Apex Specialist Superbadge

Step 2- Automate Record Creation

Code:

```
MaintenanceRequest.apxt
trigger MaintenanceRequest on Case (before update, after update) {
  if(Trigger.isUpdate && Trigger.isAfter){
    MaintenanceRequestHelper.updateWorkOrders(Trigger.New, Trigger.OldMap);
 }
}
MaintenanceRequestHelper.cls
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);
        }
      }
    //When an existing maintenance request of type Repair or Routine Maintenance is
closed.
    //create a new maintenance request for a future routine checkup.
    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>();
      //calculate the maintenance request due dates by using the maintenance cycle
defined on the related equipment records.
      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 multiple pieces of equipment are used in the maintenance request,
        //define the due date by applying the shortest maintenance cycle to today's
date.
        If (maintenanceCycles.containskey(cc.ld)){
          nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.ld));
        } 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.ld;
          clonedList.add(item);
      }
      insert clonedList;
 }
```

Step 3: Synchronize Salesforce data with an external system

Code:

WarehouseCalloutService.cls

```
public with sharing class WarehouseCalloutService implements Queueable {
  private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';
  //Write a 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(){
    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());
      //class maps the following fields:
      //warehouse SKU will be external ID for identifying which equipment records to
update within Salesforce
      for (Object jR : jsonResponse){
        Map<String,Object> mapJson = (Map<String,Object>)jR;
        Product2 product2 = new Product2();
        //replacement part (always true),
        product2.Replacement_Part__c = (Boolean) mapJson.get('replacement');
        //cost
        product2.Cost__c = (Integer) mapJson.get('cost');
        //current inventory
        product2.Current_Inventory__c = (Double) mapJson.get('quantity');
        //lifespan
        product2.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
        //maintenance cycle
        product2.Maintenance_Cycle__c = (Integer)
mapJson.get('maintenanceperiod');
        //warehouse SKU
        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');
}
```

Step 4: Schedule synchronization

Code:

WarehouseSyncSchedule.cls

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

Step 5: Test automation logic

Code:

```
MaintenanceRequest.cls
```

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

```
}
 MaintenanceRequestHelper.cls
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);
      }
    //When an existing maintenance request of type Repair or Routine Maintenance is
closed,
    //create a new maintenance request for a future routine checkup.
    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>();
      //calculate the maintenance request due dates by using the maintenance cycle
defined on the related equipment records.
      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 multiple pieces of equipment are used in the maintenance request,
        //define the due date by applying the shortest maintenance cycle to today's
date.
        //If (maintenanceCycles.containskey(cc.ld)){
          nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.ld));
        //} 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.ld;
          clonedList.add(item);
        }
      }
      insert clonedList;
 }
```

