# Salesforce Developer - Self Learning : *Complete 100%*

1. Salesforce Fundamentals and User Setup
2. Relationships & ProcessAutomation
3. Flows & Security
4. Apex, Testing And Debugging
5. LWC
6. Visual Force and Integration

## Apex Specialist -SuperBadge : *100%*

1. Apex Triggers

### 1.1 Bulk Apex Triggers :-

```
        trigger ClosedOpportunityTrigger on Opportunity (after insert, after update) {

  List<Task> taskList = new List<Task>();

  for(Opportunity opp : Trigger.new) {

                //Only create Follow Up Task only once when Opp StageName is to 'Closed Won'
on Create
                if(Trigger.isInsert) {
                        if(Opp.StageName == 'Closed Won') {
                                taskList.add(new Task(Subject = 'Follow Up Test Task', WhatId =
opp.Id));
                        }
                }

                //Only create Follow Up Task only once when Opp StageName changed to
'Closed Won' on Update
                if(Trigger.isUpdate) {
                        if(Opp.StageName == 'Closed Won'
                                        && Opp.StageName != Trigger.oldMap.get(opp.Id).StageName) {
                                                taskList.add(new Task(Subject = 'Follow Up Test Task', WhatId =
opp.Id));
                                        }
                                }
    }

    if(taskList.size()>0) {
        insert taskList;
    }
```

1.2 Get Started With Apex Triggers:-

```
        trigger AccountAddressTrigger on Account (before insert, before update) {

    for(Account a : Trigger.new){
        If (a.Match_Billing_Address__c == true) {
            a.ShippingPostalCode = a.BillingPostalCode;
        }
    }

}
```

2. Apex Testing

2.1 Create Test Data for Apex Testing:-

```
                public class RandomContactFactory{

    public static List<Contact> generateRandomContacts(integer n,string LastName){
    integer n1=n;
    List<contact> c1 = new list<contact>();
    list<contact> c2 =new list<contact>();
     c1 = [select FirstName from Contact Limit : n1];
     integer i=0;
     for(contact cnew : c1){
     contact cnew1 = new contact();
     cnew1.firstname = cnew.firstname + i;
     c2.add(cnew1);
     i++;
     }
    return c2;

    }
}
```

### 2.2 Get Started With Apex Unit Tests:-

```
 @isTest
private class TestVerifyDate {
    static testMethod void TestVerifyDate() {
      VerifyDate.CheckDates(System.today(),System.today().addDays(10));
       VerifyDate.CheckDates(System.today(),System.today().addDays(78));
    }
}
```

### 2.3 Test Apex Triggers:-

```
            //class
trigger RestrictContactByName on Contact (before insert, before update) {
    //check contacts prior to insert or update for invalid data
    For (Contact c : Trigger.New) {
        if(c.LastName == 'INVALIDNAME') {   //invalidname is invalid
            c.AddError('The Last Name "'+c.LastName+'" is not allowed for DML');
        }
    }
}
//Test class
@isTest
private class TestRestrictContactByName {

    static testMethod void  metodoTest()
    {

        List<Contact> listContact= new List<Contact>();
        Contact c1 = new Contact(FirstName='Francesco', LastName='Riggio' ,
email='Test@test.com');
        Contact c2 = new Contact(FirstName='Francesco1', LastName =
'INVALIDNAME',email='Test@test.com');
        listContact.add(c1);
        listContact.add(c2);

        Test.startTest();
          try
          {
            insert listContact;
          }
          catch(Exception ee)
          {
          }

        Test.stopTest();

    }

}
```

