Salesforce Developer Catalyst SelfLearning & Super Badges

Salesforce Developer-Self Learning

1) Salesforce Fundamentals & User Setup
2) Relationships & ProcessAutomation
3) Flows & Security
4) Apex,Testing And Debugging
5) Integration

Apex Specialist - Superbadge

1) Apex Triggers

```
trigger AccountAddressTrigger on Account (before insert, before update) {
    for(Account a: Trigger.New){
        if(a.Match_Billing_Address__c == true && a.BillingPostalCode!= null){
            a.ShippingPostalCode=a.BillingPostalCode;
        }
    }

}
```

2) Apex Testing

```
@isTest
private class TestVerifyDate {
   //testing that if date2 is within 30 days of date1, should return date 2
   @isTest static void testDate2within30daysofDate1() {
      Date date1 = date.newInstance(2018, 03, 20);
      Date date2 = date.newInstance(2018, 04, 11);
      Date resultDate = VerifyDate.CheckDates(date1,date2);
      Date testDate = Date.newInstance(2018, 04, 11);
      System.assertEquals(testDate,resultDate);
   }
   //testing that date2 is before date1. Should return "false"
   @isTest static void testDate2beforeDate1() {
      Date date1 = date.newInstance(2018, 03, 20);
      Date date2 = date.newInstance(2018, 02, 11);
      Date resultDate = VerifyDate.CheckDates(date1,date2);
      Date testDate = Date.newInstance(2018, 02, 11);
      System.assertNotEquals(testDate, resultDate);
   }
   //Test date2 is outside 30 days of date1. Should return end of month.
   @isTest static void testDate2outside30daysofDate1() {
      Date date1 = date.newInstance(2018, 03, 20);
      Date date2 = date.newInstance(2018, 04, 25);
      Date resultDate = VerifyDate.CheckDates(date1,date2);
      Date testDate = Date.newInstance(2018, 03, 31);
      System.assertEquals(testDate,resultDate);
   }

   }
```

3) Asynchronous Apex

```
public class AccountProcessor {

   @future
   public static void countContacts(List<Id> accountId_lst) {

      Map<Id,Integer> account_cno = new Map<Id,Integer>();
      List<account> account_lst_all = new List<account>([select id, (select id
from contacts) from account]);
      for(account a:account_lst_all) {
         account_cno.put(a.id,a.contacts.size()); //populate the map

      }

      List<account> account_lst = new List<account>(); // list of account that
we will upsert
      for(Id accountId : accountId_lst) {
         if(account_cno.containsKey(accountId)) {
            account acc = new account();
            acc.Id = accountId;
            acc.Number_of_Contacts__c = account_cno.get(accountId);
            account_lst.add(acc);
         }

      }
      upsert account_lst;
   }

}
```

4) Apex Integration Services

```
public class AnimalLocator {
        public class cls_animal {
                public Integer id;
                public String name;
                public String eats;
                public String says;
        }
public class JSONOutput{
        public cls_animal animal;

        //public JSONOutput parse(String json){
        //return (JSONOutput) System.JSON.deserialize(json,
JSONOutput.class);
        //}
}

   public static String getAnimalNameById (Integer id) {
      Http http = new Http();
      HttpRequest request = new HttpRequest();
      request.setEndpoint('https://th-apex-http-
callout.herokuapp.com/animals/' + id);
      //request.setHeader('id', String.valueof(id)); -- cannot be used in this
challenge :)
      request.setMethod('GET');
      HttpResponse response = http.send(request);
      system.debug('response: ' + response.getBody());
      //Map<String,Object> map_results = (Map<String,Object>)
JSON.deserializeUntyped(response.getBody());
      jsonOutput results = (jsonOutput)
JSON.deserialize(response.getBody(), jsonOutput.class);
```

```
        //Object results = (Object) map_results.get('animal');
                system.debug('results= ' + results.animal.name);
        return(results.animal.name);
    }

}
```

Skills Learnt During Completion Of The Superbadge

How to Automate record creation using Apex triggers

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));
                } 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> 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;
    }
  }
}
```

MaitenanceRequest.apxt

```
 trigger MaintenanceRequest on Case (before update, after update) {

   if(Trigger.isUpdate && Trigger.isAfter){

      MaintenanceRequestHelper.updateWorkOrders(Trigger.New,
Trigger.OldMap);

   }

}
```

Synchronize Salesforce data with an external system using asynchronous REST callouts

WarehouseCalloutService.apxc :-

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

   //class that makes a REST callout to an external warehouse system to
get a list of equipment that needs to be updated.
   //The callout's JSON response returns the equipment records that you
upsert in Salesforce.

   @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());
```

```
        //class maps the following fields: replacement part (always true),
cost, current inventory, lifespan, maintenance cycle, and warehouse SKU
        //warehouse SKU will be external ID for identifying which
equipment records to update within Salesforce
        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 = (Integer) mapJson.get('cost');
            myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
            myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
            myEq.ProductCode = (String) mapJson.get('_id');
            warehouseEq.add(myEq);
        }
        if (warehouseEq.size() > 0){
            upsert warehouseEq;
            System.debug('Your equipment was synced with the warehouse
one');
        }
    }
  }
  public static void execute (QueueableContext context){
    runWarehouseEquipmentSync();
  }

}
```

Schedule synchronization using Apex code

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

Test automation logic to confirm Apex trigger side effects

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;
    }
  }
}
```

MaintenanceRequest.apxt :-

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

Test integration logic using callout mocks

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]);
    }
}
```

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":fa
lse,"quantity":5,"name":"Generator 1000
kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"}]');
        response.setStatusCode(200);
        return response;
    }
}
```

Test scheduling logic to confirm action gets queued

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 ');


    }
}
```

Process Automation Specialist - SuperBadge

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

Skills Learnt During Completion Of Super badge

● Automate lead ownership using assignment rules
● Enforce data integrity with formula fields and validation rules
● Create a custom object in a master-detail relationship to a standard object
● Define an opportunity sales process using stages, record types, and validation rules
● Automate business processes to send emails, create related records, and submit opportunities for approval
● Create a flow to display dynamic information on a Lightning record page
● Create a process to evaluate and update record