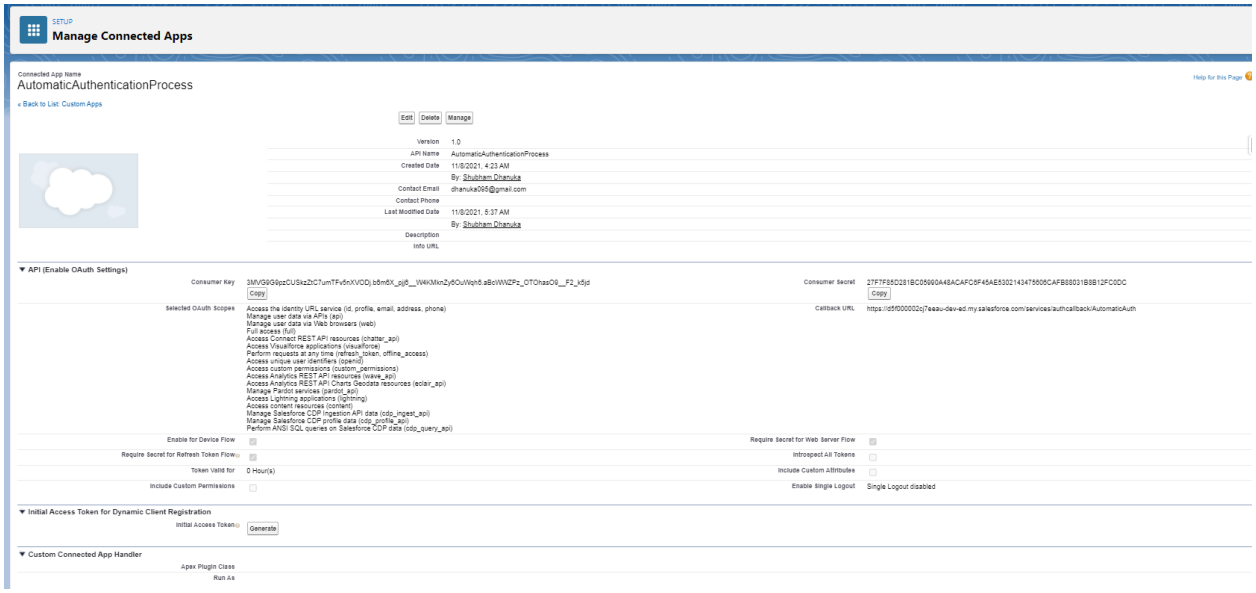
6) **Schedule the class, Test schedule class**

7) **Setup the Schedule Class**
8) **Manage/ Delete the schedule setup**

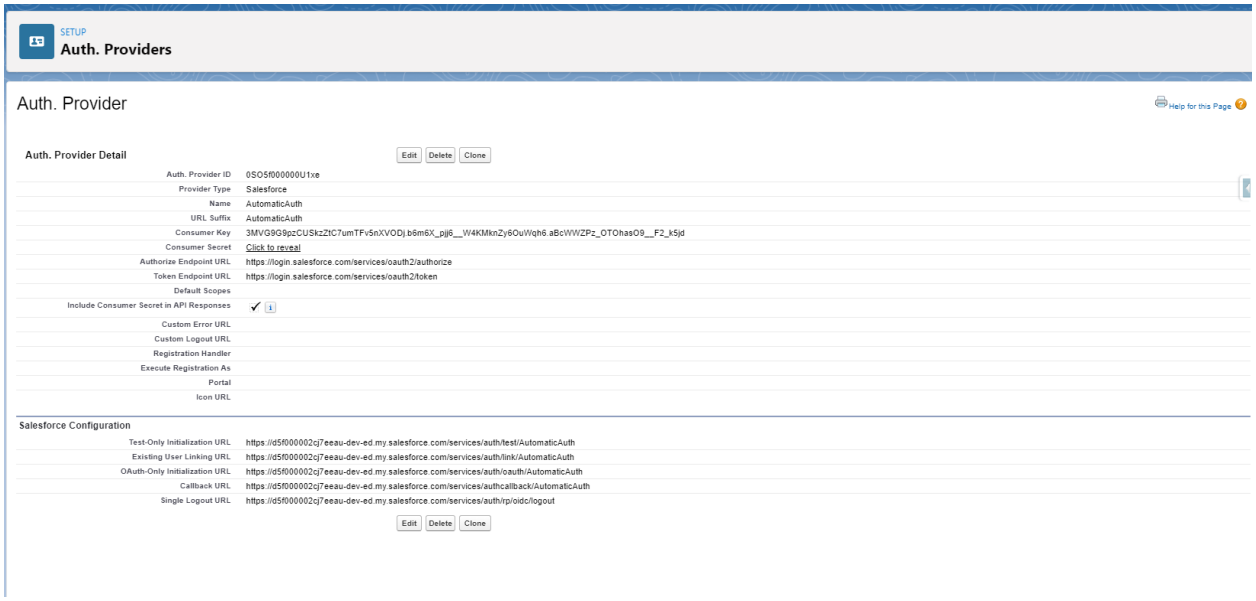
9) **Monitor the batch job**
10) **Delete the batch job**