## 3. Asynchronous Apex

### 3.1 Controlable Process with Queueable Apex:-

```
                public class AddPrimaryContact implements Queueable
{
    private Contact c;
    private String state;
    public  AddPrimaryContact(Contact c, String state)
    {
        this.c = c;
        this.state = state;
    }
    public void execute(QueueableContext context)
    {
         List<Account> ListAccount = [SELECT ID, Name ,(Select id,FirstName,LastName from
contacts ) FROM ACCOUNT WHERE BillingState = :state LIMIT 200];
         List<Contact> lstContact = new List<Contact>();
         for (Account acc:ListAccount)
         {
                 Contact cont = c.clone(false,false,false,false);
                 cont.AccountId =  acc.id;
                 lstContact.add( cont );
        }

        if(lstContact.size() >0 )
        {
           insert lstContact;
        }

    }

}
//-----------------------------------------test class------------------------------------------------------------------

@isTest
public class AddPrimaryContactTest
{
     @isTest static void TestList()
     {
         List<Account> Teste = new List <Account>();
         for(Integer i=0;i<50;i++)
         {
            Teste.add(new Account(BillingState = 'CA', name = 'Test'+i));
         }
         for(Integer j=0;j<50;j++)
         {
            Teste.add(new Account(BillingState = 'NY', name = 'Test'+j));
         }
         insert Teste;

         Contact co = new Contact();
         co.FirstName='demo';
         co.LastName ='demo';
         insert co;
         String state = 'CA';

          AddPrimaryContact apc = new AddPrimaryContact(co, state);
          Test.startTest();
            System.enqueueJob(apc);
          Test.stopTest();
      }
 }
```
## 3.2 Schedule Jobs Using Apex Scheduler :-

```
          global class DailyLeadProcessor implements Schedulable {

   global void execute(SchedulableContext ctx) {
      List<Lead> lList = [Select Id, LeadSource from Lead where LeadSource = null];

      if(!lList.isEmpty()) {
                        for(Lead l: lList) {
                              l.LeadSource = 'Dreamforce';
                        }
                        update lList;
                  }
   }
}


//-----------------test class-----------------

@isTest
private class DailyLeadProcessorTest {
          static testMethod void testDailyLeadProcessor() {
                    String CRON_EXP = '0 0 1 * * ?';
                    List<Lead> lList = new List<Lead>();
             for (Integer i = 0; i < 200; i++) {
                              lList.add(new Lead(LastName='Dreamforce'+i, Company='Test1 Inc.',
Status='Open - Not Contacted'));
                    }
                    insert lList;

                    Test.startTest();
                    String jobId = System.schedule('DailyLeadProcessor', CRON_EXP, new
DailyLeadProcessor());
          }
}
```

## 3.3 Use Batch Apex:-

```
           //--------Batch job-------------
global class LeadProcessor implements Database.Batchable<Sobject>
```

```
{
   global Database.QueryLocator start(Database.BatchableContext bc)
   {
      return Database.getQueryLocator([Select LeadSource From Lead ]);
   }

   global void execute(Database.BatchableContext bc, List<Lead> scope)
   {
         for (Lead Leads : scope)
         {
            Leads.LeadSource = 'Dreamforce';
         }
      update scope;
   }

   global void finish(Database.BatchableContext bc){   }
}
```

```
//--------------Test class-----------------
@isTest
public class LeadProcessorTest
{
   static testMethod void testMethod1()
   {
      Lead[] lstLead = new Lead[0];
      for(Integer i=0 ;i <200;i++)
      {
         Lead led = new Lead();
         led.FirstName ='FirstName';
         led.LastName ='LastName'+i;
         led.Company ='demo'+i;
         lstLead.add(led);
      }

      insert lstLead;
```

```
        Test.startTest();

        LeadProcessor l = new LeadProcessor();
        Database.executeBatch(l);

        Test.stopTest();
    }
}
```

## 3.4 Use Future Methods :-

```
            public class AccountProcessor
{
@future
public static void countContacts(Set<id> setId)
{
List<Account> lstAccount = [select id,Number_of_Contacts__c , (select id fromcontacts ) from
account where id in :setId ];
for( Account acc : lstAccount )
{
List<Contact> lstCont = acc.contacts ;

acc.Number_of_Contacts__c = lstCont.size();
}
update lstAccount;
}
}

//-------------test  class-------------


@IsTest
public class AccountProcessorTest {
public static testmethod void TestAccountProcessorTest()
{
Account a = new Account();
a.Name = 'Test Account';
Insert a;
Contact cont = New Contact();
cont.FirstName ='Bob';
cont.LastName ='Masters';
cont.AccountId = a.Id;
Insert cont;

set<Id> setAccId = new Set<ID>();
setAccId.add(a.id);

Test.startTest();
AccountProcessor.countContacts(setAccId);
Test.stopTest();

Account ACC = [select Number_of_Contacts__c from Account where id = :a.id LIMIT 1];
System.assertEquals ( Integer.valueOf(ACC.Number_of_Contacts__c) ,1);
}

}
```

## 4. Apex Integration Services

### 4.1 Apex REST Callouts:-

```
public class AnimalLocator{
   public static String getAnimalNameById(Integer x){
      Http http = new Http();
      HttpRequest req = new HttpRequest();
      req.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/' + x);
      req.setMethod('GET');

      HttpResponse res = http.send(req);
         if (response.getStatusCode() == 200) {
      Map<String, Object> results = (Map<String,
Object>)JSON.deserializeUntyped(res.getBody());
      Map<String, Object> animal = (Map<String, Object>) results.get('animal');
      return (String)animal.get('name');

}
   }
}
```

```
//Mock Response Class -
@isTest
global class AnimalLocatorMock implements HttpCalloutMock {
     // Implement this interface method
    global HTTPResponse respond(HTTPRequest request) {
        // Create a fake response
        HttpResponse response = new HttpResponse();
        response.setHeader('Content-Type', 'application/json');
        response.setBody('{"animals": ["majestic badger", "fluffy bunny", "scary bear",
"chicken", "mighty moose"]}');
        response.setStatusCode(200);
        return response;
    }
}
//Test Class -

@isTest
private class AnimalLocatorTest{
    @isTest static void AnimalLocatorMock1() {
        Test.setMock(HttpCalloutMock.class, new AnimalLocatorMock());
        string result = AnimalLocator.getAnimalNameById(3);
        String expectedResult = 'chicken';
        System.assertEquals(result,expectedResult );
    }
}
```

