Super-Badge: Apex Specialist

Because of increasing demand in recreational vehicle,the following subpart of project aims to enhance the reach of HowWeRoll (world's largest RV rental company) to fullfill the traveler's demand.HowWeRoll needs you to automate their Salesforce-based routine maintenance system and also integrate Salesforce with HowWeRoll's back-office system that keeps track of warehouse inventory

Automate record creation

```
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

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

WarehouseSyncShedule.apxc:

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

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;
      }
   }
}
```

MaintenanceRequest.apxt :-

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

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]);
    }
}
```

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;
    }
}
```

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 ');


    }
```

}

2.SuperBadge : Process Automation Specialist

Automate Leads
Step-1 :
Validation rule on Lead to verify Country and State field. Lead Country must be either US, USA or United State or it can be blank. Lead State must be valid 2-digit US state.
Steps-2 :
Create Two Queues
1. Rainbow Sales.
2. Assembly System Sales.
Create an lead assignment rule and make 2 rules entries and give order accordingly.Based on LeadSource value lead should be assign to correct sales team (Queue).

```
If(LeadSource == 'Web'){
        Assign lead to Rainbow Sales Queue;
  }
  else if(LeadSource == 'Partner' || LeadSource == 'Purchased List'){
        Assign lead to Assembly System Sales Queue.
  }
```

Automate Accounts

Step-1

Validation rule on ShippingCountry and BillingCountry i.e. Shipping and Billing Country must be either US, USA, United State or it can be blank.

```
NOT (OR ( BillingCountry = 'US', BillingCountry = 'USA', BillingCountry = 'United State',
ISBLANK (BillingCountry ),
     ShippingCountry = 'US', ShippingCountry = 'USA', ShippingCountry = 'United
State',      ISBLANK(ShippingCountry) )
)
```

Step-2

Validation rule on ShippingState and BillingState i.e. ShippingState and BillingSTate must be a valid 2-digit US state.

```
OR( AND(
                LEN ( ShippingState ) > 2 ,
                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", ShippingState))),

                AND(LEN ( BillingState ) > 2 ,
                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", BillingState)
    )   )
```

Validation Rule on Name and Type Field i.e. Restrict user to change Account Name if Account Type picklist field value is either Customer - Direct or Customer - Channel.

```
IF(AND
   (OR( ISPICKVAL(Type, 'Customer - Direct'), ISPICKVAL(Type, 'Customer - Channel')),
   NOT(ISNEW())
   ), ISCHANGED(Name), null
)
```

Create some Roll-up Summary and formula field on Account Object.
Note:- Roll-up summary fields can created on master side of master-detail relationship.

Number of deals This field display number of all deals(Opportunities) under an account. Count(Opportunities).

Number of won deals This field display number of opportunities with stage as Closed Won under an account.Count(Opportunities) with criteria as StageName equals to 'Closed Won'.

Last won deal date This field display date of last won opportunity MAX(ClosedDate) with criteria as StageName = 'Closed Won'.

Deal win percent Formula Field (Number of won deals / Number of deals)

Amount of won deals This field display sum of all won opportunities. SUM (Amount) with criteria as StageName = 'Closed Won'.

Call for Service Formula (Text) display Yes/No based on formula.
Return 'Yes', if last won date is 2 year ago otherwise 'No'.
IF((TODAY() - Last_won_deal_date__c) / 365 <=2 , 'No', 'Yes')

Create Robot Setup Object

This challenge is all about setting-up Robot Setup Object and create some fields on it.

Name :- ROBOT SETUP-{0000} Starts with 0
Date :- Date type field
Notes :- TextArea (255)

Day of the Week :- Formula (Text)
Opportunity :- Master-Detail Relationship with Opportunity.

Sales Process and Validate Opportunities

Steps-1

Configure Stage Picklist field :-

Prospecting
Qualification
Proposal/Price Quote
Negotiation/Review
Awaiting Approval
Closed Won
Closed Lost

Step-2

Validation rule on Amount and Approved__c i.e. prevent opportunity record being saved if amount is greater than $10,00,00 and approved is set to false.

AND(Amount > 100000, ISPICKVAL(StageName, 'Closed Won'), Approved__c = false)

Step-3

New record type RB Robotics Process RT
New Sales Process RB Robotics Sales Process

Whenever an opportunity is created for Prospect type account

Send Email alert to Finance Group. (Integration User)
Create a Task for Account Owner.

Whenever an Opportunity is created for Customer type account

Send an Email alert to Finance Group. (Integration User)

Create an approval process with entry criteria as followed :-

Opportunity.Amount > 100000
Email Template :- SALES: Opportunity Needs Approval
Create Initial Submission Actions (Field Update) => Set Opportunity Stage to Waiting Approval.
Create Final Approval Actions (Field Update) => Set Opportunity Stage to Closed Won

Whenever Opportunity is in Negotiation/Review Stage
Submit opportunity for Approval

When deal is won i.e Opportunity stage is Closed Won

Create Robot Setup Record
Email Alert to Finance Group

Create Flow for Opportunities

In this part of challenge, we gonna create a flow which takes some input from user and will return list of Product record.

Create a User-Guided Lightning Flow.

Create three Choice type Resources and use them into Flow Screen
Choice Value:-

RainbowBot
CloudyBot
Assembly System

Use Get Record data element to get all products where name contains the options which you have selected from flow screen.

Automate Setups

In this part of challenge we need to setup Robot Setup Date

If Robot Setup Date / Day Of Week is either on Saturday or Sunday, then make it to Monday.

Robot Setup Date +2, for Saturday
Robot Setup Date +1, for Sunday