1) Web Callout Configuration:-FOR Automatic OAUTH Configuration:-

Target Org Configuration:-
Connected APP



Source Org Configuration:-
Auth Provider:-



Named Credential:-

SETUP
Named Credentials

Named Credential: AccessToken

Help for this Page

Specify the callout endpoint's URL and the authentication settings that are required for Salesforce to make callouts to the remote system.

« Back to Named Credentials

Edit | Delete

Label	AccessToken
Name	AccessToken
URL	https://shubhamtheboss-dev-ed.my.salesforce.com

Authentication

Certificate	
Identity Type	Named Principal
Authentication Protocol	OAuth 2.0
Authentication Provider	AutomaticAuth
Scope	refresh_token full
Authentication Status	Authenticated as shubhamdhanuka11@gmail.com

Callout Options

Generate Authorization Header	✓
Allow Merge Fields in HTTP Header	✓
Allow Merge Fields in HTTP Body	✓
Outbound Network Connection	

Remote site settings:-

SETUP
Remote Site Settings

All Remote Sites

Help for this Page

Below is the list of Web addresses that your organization can invoke from salesforce.com. To add another Web address, click New Remote Site.

View: All Remote Sites | Create New View

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Other | All

New Remote Site

Action	Remote Site Name	Namespace Prefix	Remote Site URL	Active	Created By	Created Date	Last Modified By	Last Modified Date
Edit | Del	ApexDevNet	_	http://www.apexdevnet.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	EnableLWCPreview	_	https://d5e000000k0jseas-dev-ed--vlocity-ins.na162.visual.force.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	EnableLWCPreviewLightning	_	https://d5e000000k0jseas-dev-ed.lightning.force.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	SFDC	vlocity_ins	https://example.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	VlocityDocs	vlocity_ins	https://docs-vlocity-help-center.s3.amazonaws.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	VlocityDocsHttps	vlocity_ins	https://docs-vlocity-help-center.s3.amazonaws.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	VlocityLibrary	vlocity_ins	https://vlocity.com	✓	Dhanuka , Shubham	9/14/2021, 7:37 PM	Dhanuka , Shubham	9/14/2021, 7:37 PM
Edit | Del	WebcalloutAuth	_	https://shubhamtheboss-dev-ed.my.salesforce.com	✓	Dhanuka , Shubham	11/8/2021, 5:03 AM	Dhanuka , Shubham	11/8/2021, 5:03 AM
Edit | Del	WebcalloutAuth2	_	https://login.salesforce.com	✓	Dhanuka , Shubham	11/8/2021, 5:06 AM	Dhanuka , Shubham	11/8/2021, 5:06 AM

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Other | All

2) Web callout class:-

1) Target Org Class:-

Rest Class:

```
@RestResource(urlMapping='/ContactFetcher/*')

global class childClass {
//information processing
   @HttpGet
   global static List<Contact> childClassMethod(){
      List<Contact> li = [SELECT Id, Name, Phone, Account.Name  FROM Contact];
      System.debug('List of Contact==>' + li);
      return li;
   }

//Data Creating
  /* @HttpPost
   global static List<Contact> childClassMethod2(){
      List<Contact> li = [SELECT Id, Name, Phone, Account.Name  FROM Contact];
      System.debug('List of Contact==>' + li);
      return li;
   }*/
}
```