## 4.2 Apex Soap Callouts :-

```
        public class ParkLocator {
    public static string[] country(String country) {
        parkService.parksImplPort park = new parkService.parksImplPort();
        return park.byCountry(country);
    }
}
//Generated by wsdl2apex

public class ParkService {
    public class byCountryResponse {
        public String[] return_x;
        private String[] return_x_type_info = new String[]{'return','http://parks.services/',null,'0','-
1','false'};
        private String[] apex_schema_type_info = new String[]{'http://parks.services/','false','false'};
        private String[] field_order_type_info = new String[]{'return_x'};
    }
    public class byCountry {
        public String arg0;
        private String[] arg0_type_info = new String[]{'arg0','http://parks.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new String[]{'http://parks.services/','false','false'};
        private String[] field_order_type_info = new String[]{'arg0'};
    }
    public class ParksImplPort {
        public String endpoint_x = 'https://th-apex-soap-service.herokuapp.com/service/parks';
        public Map<String,String> inputHttpHeaders_x;
        public Map<String,String> outputHttpHeaders_x;
        public String clientCertName_x;
        public String clientCert_x;
        public String clientCertPasswd_x;
        public Integer timeout_x;
        private String[] ns_map_type_info = new String[]{'http://parks.services/', 'ParkService'};
        public String[] byCountry(String arg0) {
            ParkService.byCountry request_x = new ParkService.byCountry();
            request_x.arg0 = arg0;
            ParkService.byCountryResponse response_x;
            Map<String, ParkService.byCountryResponse> response_map_x = new Map<String,
ParkService.byCountryResponse>();
            response_map_x.put('response_x', response_x);
            WebServiceCallout.invoke(
              this,
              request_x,
              response_map_x,
              new String[]{endpoint_x,
              '',
              'http://parks.services/',
              'byCountry',
              'http://parks.services/',
              'byCountryResponse',
              'ParkService.byCountryResponse'}
            );
            response_x = response_map_x.get('response_x');
            return response_x.return_x;
        }
    }
}
@isTest
private class ParkLocatorTest {
    @isTest static void testCallout() {
        // This causes a fake response to be generated
        Test.setMock(WebServiceMock.class, new ParkServiceMock());
        // Call the method that invokes a callout
        //Double x = 1.0;
        //Double result = AwesomeCalculator.add(x, y);

        String country = 'Germany';
        String[] result = ParkLocator.Country(country);


        // Verify that a fake result is returned
        System.assertEquals(new List<String>{'Hamburg Wadden Sea National Park', 'Hainich
National Park', 'Bavarian Forest National Park'}, result);
    }
}
@isTest
global class ParkServiceMock implements WebServiceMock {
   global void doInvoke(
           Object stub,
           Object request,
           Map<String, Object> response,
           String endpoint,
           String soapAction,
           String requestName,
           String responseNS,
           String responseName,
           String responseType) {
        // start - specify the response you want to send
        parkService.byCountryResponse response_x = new parkService.byCountryResponse();
        response_x.return_x = new List<String>{'Hamburg Wadden Sea National Park', 'Hainich
National Park', 'Bavarian Forest National Park'};

        //calculatorServices.doAddResponse response_x = new
calculatorServices.doAddResponse();
        //response_x.return_x = 3.0;
        // end
        response.put('response_x', response_x);
    }
}
```

## 4.3 Apex Web Services :-

```
        @RestResource(urlMapping='/Accounts/*/contacts')
global class AccountManager {
    @HttpGet
    global static Account getAccount() {
        RestRequest req = RestContext.request;
        String accId = req.requestURI.substringBetween('Accounts/', '/contacts');
        Account acc = [SELECT Id, Name, (SELECT Id, Name FROM Contacts)
                       FROM Account WHERE Id = :accId];
        return acc;
    }
}
//TEST CLASS
@isTest
private class AccountManagerTest {

    private static testMethod void getAccountTest1() {
        Id recordId = createTestRecord();
        // Set up a test request
        RestRequest request = new RestRequest();
        request.requestUri = 'https://na1.salesforce.com/services/apexrest/Accounts/'+ recordId
+'/contacts' ;
        request.httpMethod = 'GET';
        RestContext.request = request;
        // Call the method to test
        Account thisAccount = AccountManager.getAccount();
        // Verify results
        System.assert(thisAccount != null);
        System.assertEquals('Test record', thisAccount.Name);

    }

    // Helper method
        static Id createTestRecord() {
        // Create test record
        Account TestAcc = new Account(
          Name='Test record');
        insert TestAcc;
        Contact TestCon= new Contact(
        LastName='Test',
        AccountId = TestAcc.id);
        return TestAcc.Id;
    }
}
```