MaintenanceRequestHelperTest.cls

```
@isTest
public with sharing class MaintenanceRequestHelperTest {
  // createVehicle
  private static Vehicle__c createVehicle(){
    Vehicle_c vehicle = new Vehicle_C(name = 'Testing Vehicle');
    return vehicle;
  }
  // createEquipment
  private static Product2 createEquipment(){
    product2 equipment = new product2(name = 'Testing equipment',
                      lifespan_months__c = 10,
                      maintenance_cycle__c = 10,
                      replacement_part__c = true);
    return equipment;
  }
  // createMaintenanceRequest
  private static Case createMaintenanceRequest(id vehicleId, id equipmentId){
    case cse = new case(Type='Repair',
              Status='New',
               Origin='Web',
               Subject='Testing subject',
               Equipment_c=equipmentId,
              Vehicle_c=vehicleId);
    return cse;
  }
  // createEquipmentMaintenanceItem
  private static Equipment_Maintenance_Item__c createEquipmentMaintenanceItem(id
equipmentId,id requestId){
    Equipment_Maintenance_Item__c equipmentMaintenanceItem = new
Equipment_Maintenance_Item__c(
      Equipment_c = equipmentId,
      Maintenance_Request__c = requestId);
    return equipmentMaintenanceItem;
  }
```

```
@isTest
  private static void testPositive(){
    Vehicle_c vehicle = createVehicle();
    insert vehicle:
    id vehicleId = vehicle.Id;
    Product2 equipment = createEquipment();
    insert equipment;
    id equipmentId = equipment.Id;
    case createdCase = createMaintenanceRequest(vehicleId,equipmentId);
    insert createdCase:
    Equipment_Maintenance_Item__c equipmentMaintenanceItem =
createEquipmentMaintenanceItem(equipmentId,createdCase.id);
    insert equipmentMaintenanceItem;
    test.startTest();
    createdCase.status = 'Closed';
    update createdCase;
    test.stopTest();
    Case newCase = [Select id,
            subject,
            type,
            Equipment_c,
            Date_Reported__c,
            Vehicle__c.
            Date Due c
            from case
            where status ='New'];
    Equipment_Maintenance_Item__c workPart = [select id
                          from Equipment_Maintenance_Item__c
                          where Maintenance_Request__c =:newCase.Id];
    list<case> allCase = [select id from case];
    system.assert(allCase.size() == 2);
    system.assert(newCase != null);
    system.assert(newCase.Subject != null);
    system.assertEquals(newCase.Type, 'Routine Maintenance');
    SYSTEM.assertEquals(newCase.Equipment_c, equipmentId);
    SYSTEM.assertEquals(newCase.Vehicle_c, vehicleId);
    SYSTEM.assertEquals(newCase.Date_Reported__c, system.today());
```

```
}
  @isTest
  private static void testNegative(){
    Vehicle__C vehicle = createVehicle();
    insert vehicle;
    id vehicleId = vehicle.Id;
    product2 equipment = createEquipment();
    insert equipment;
    id equipmentId = equipment.Id;
    case createdCase = createMaintenanceRequest(vehicleId,equipmentId);
    insert createdCase;
    Equipment_Maintenance_Item__c workP =
createEquipmentMaintenanceItem(equipmentId, createdCase.Id);
    insert workP;
    test.startTest();
    createdCase.Status = 'Working';
    update createdCase;
    test.stopTest();
    list<case> allCase = [select id from case];
    Equipment_Maintenance_Item__c equipmentMaintenanceItem = [select id
                           from Equipment_Maintenance_Item__c
                           where Maintenance_Request__c = :createdCase.Id];
    system.assert(equipmentMaintenanceItem != null);
    system.assert(allCase.size() == 1);
  }
  @isTest
  private static void testBulk(){
    list<Vehicle_C> vehicleList = new list<Vehicle_C>();
    list<Product2> equipmentList = new list<Product2>();
    list<Equipment_Maintenance_Item__c> equipmentMaintenanceItemList = new
list<Equipment_Maintenance_Item__c>();
    list<case> caseList = new list<case>();
    list<id> oldCaseIds = new list<id>();
    for(integer i = 0; i < 300; i++){
      vehicleList.add(createVehicle());
      equipmentList.add(createEquipment());
    }
```

```
insert vehicleList;
    insert equipmentList;
    for(integer i = 0; i < 300; i++){
      caseList.add(createMaintenanceRequest(vehicleList.get(i).id,
equipmentList.get(i).id));
    insert caseList;
    for(integer i = 0; i < 300; i++){
equipmentMaintenanceItemList.add(createEquipmentMaintenanceItem(equipmentList.
get(i).id, caseList.get(i).id));
    insert equipmentMaintenanceItemList;
    test.startTest();
    for(case cs : caseList){
      cs.Status = 'Closed';
      oldCaseIds.add(cs.Id);
    update caseList;
    test.stopTest();
    list<case> newCase = [select id
                  from case
                  where status ='New'];
    list<Equipment_Maintenance_Item__c> workParts = [select id
                               from Equipment_Maintenance_Item__c
                               where Maintenance_Request__c in: oldCaseIds];
    system.assert(newCase.size() == 300);
    list<case> allCase = [select id from case];
    system.assert(allCase.size() == 600);
}
```

Step 6: Test callout logic

Code:

WarehouseCalloutService.cls

```
public with sharing class WarehouseCalloutService implements Queueable {
  private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';
  //Write a 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(){
    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());
      //class maps the following fields:
      //warehouse SKU will be external ID for identifying which equipment records to
update within Salesforce
      for (Object jR : jsonResponse){
        Map<String,Object> mapJson = (Map<String,Object>)jR;
        Product2 product2 = new Product2();
        //replacement part (always true),
        product2.Replacement_Part__c = (Boolean) mapJson.get('replacement');
        //cost
        product2.Cost__c = (Integer) mapJson.get('cost');
        //current inventory
        product2.Current_Inventory__c = (Double) mapJson.get('quantity');
        //lifespan
        product2.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
```

```
//maintenance cycle
        product2.Maintenance_Cycle__c = (Integer)
mapJson.get('maintenanceperiod');
        //warehouse SKU
        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');
 }
}
 WarehouseCalloutServiceMock.cls
@isTest
global class WarehouseCalloutServiceMock implements HttpCalloutMock {
  // implement http mock callout
  global static HttpResponse respond(HttpRequest request) {
    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"},{"_id":"55d66226
726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d66226726b6
11100aaf743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
```

```
response.setStatusCode(200);
    return response;
 }
}
 WarehouseCalloutServiceTest.cls
@IsTest
private class WarehouseCalloutServiceTest {
  // implement your mock callout test here
      @isTest
  static void testWarehouseCallout() {
    test.startTest();
    test.setMock(HttpCalloutMock.class, new WarehouseCalloutServiceMock());
    WarehouseCalloutService.execute(null);
    test.stopTest();
    List<Product2> product2List = new List<Product2>();
    product2List = [SELECT ProductCode FROM Product2];
    System.assertEquals(3, product2List.size());
    System.assertEquals('55d66226726b611100aaf741',
product2List.get(0).ProductCode);
    System.assertEquals('55d66226726b611100aaf742',
product2List.get(1).ProductCode);
    System.assertEquals('55d66226726b611100aaf743',
product2List.get(2).ProductCode);
}
```

Step 7: Test scheduling logic

Code:

WarehouseCalloutServiceMock.cls

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

```
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"},{"_id":"55d66226
726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d66226726b6
11100aaf743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
    response.setStatusCode(200);
    return response;
 }
}
 WarehouseSyncSchedule.cls
global with sharing class WarehouseSyncSchedule implements Schedulable {
  // implement scheduled code here
  global void execute (SchedulableContext ctx){
    System.enqueueJob(new WarehouseCalloutService());
 }
}
 WarehouseSyncScheduleTest.cls
@isTest
public with sharing class WarehouseSyncScheduleTest {
  // implement scheduled code here
  //
  @isTest static void test() {
    String scheduleTime = '00 00 00 * *? *';
    Test.startTest();
    Test.setMock(HttpCalloutMock.class, new WarehouseCalloutServiceMock());
    String jobId = System.schedule('Warehouse Time to Schedule to test',
scheduleTime, new WarehouseSyncSchedule());
    CronTrigger c = [SELECT State FROM CronTrigger WHERE Id =: jobId];
```

```
System.assertEquals('WAITING', String.valueOf(c.State), 'JobId does not match');
    Test.stopTest();
}
```

Process Automation Specialist

Step 2: Automate Leads

Formula Used:

OR(

NOT(CONTAINS("AL:AK:AZ:AR:CA:CO:CT:DE:DC:FL:GA:HI:ID:IL:IN:IA:KS:KY:LA:ME:MD:MA:MI:MN:MS:MO:MT:NE:NV:NH:NJ:NM:NY:NC:ND:OH:OK:OR:PA:RI:SC:SD:TN:TX:UT:VT:VA:WA:WV:WI:WY", State)),

```
LEN(State) <> 2,

NOT(OR(Country ="US",Country ="USA",Country ="United States", ISBLANK(Country)))
)
```

Step 3: Automate Accounts

Formula used:

ValidationForBilling

OR(

NOT(CONTAINS("AL:AK:AZ:AR:CA:CO:CT:DE:DC:FL:GA:HI:ID:IL:IN:IA:KS:KY:LA:ME:MD:MA:MI:M N:MS:MO:MT:NE:NV:NH:NJ:NM:NY:NC:ND:OH:OK:OR:PA:RI:SC:SD:TN:TX:UT:VT:VA:WA:WV:WI: WY", BillingState)), LEN(BillingState) <> 2, NOT(OR(BillingCountry = "US",BillingCountry = "US",ShippingState)), LEN(ShippingState) <> 2, NOT(OR(ShippingCountry = "US",ShippingCountry = "US",ShippingCountry = "US",ShippingCountry = "US",ShippingCountry = "US",ShippingCountry = "US",ShippingCountry = "UNITED STATES", ISBLANK(ShippingCountry))))

ValidationForType

ISCHANGED(Name) && (OR(ISPICKVAL(Type, 'Customer - Direct'), ISPICKVAL(Type, 'Customer - Channel')))

Step 4: Create Robot Setup Object

Formula Used:

Day of the week:-

CASE(weekday(Date_c), 1,"Sunday", 2,"Monday", 3,"Tuesday", 4,"Wednesday", 5,"Thusday", 6,"Friday", 7,"Saturday", Text(weekday(Date_c)))

Step 5: Create Sale Process and Validate Oppurtunities

Create Sales Process and Validate Opportunities

Create a sales process with the required stages and name it RB Robotics Sales Process. Create a record type named RB Robotics Process RT. Add a field to the opportunity page layout as described in the business requirements and create the appropriate validation rule for high-value opportunities.

Formula Used:

ValidationForHighValue

Validation: AND(ISPICKVAL(StageName , "Closed Won") , Amount>100000, Approved_c =FALSE)

Step 6: Automate Oppurtunities

Following the business requirements, create a process to alert the finance group and create tasks for account owners at appropriate times during the sales process. (Note: for the purpose of this superbadge, pretend "Integration User" is the finance group.) Make sure that your processes schedule robot setup dates and submit opportunities for approval.

For the purpose of approvals, assign Nushi Davoud as your manager and make sure your approval process automatically sends requests to the opportunity owner's manager. Notify the opportunity owner when an opportunity is approved or rejected.

Use the Finance: Account Creation, SALES: Opportunity Needs Approval, and Sales: Opportunity Approval Status Email templates included in the unmanaged package for your processes.

Step 7: Create Flow for Opportunities

Create Flow for Opportunities

Create a flow and distribute that flow with a Flow component in the Lightning page described in the business requirements. Name the flow Product Quick Search.

Note: If your org doesn't have products with RainbowBot, CloudyBot, and Assembly System in the product name, check that you created a new Trailhead Playground for this superbadge, per the prework requirements.

Step 8: Automate Setups

Automate Setups We need to make sure that any robot setup date that would fall on Saturday or Sunday is set to the following Monday instead.

Formula Used:

CASE(MOD([Opportunity].CloseDate + 180 - DATE(1900, 1, 7),7), 0, [Opportunity].CloseDate + 181, 6, [Opportunity].CloseDate + 182, [Opportunity].CloseDate + 180)