2) Source Org Class:-

WebCallout Class:

```
global class Webcallout {
   global static List<String> WebcalloutMethod(){
      List<String> li = new List<String>();

      Http http = new Http();
      HttpRequest request = new HttpRequest();

      request.setEndpoint('callout:AccessToken/services/apexrest/ContactFetcher/');
      request.setMethod('GET');

      HttpResponse response = http.send(request);
      while (response.getStatusCode() == 302) {
         request.setEndpoint(response.getHeader('Location'));
         response = new Http().send(request);
      }

      System.debug('response' + response);
      System.debug('respose is ==> '+response.getBody());
```

```
    List<JSON2Apex> resultMap = (List<JSON2Apex> ) System.JSON.deserialize(response.getBody(),
List<JSON2Apex>.class);
        System.debug('list iteration ==>'+resultMap[0]);

        for (JSON2Apex obj : resultMap){
            //JSON2Apex obj1 = (JSON2Apex) System.JSON.deserializeUnTyped(obj, JSON2Apex.class);
            //System.debug('list iteration ==>'+obj.Name);
            li.add(obj.Name);

        }
        System.debug('size of coming records:-' + li.size());
        System.debug('item in coming list:-' + li);

        return li;
    }
}
```

JSON to Apex Class :-

```
public class JSON2Apex {

        public class Account {
                public Attributes attributes;
        }

        public Attributes attributes;
        public String Id;
        public String Name;
        public String Phone;
        public String AccountId;
        public Account Account;

        public class Attributes {
                public String type;
                public String url;
        }


        public static JSON2Apex parse(String json) {
                return (JSON2Apex) System.JSON.deserialize(json, JSON2Apex.class);
        }
}
```

JSON to Apex Test Class:-

```
@IsTest
public class JSON2Apex_Test {

	static testMethod void testParse() {
		String json = '{'+
		'
\"attributes\":{\"type\":\"Contact\",\"url\":\"/services/data/v53.0/sobjects/Contact/0032v000037
Ps3mAAC\"},'+
		' \"Id\":\"0032v000037Ps3mAAC\",'+
		' \"Name\":\"Sean Forbes\",'+
		' \"Phone\":\"(512) 757-6000\",'+
		' \"AccountId\":\"0012v00002c0vPdAAI\",'+
		'
\"Account\":{\"attributes\":{\"type\":\"Account\",\"url\":\"/services/data/v53.0/sobjects/Account/
0012v00\"}}}';
		JSON2Apex obj = JSON2Apex.parse(json);
		System.assert(obj != null);
	}
}
```

3) Response Mock Up Class and Test Web Callout Class

Mockup

```
@isTest
global class WebCalloutMock implements HttpCalloutMock {
	 String json = '[{'+
		'
\"attributes\":{\"type\":\"Contact\",\"url\":\"/services/data/v53.0/sobjects/Contact/0032v000037Ps3mAA
C\"},'+
		' \"Id\":\"0032v000037Ps3mAAC\",'+
		' \"Name\":\"test\",'+
		' \"Phone\":\"9828185204\",'+
		' \"AccountId\":\"0012v00002c0vPdAAI\",'+
		'
\"Account\":{\"attributes\":{\"type\":\"Account\",\"url\":\"/services/data/v53.0/sobjects/Account/0012v00\
"}}}]';

   global HTTPResponse respond(HTTPRequest request) {
      HttpResponse response = new HttpResponse();
      response.setHeader('Content-Type', 'application/json');
      response.setBody(json);
      response.setStatusCode(200);
      return response;
   }
}
```

Test Web Callout Class:-

```
@istest
public class WebcalloutTest {
   @istest
   static void main(){
      Test.setMock(HttpCalloutMock.class, new WebCalloutMock());
      List<String> strResp = Webcallout.WebcalloutMethod();
      System.debug('List of mock response' + strResp);
   }
}
```