## 5.Test Automation Logic

```
##MaintenanceRequestHelperTest.apxc :-
@istest
public with sharing class MaintenanceRequestHelperTest {

    private static final string STATUS_NEW = 'New';
    private static final string WORKING = 'Working';
    private static final string CLOSED = 'Closed';
    private static final string REPAIR = 'Repair';
    private static final string REQUEST_ORIGIN = 'Web';
    private static final string REQUEST_TYPE = 'Routine Maintenance';
    private static final string REQUEST_SUBJECT = 'Testing subject';

    PRIVATE STATIC Vehicle__c createVehicle(){
        Vehicle__c Vehicle = new Vehicle__C(name = 'SuperTruck');
        return Vehicle;
    }

    PRIVATE STATIC Product2 createEq(){
        product2 equipment = new product2(name = 'SuperEquipment',
                                         lifespan_months__C = 10,
                                         maintenance_cycle__C = 10,
                                         replacement_part__c = true);
        return equipment;
    }

    PRIVATE STATIC Case createMaintenanceRequest(id vehicleId, id equipmentId){
        case cs = new case(Type=REPAIR,
                    Status=STATUS_NEW,
                    Origin=REQUEST_ORIGIN,
                    Subject=REQUEST_SUBJECT,
                    Equipment__c=equipmentId,
                    Vehicle__c=vehicleId);
        return cs;
    }

    PRIVATE STATIC Equipment_Maintenance_Item__c createWorkPart(id equipmentId,id
requestId){
        Equipment_Maintenance_Item__c wp = new
Equipment_Maintenance_Item__c(Equipment__c = equipmentId,
                                                                            Maintenance_Request__c = requestId);
        return wp;
    }


    @istest
    private static void testMaintenanceRequestPositive(){
        Vehicle__c vehicle = createVehicle();
        insert vehicle;
        id vehicleId = vehicle.Id;

        Product2 equipment = createEq();
        insert equipment;
        id equipmentId = equipment.Id;

        case somethingToUpdate = createMaintenanceRequest(vehicleId,equipmentId);
        insert somethingToUpdate;

        Equipment_Maintenance_Item__c workP =
createWorkPart(equipmentId,somethingToUpdate.id);
        insert workP;

        test.startTest();
        somethingToUpdate.status = CLOSED;
        update somethingToUpdate;
        test.stopTest();

        Case newReq = [Select id, subject, type, Equipment__c, Date_Reported__c, Vehicle__c,
Date_Due__c
```

```
            from case
            where status =:STATUS_NEW];

    Equipment_Maintenance_Item__c workPart = [select id
                                    from Equipment_Maintenance_Item__c
                                    where Maintenance_Request__c =:newReq.Id];

    system.assert(workPart != null);
    system.assert(newReq.Subject != null);
    system.assertEquals(newReq.Type, REQUEST_TYPE);
    SYSTEM.assertEquals(newReq.Equipment__c, equipmentId);
    SYSTEM.assertEquals(newReq.Vehicle__c, vehicleId);
    SYSTEM.assertEquals(newReq.Date_Reported__c, system.today());
}

@istest
private static void testMaintenanceRequestNegative(){
    Vehicle__C vehicle = createVehicle();
    insert vehicle;
    id vehicleId = vehicle.Id;

    product2 equipment = createEq();
    insert equipment;
    id equipmentId = equipment.Id;

    case emptyReq = createMaintenanceRequest(vehicleId,equipmentId);
    insert emptyReq;

    Equipment_Maintenance_Item__c workP = createWorkPart(equipmentId, emptyReq.Id);
    insert workP;

    test.startTest();
    emptyReq.Status = WORKING;
    update emptyReq;
    test.stopTest();

    list<case> allRequest = [select id
                        from case];

    Equipment_Maintenance_Item__c workPart = [select id
                                    from Equipment_Maintenance_Item__c
```

```
                                        where Maintenance_Request__c = :emptyReq.Id];

        system.assert(workPart != null);
        system.assert(allRequest.size() == 1);
    }

    @istest
    private static void testMaintenanceRequestBulk(){
        list<Vehicle__C> vehicleList = new list<Vehicle__C>();
        list<Product2> equipmentList = new list<Product2>();
        list<Equipment_Maintenance_Item__c> workPartList = new
list<Equipment_Maintenance_Item__c>();
        list<case> requestList = new list<case>();
        list<id> oldRequestIds = new list<id>();

        for(integer i = 0; i < 300; i++){
           vehicleList.add(createVehicle());
            equipmentList.add(createEq());
        }
        insert vehicleList;
        insert equipmentList;

        for(integer i = 0; i < 300; i++){
            requestList.add(createMaintenanceRequest(vehicleList.get(i).id, equipmentList.get(i).id));
        }
        insert requestList;

        for(integer i = 0; i < 300; i++){
            workPartList.add(createWorkPart(equipmentList.get(i).id, requestList.get(i).id));
        }
        insert workPartList;

        test.startTest();
        for(case req : requestList){
            req.Status = CLOSED;
            oldRequestIds.add(req.Id);
        }
        update requestList;
        test.stopTest();

        list<case> allRequests = [select id
```

```
                        from case
                        where status =: STATUS_NEW];

      list<Equipment_Maintenance_Item__c> workParts = [select id
                                            from Equipment_Maintenance_Item__c
                                            where Maintenance_Request__c in: oldRequestIds];

      system.assert(allRequests.size() == 300);
   }
}
```

============================================================================================================================

```
##MaintenanceRequestHelper.apxc :-
public with sharing class MaintenanceRequestHelper {
   public static void updateworkOrders(List<Case> updWorkOrders, Map<Id,Case>
nonUpdCaseMap) {
      Set<Id> validIds = new Set<Id>();


      For (Case c : updWorkOrders){
         if (nonUpdCaseMap.get(c.Id).Status != 'Closed' && c.Status == 'Closed'){
            if (c.Type == 'Repair' || c.Type == 'Routine Maintenance'){
               validIds.add(c.Id);



            }
         }
      }

      if (!validIds.isEmpty()){
         List<Case> newCases = new List<Case>();
         Map<Id,Case> closedCasesM = new Map<Id,Case>([SELECT Id, Vehicle__c,
Equipment__c, Equipment__r.Maintenance_Cycle__c,(SELECT Id,Equipment__c,Quantity__c
FROM Equipment_Maintenance_Items__r)
                                             FROM Case WHERE Id IN :validIds]);
         Map<Id,Decimal> maintenanceCycles = new Map<ID,Decimal>();
         AggregateResult[] results = [SELECT Maintenance_Request__c,
MIN(Equipment__r.Maintenance_Cycle__c)cycle FROM Equipment_Maintenance_Item__c
WHERE Maintenance_Request__c IN :ValidIds GROUP BY Maintenance_Request__c];

      for (AggregateResult ar : results){
         maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal) ar.get('cycle'));
      }

         for(Case cc : closedCasesM.values()){
            Case nc = new Case (
               ParentId = cc.Id,
            Status = 'New',
               Subject = 'Routine Maintenance',
               Type = 'Routine Maintenance',
               Vehicle__c = cc.Vehicle__c,
               Equipment__c =cc.Equipment__c,
               Origin = 'Web',
               Date_Reported__c = Date.Today()

            );

            If (maintenanceCycles.containskey(cc.Id)){
               nc.Date_Due__c = Date.today().addDays((Integer) maintenanceCycles.get(cc.Id));
            }

            newCases.add(nc);
         }

        insert newCases;

        List<Equipment_Maintenance_Item__c> clonedWPs = new
List<Equipment_Maintenance_Item__c>();
        for (Case nc : newCases){
            for (Equipment_Maintenance_Item__c wp :
closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items__r){
               Equipment_Maintenance_Item__c wpClone = wp.clone();
               wpClone.Maintenance_Request__c = nc.Id;
```

```
                    ClonedWPs.add(wpClone);

                }
            }
            insert ClonedWPs;
        }
    }
}
```

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##MaintenanceRequest.apxt :-

```
trigger MaintenanceRequest on Case (before update, after update) {
    if(Trigger.isUpdate && Trigger.isAfter){
        MaintenanceRequestHelper.updateWorkOrders(Trigger.New, Trigger.OldMap);
    }
}
```

## 6. Test Callout Logic

### WarehouseCalloutService.apxc :-

```
public with sharing class WarehouseCalloutService {

    private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';

    //@future(callout=true)
    public static void runWarehouseEquipmentSync(){

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

        request.setEndpoint(WAREHOUSE_URL);
        request.setMethod('GET');
        HttpResponse response = http.send(request);


        List<Product2> warehouseEq = new List<Product2>();

        if (response.getStatusCode() == 200){
            List<Object> jsonResponse =
(List<Object>)JSON.deserializeUntyped(response.getBody());
            System.debug(response.getBody());

            for (Object eq : jsonResponse){
                Map<String,Object> mapJson = (Map<String,Object>)eq;
                Product2 myEq = new Product2();
                myEq.Replacement_Part__c = (Boolean) mapJson.get('replacement');
                myEq.Name = (String) mapJson.get('name');
                myEq.Maintenance_Cycle__c = (Integer) mapJson.get('maintenanceperiod');
                myEq.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
                myEq.Cost__c = (Decimal) mapJson.get('lifespan');
                myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
                myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
                warehouseEq.add(myEq);
            }

            if (warehouseEq.size() > 0){
                upsert warehouseEq;
                System.debug('Your equipment was synced with the warehouse one');
                System.debug(warehouseEq);
            }

        }
    }
}
```
==============================================================================
============================================