4) Batch class

```
global class FristBathc implements Database.Batchable<Sobject>, Database.AllowsCallouts, Database.Stateful{
   // variable to add the id
   global List<String> ExternalList = new List<String>();

   //Constructor for webcallout
   global FristBathc(){
      ExternalList = Webcallout.WebcalloutMethod();
      System.debug('here is the execution');
      System.debug('here is returned data in batch' + ExternalList);
   }
   // start Method
   global Database.Querylocator start (Database.BatchableContext BC){
      //get list of customer record
      return Database.getQuerylocator('select id, Name, Indicator__c from Contact where Name in :ExternalList ');

   }
   //execute method
   global void execute(Database.BatchableContext BC, List<sobject> scope) {
      //if customer status is active, update customer status and customer discription
      //either you can define it as customer list or you can cast it in iteration: to case Customer c =
(customer__c)scope;
      List<Contact> li = scope;
      System.debug('scope list' + li );
      List<Contact> lic = new List<Contact>();

      for(Contact ac: li){
            ac.Indicator__c = 'yes this one also existing in secondary system';
            lic.add(ac);
      }
      if(lic.size()!=0){
         Database.update(lic);
      }
   }
   //finish method
   global void finish(Database.BatchableContext BC) {
      //send an email to customer
        }
}
```

5) Test Batch class:-

```
@istest
public class firstbatchtest {
   //Apex provides the built-in WebServiceMock interface and the Test.setMock method.
   @istest
   static void main(){
      Test.setMock(HttpCalloutMock.class, new WebCalloutMock());
      List<String> strResp = Webcallout.WebcalloutMethod();
      System.debug('response in test' + strResp);

      Contact con = new Contact();
      con.LastName = 'test';
      insert con;
      List <Contact> ua = [select Id, Phone, Indicator__c  from Contact where Name in :strResp
LIMIT 1];
      System.debug('resonse going' + ua);

      Test.startTest();

      FristBathc  BD = new FristBathc();
      BD.start(null);
      BD.execute(null, ua);
      BD.finish(null);
      //Database.executeBatch(BD);
      Test.stopTest();



      //System.assertEquals('7230882125', ua.Phone);

   }
}
```