WarehouseCalloutServiceTest.apxc :-

```
@isTest
```

```
private class WarehouseCalloutServiceTest {
   @isTest
   static void testWareHouseCallout(){
      Test.startTest();
      // implement mock callout test here
      Test.setMock(HTTPCalloutMock.class, new WarehouseCalloutServiceMock());
      WarehouseCalloutService.runWarehouseEquipmentSync();
      Test.stopTest();
      System.assertEquals(1, [SELECT count() FROM Product2]);
   }
}
```

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WarehouseCalloutServiceMock.apxc :-

```
@isTest
global class WarehouseCalloutServiceMock implements HttpCalloutMock {
   // implement http mock callout
   global static HttpResponse respond(HttpRequest request){

      System.assertEquals('https://th-superbadge-apex.herokuapp.com/equipment',
request.getEndpoint());
      System.assertEquals('GET', request.getMethod());

      // Create a fake response
      HttpResponse response = new HttpResponse();
      response.setHeader('Content-Type', 'application/json');

response.setBody('[{"_id":"55d66226726b611100aaf741","replacement":false,"quantity":5,"name":
"Generator 1000 kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"}]');
      response.setStatusCode(200);
      return response;
   }
}
```

## 7.Test Scheduling Logic

WarehouseSyncSchedule.apxc :-

```
global class WarehouseSyncSchedule implements Schedulable {
  global void execute(SchedulableContext ctx) {

    WarehouseCalloutService.runWarehouseEquipmentSync();
  }
}
```

==========================================================================================================================================

## WarehouseSyncScheduleTest.apxc :-

```
@isTest
public class WarehouseSyncScheduleTest {

  @isTest static void WarehousescheduleTest(){
    String scheduleTime = '00 00 01 * * ?';
    Test.startTest();
    Test.setMock(HttpCalloutMock.class, new WarehouseCalloutServiceMock());
    String jobID=System.schedule('Warehouse Time To Schedule to Test', scheduleTime, new
WarehouseSyncSchedule());
    Test.stopTest();
    //Contains schedule information for a scheduled job. CronTrigger is similar to a cron job on
UNIX systems.
    // This object is available in API version 17.0 and later.
    CronTrigger a=[SELECT Id FROM CronTrigger where NextFireTime > today];
    System.assertEquals(jobID, a.Id,'Schedule ');



  }
}
```

## 8. Automate Record Creation

//MaintenanceRequest.apxt

```
trigger MaintenanceRequest on Case (before update, after update) {
   if(Trigger.isUpdate && Trigger.isAfter){
      MaintenanceRequestHelper.updateWorkOrders(Trigger.New, Trigger.OldMap);
   }
}
================================================================================
==========================================
```