6) Schedule the class and test schedule class:-

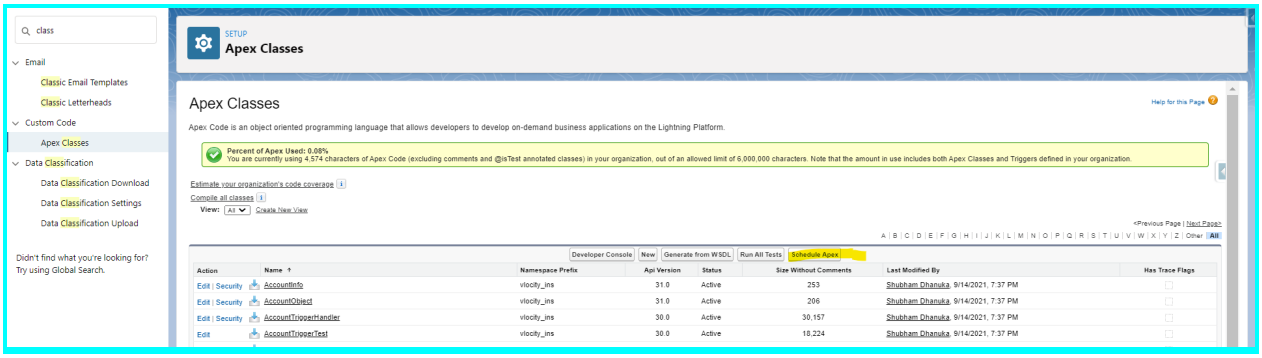
Class:-

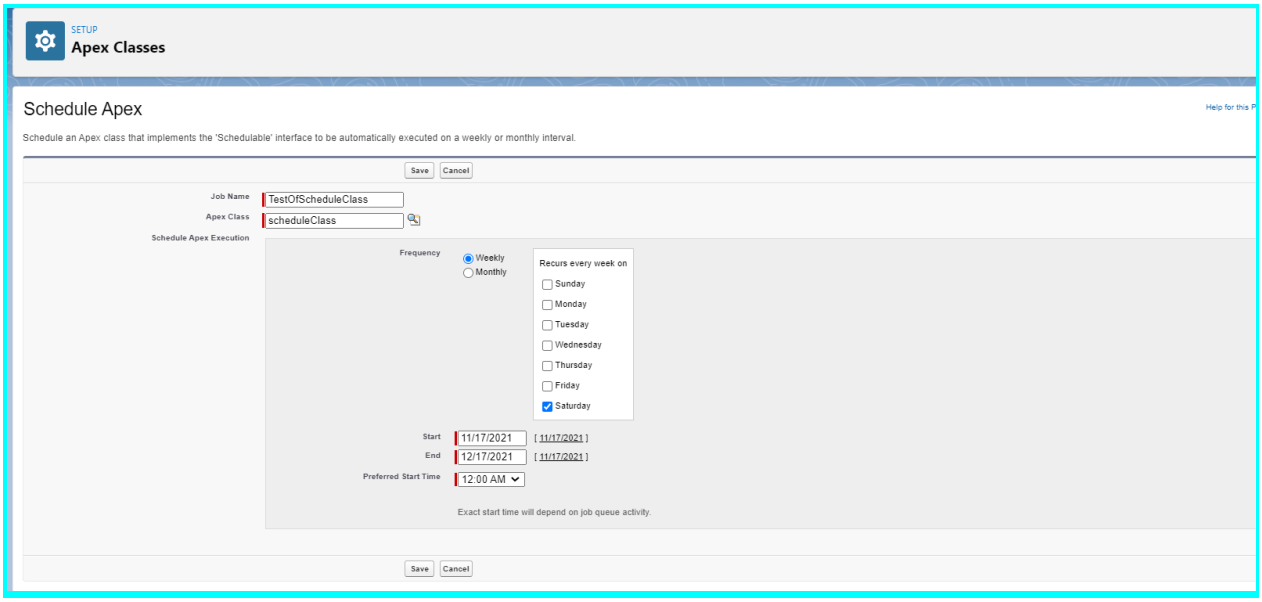
```
global class scheduleClass implements schedulable{
   global void execute(SchedulableContext SC){
      FristBathc  BD = new FristBathc();
      Database.executeBatch(BD);
   }
}
```

TestClass:-

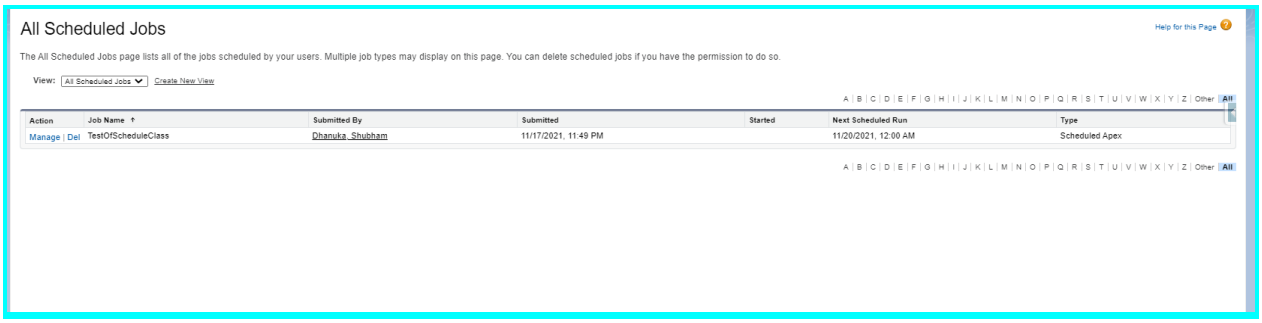
```
@isTest
public class scheduleClassTest {
@isTest
   static void main (){
      Test.StartTest();
      scheduleClass sc = new scheduleClass();
      //sc.execute();
      String sch = '0 0 23 * * ?';
      system.schedule('Test', sch, sc);

      Test.stopTest();
   }
}
```

7) Setup the schedule:

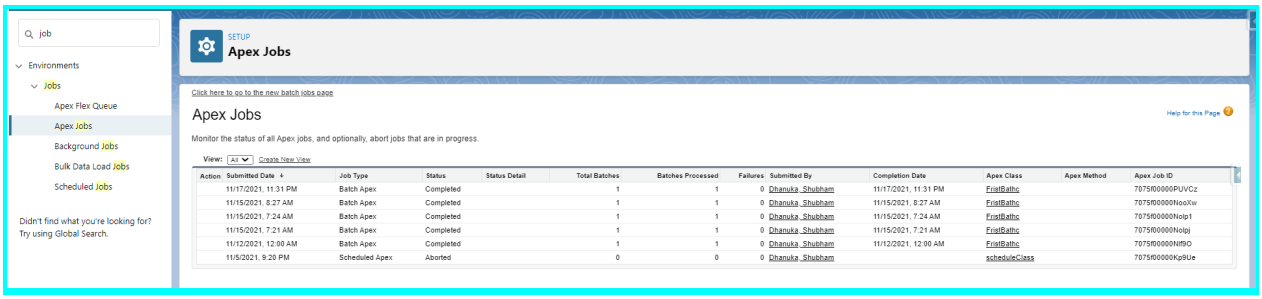




8) Manage/ Delete the schedule setup:-



9) Monitor the batch job:-



10) Delete the batch job:-

Query:-

```
SELECT ApexClassId,CompletedDate,CreatedById,CreatedDate,ExtendedStatus,Id,JobItemsProcessed,JobType,LastProcessed,LastProcessedOffset,MethodName,NumberOfErrors,ParentJobId,Status,TotalJobItems FROM AsyncApexJob where status = 'queued'
```

```
System.abortJob('JobID');
```

Few practical exam of parsing :-

```
// Online Javascript Editor for free
// Write, Edit and Run your Javascript code using JS Online Compiler

console.log("Welcome to Programiz!");



let columns = [
   { label: 'Contact Name', fieldName: 'ContactName' },
   { label: 'Contact Phone', fieldName: 'ContactPhone', type: 'phone' },
   { label: 'Contact Email', fieldName: 'ContactEmail' },
   { label: 'Contact Language', fieldName: 'ContactLanguage' },
 ];
console.log(JSON.stringify(columns));
column = JSON.stringify(columns);
console.log(JSON.parse(column));
console.log('<------------>>');

headers=[];
parms_headers = 'Name, Email';
parms_headers.split(',').forEach((item,i)=>{
        var x = {};
        x.label =i;
        x.fieldName = item.trim();
        headers.push(x);
});
console.log('Headers:'+JSON.stringify(headers));
console.log('<------------>>');
```

```
headers=[];
parms_label = 'Contact Name, Contact Phone';
parms_fieldName = 'ContactName, ContactPhone';
array_label = parms_label.split(",");
array_fieldName = parms_fieldName.split(",");
console.log(array_label);
console.log(array_fieldName);



parms_label.split(',').forEach((item,i)=>{
        var x = {};
        x.label =array_label [i].trim();
        x.fieldName = array_fieldName[i].trim();
        headers.push(x);
});
console.log('Headers:'+ JSON.stringify(headers));
head= JSON.stringify(headers);
console.log(JSON.parse(head));
```

```
node /tmp/PfLrputo2o.js
Welcome to Programiz!
[{"label":"Contact Name","fieldName":"ContactName"},{"label":"Contact Phone","fieldName":"ContactPhone"
    ,"type":"phone"},{"label":"Contact Email","fieldName":"ContactEmail"},{"label":"Contact Language"
    ,"fieldName":"ContactLanguage"}]
[ { label: 'Contact Name', fieldName: 'ContactName' },
  { label: 'Contact Phone',
    fieldName: 'ContactPhone',
    type: 'phone' },
  { label: 'Contact Email', fieldName: 'ContactEmail' },
  { label: 'Contact Language', fieldName: 'ContactLanguage' } ]
<------------->>
Headers:[{"label":0,"fieldName":"Name"},{"label":1,"fieldName":"Email"}]
<------------->>
[ 'Contact Name', ' Contact Phone' ]
[ 'ContactName', ' ContactPhone' ]
Headers:[{"label":"Contact Name","fieldName":"ContactName"},{"label":"Contact Phone","fieldName"
    :"ContactPhone"}]
[ { label: 'Contact Name', fieldName: 'ContactName' },
  { label: 'Contact Phone', fieldName: 'ContactPhone' } ]
```

Some practical exam to learn and work:-

How to do json parsing using json parser class and wrapper class:-

Main class:-

```
public class JSONParsing {
    public static void responseDataParsing(){
        String str =
'[{"invoiceList":[{"totalPrice":5.5,"statementDate":"2011-10-04T16:58:54.8
58Z","lineItems":[{"UnitPrice":1.0,"Quantity":5.0,"ProductName":"Pencil"},
{"UnitPrice":0.5,"Quantity":1.0,"ProductName":"Eraser"}],"invoiceNumber":1
},{"totalPrice":11.5,"statementDate":"2011-10-04T16:58:54.858Z","lineItems
":[{"UnitPrice":6.0,"Quantity":1.0,"ProductName":"Notebook"},{"UnitPrice":
2.5,"Quantity":1.0,"ProductName":"Ruler"},{"UnitPrice":1.5,"Quantity":2.0,
"ProductName":"Pen"}],"invoiceNumber":2}]}]';
        JSONParser parser = JSON.createParser(str);
        System.debug('response' + parser);
        Double grandTotal = 0.0;
        while (parser.nextToken() != null) {
            if ((parser.getCurrentToken() == JSONToken.FIELD_NAME) &&
                (parser.getText() == 'totalPrice')) {
                    // Get the value.
                    parser.nextToken();
                    // Compute the grand total price for all invoices.
                    grandTotal += parser.getDoubleValue();
                }
        }
        system.debug('Grand total=' + grandTotal);
        /*
JSON2Apex obj = JSON2Apex.parse(str);
System.debug('obj' + obj);
System.debug('obj' + obj.InvoiceList);
//System.assert(obj != null);
for (Object o : obj.InvoiceList){
System.debug('indivivual data' + o);
}*/
        Double sum = 0;
        List<JSON2Apex> resultMap =
(List<JSON2Apex>)System.JSON.deserialize(str, List<JSON2Apex>.class);
        for (JSON2Apex obj : resultMap){
            for(JSON2Apex.InvoiceList il : obj.InvoiceList ){
                //System.debug(''+ il.totalprice);
                sum = sum + il.totalprice;
            }
            //li.add(obj.Name);
        }
        System.debug('sum' + sum);           }
}
```

Reference JSON2Apex class:-

```
public class JSON2Apex {
 public class LineItems {
  public Double UnitPrice;
  public Double Quantity;
  public String ProductName;
 }

 public List<InvoiceList> invoiceList;

 public class InvoiceList {
  public Double totalPrice;
  public String statementDate;
  public List<LineItems> lineItems;
  public Integer invoiceNumber;
 }


 public static JSON2Apex parse(String json) {
  return (JSON2Apex) System.JSON.deserialize(json, JSON2Apex.class);
 }
}
```

Encoded and decoded the value :-

```
public class LearningOfSpecificConcept {
    public static void main (){

        String str = String.valueOf(System.TODAY());
        System.debug('Date is ' + str);
        System.debug('Today' + System.TODAY());

        String str1 = 'b';
        Blob b = Blob.valueOf(str1);
        System.debug('blob is '+ b);

        String paramvalue = EncodingUtil.base64Encode(b);
        System.debug('Encoded ' + paramvalue);

        blob paramvalue2= EncodingUtil.base64Decode(paramvalue);
        System.debug('Decoded blob ' + paramvalue2);

        String str2 = paramvalue2.toString();
        System.debug('Decoded string ' + str2);
    }
}
```

How to write JSON class and get the data from user and proceed
And pass the data back to request 👍

```
@RestResource(urlMapping='/ContactFetcher/*')

global class childClass {
//information processing
    @HttpGet
    global static List<Contact> childClassMethod(){
        List<Contact> li = [select Id, LastName,  Phone from Contact];
        System.debug('List of Contact==>' + li);
        return li;
    }
    @HttpPost
    global static List<Contact> childClassMethod2(){
        RestRequest restReq = RestContext.request;
        RestResponse restRes = RestContext.response;
        //reading entire request body
        String jsonString = RestContext.request.requestBody.toString();
        System.debug('jsonString ==>' + jsonString);
        // Reading parametrs from URL
        //String Name= restReq.params.get('Name');
        blob paramvalue2= Encodingutil.base64Decode(jsonString);
        String LName2 = paramvalue2.toString();

        MyPayload mp = (MyPayload
)System.JSON.deserialize(LName2,MyPayload.class );
        System.debug(mp.LName);

        List<Contact> li = [select Id, Account.Name, LastName,  Phone from
Contact where LastName = :mp.LName ];
        System.debug('List of Contact==>' + li);
        return li;
    }
    public class MyPayload {
    public String LName;
}

}
```