//MaintenanceRequestHelper.apxc

```
public with sharing class MaintenanceRequestHelper {
   public static void updateworkOrders(List<Case> updWorkOrders, Map<Id,Case>
nonUpdCaseMap) {
      Set<Id> validIds = new Set<Id>();
      For (Case c : updWorkOrders){
         if (nonUpdCaseMap.get(c.Id).Status != 'Closed' && c.Status == 'Closed'){
            if (c.Type == 'Repair' || c.Type == 'Routine Maintenance'){
               validIds.add(c.Id);
            }
         }
      }

          if (!validIds.isEmpty()){
         Map<Id,Case> closedCases = new Map<Id,Case>([SELECT Id, Vehicle__c, Equipment__c,
Equipment__r.Maintenance_Cycle__c,
                                             (SELECT Id,Equipment__c,Quantity__c FROM
Equipment_Maintenance_Items__r)
                                             FROM Case WHERE Id IN :validIds]);
         Map<Id,Decimal> maintenanceCycles = new Map<ID,Decimal>();
```

```
        AggregateResult[] results = [SELECT Maintenance_Request__c,
                                 MIN(Equipment__r.Maintenance_Cycle__c)cycle
                                 FROM Equipment_Maintenance_Item__c
                                 WHERE Maintenance_Request__c IN :ValidIds GROUP BY
Maintenance_Request__c];

        for (AggregateResult ar : results){
           maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal)
ar.get('cycle'));
        }

        List<Case> newCases = new List<Case>();
        for(Case cc : closedCases.values()){
           Case nc = new Case (
              ParentId = cc.Id,
              Status = 'New',
              Subject = 'Routine Maintenance',
              Type = 'Routine Maintenance',
              Vehicle__c = cc.Vehicle__c,
              Equipment__c =cc.Equipment__c,
              Origin = 'Web',
              Date_Reported__c = Date.Today()
           );



           If (maintenanceCycles.containskey(cc.Id)){
              nc.Date_Due__c = Date.today().addDays((Integer) maintenanceCycles.get(cc.Id));
           } else {
              nc.Date_Due__c = Date.today().addDays((Integer)
cc.Equipment__r.maintenance_Cycle__c);
           }

           newCases.add(nc);
        }

        insert newCases;

        List<Equipment_Maintenance_Item__c> clonedList = new
List<Equipment_Maintenance_Item__c>();
```

```
         for (Case nc : newCases){
            for (Equipment_Maintenance_Item__c clonedListItem :
closedCases.get(nc.ParentId).Equipment_Maintenance_Items__r){
               Equipment_Maintenance_Item__c item = clonedListItem.clone();
               item.Maintenance_Request__c = nc.Id;
               clonedList.add(item);
            }
         }
         insert clonedList;
      }
   }
}




public with sharing class MaintenanceRequestHelper {
   public static void updateworkOrders(List<Case> updWorkOrders, Map<Id,Case>
nonUpdCaseMap) {
      Set<Id> validIds = new Set<Id>();
      For (Case c : updWorkOrders){
         if (nonUpdCaseMap.get(c.Id).Status != 'Closed' && c.Status == 'Closed'){
            if (c.Type == 'Repair' || c.Type == 'Routine Maintenance'){
               validIds.add(c.Id);
            }
         }
      }



      if (!validIds.isEmpty()){
         Map<Id,Case> closedCases = new Map<Id,Case>([SELECT Id, Vehicle__c, Equipment__c,
Equipment__r.Maintenance_Cycle__c,
                                             (SELECT Id,Equipment__c,Quantity__c FROM
Equipment_Maintenance_Items__r)
                                             FROM Case WHERE Id IN :validIds]);
         Map<Id,Decimal> maintenanceCycles = new Map<ID,Decimal>();

         AggregateResult[] results = [SELECT Maintenance_Request__c,
                              MIN(Equipment__r.Maintenance_Cycle__c)cycle
                              FROM Equipment_Maintenance_Item__c
```

```
                                WHERE Maintenance_Request__c IN :ValidIds GROUP BY
Maintenance_Request__c];

         for (AggregateResult ar : results){
            maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal)
ar.get('cycle'));
         }

         List<Case> newCases = new List<Case>();
         for(Case cc : closedCases.values()){
            Case nc = new Case (
               ParentId = cc.Id,
               Status = 'New',
               Subject = 'Routine Maintenance',
               Type = 'Routine Maintenance',
               Vehicle__c = cc.Vehicle__c,
               Equipment__c =cc.Equipment__c,
               Origin = 'Web',
               Date_Reported__c = Date.Today()
            );



            If (maintenanceCycles.containskey(cc.Id)){
               nc.Date_Due__c = Date.today().addDays((Integer) maintenanceCycles.get(cc.Id));
            } else {
               nc.Date_Due__c = Date.today().addDays((Integer)
cc.Equipment__r.maintenance_Cycle__c);
            }

            newCases.add(nc);
         }

         insert newCases;

         List<Equipment_Maintenance_Item__c> clonedList = new
List<Equipment_Maintenance_Item__c>();
         for (Case nc : newCases){
            for (Equipment_Maintenance_Item__c clonedListItem :
closedCases.get(nc.ParentId).Equipment_Maintenance_Items__r){
```

```
                    Equipment_Maintenance_Item__c item = clonedListItem.clone();
                    item.Maintenance_Request__c = nc.Id;
                    clonedList.add(item);
                }
            }
            insert clonedList;
        }
    }
}
```

## 9. Schedule Syncronization

### Schedulable:-

```
global with sharing class WarehouseSyncSchedule implements Schedulable{
    global void execute(SchedulableContext ctx){
        System.enqueueJob(new WarehouseCalloutService());
    }
}
```

## 10. Synchronize Salesforce Data with an External System

```
public with sharing class WarehouseCalloutService implements Queueable {
    private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';



    @future(callout=true)
    public static void runWarehouseEquipmentSync(){
        System.debug('go into runWarehouseEquipmentSync');
        Http http = new Http();
        HttpRequest request = new HttpRequest();

        request.setEndpoint(WAREHOUSE_URL);
        request.setMethod('GET');
        HttpResponse response = http.send(request);

        List<Product2> product2List = new List<Product2>();
        System.debug(response.getStatusCode());
        if (response.getStatusCode() == 200){
            List<Object> jsonResponse =
    (List<Object>)JSON.deserializeUntyped(response.getBody());
            System.debug(response.getBody());


            for (Object jR : jsonResponse){
                Map<String,Object> mapJson = (Map<String,Object>)jR;
                Product2 product2 = new Product2();

                product2.Replacement_Part__c = (Boolean) mapJson.get('replacement');

                product2.Cost__c = (Integer) mapJson.get('cost');

                product2.Current_Inventory__c = (Double) mapJson.get('quantity');

                product2.Lifespan_Months__c = (Integer) mapJson.get('lifespan');

                product2.Maintenance_Cycle__c = (Integer) mapJson.get('maintenanceperiod');

                product2.Warehouse_SKU__c = (String) mapJson.get('sku');

                product2.Name = (String) mapJson.get('name');
                product2.ProductCode = (String) mapJson.get('_id');
                product2List.add(product2);
            }

            if (product2List.size() > 0){
                upsert product2List;
                System.debug('Your equipment was synced with the warehouse one');
            }
        }
    }


    public static void execute (QueueableContext context){
        System.debug('start runWarehouseEquipmentSync');
        runWarehouseEquipmentSync();
        System.debug('end runWarehouseEquipmentSync');
    }

}
```

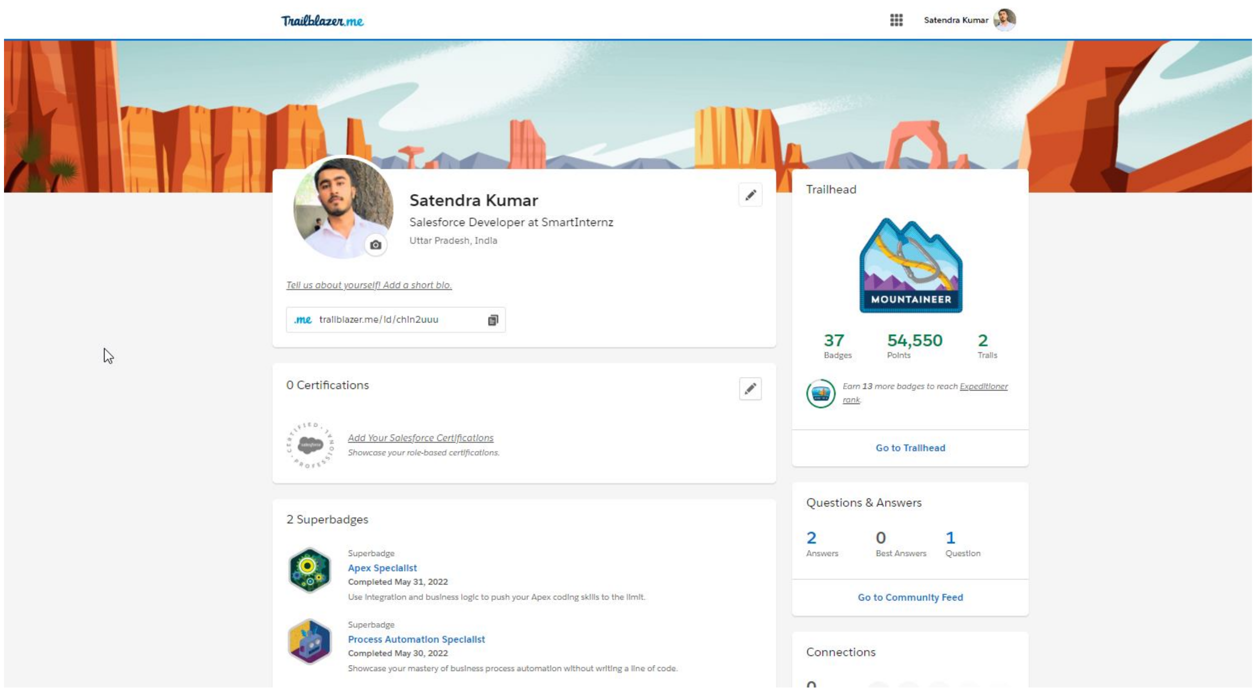
## Process Automation Specialist - SuperBadge: ***100%***

1. Formulas And Validations
2. Salesforce Flow
3. Leads & Opportunities For Lightning Experience

## Apex Codes & Link:-

https://github.com/smartinternz02/SPSGP-16662-Salesforce-Developer-Catalyst-Self-Learning-Super-Badges

## **Screenshots:**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Satendra Kumar

Satendra Kumar

Salesforce Developer at SmartInternz

Uttar Pradesh, India

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