TITLE: Salesforce Developer Catalyst Self-Learning & Super Badges

APEX TRIGGERS:

1. AccountAdressTrigger

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

    for(Account account:Trigger.New){
        if(account.Match_Billing_Address__c == True){
            account.ShippingPostalCode = account.BillingPostalCode;
        }
    }
}
```

2. ClosedOpportunityTrigger

```
trigger ClosedOpportunityTrigger on Opportunity (after insert, after update) {
    List<Task> tasklist = new List<Task>();

    for(Opportunity opp: Trigger.New){
        if(opp.StageName == 'Closed Won'){
            tasklist.add(new Task(Subject = 'Follow Up Test Task', WhatId = opp.Id));
        }
    }
    if(tasklist.size()>0){
        insert tasklist;
    }
}
```

3. RestrictContactByName

```
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');
    }
  }
}
```

APEX TESTING:

1. VerifyDate

```
public class VerifyDate {

  public static Date CheckDates(Date date1, Date date2) {
    //if date2 is within the next 30 days of date1, use date2.  Otherwise use the end of the month
    if(DateWithin30Days(date1,date2)) {
      return date2;
    } else {
      return SetEndOfMonthDate(date1);
    }
  }

  //method to check if date2 is within the next 30 days of date1
  @TestVisible private static Boolean DateWithin30Days(Date date1, Date date2) {
    //check for date2 being in the past
          if( date2 < date1) { return false; }

          //check that date2 is within (>=) 30 days of date1
          Date date30Days = date1.addDays(30); //create a date 30 days away from date1
    if( date2 >= date30Days ) { return false; }
    else { return true; }
  }

  //method to return the end of the month of a given date
  @TestVisible private static Date SetEndOfMonthDate(Date date1) {
    Integer totalDays = Date.daysInMonth(date1.year(), date1.month());
    Date lastDay = Date.newInstance(date1.year(), date1.month(), totalDays);
    return lastDay;
  }
```

}

2. TestVerifyDate

```
@isTest
public class TestVerifyDate {
    @isTest static void Test_CheckDatess_case1(){
        Date D =
VerifyDate.CheckDates(date.parse('01/01/2020'),date.parse('01/05/2020'));
        System.assertEquals(date.parse('01/05/2020'), D);
    }

    @isTest static void Test_CheckDatess_case2(){
        Date D =
VerifyDate.CheckDates(date.parse('01/01/2020'),date.parse('05/05/2020'));
        System.assertEquals(date.parse('01/31/2020'), D);
    }

    @isTest static void Test_DateWithin30Days_case1(){
        Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'),
date.parse('12/30/2019'));
        System.assertEquals(false, flag);

    }

    @isTest static void Test_DateWithin30Days_case2(){
        Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'),
date.parse('02/02/2019'));
        System.assertEquals(false, flag);

    }

    @isTest static void Test_DateWithin30Days_case3(){
        Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'),
date.parse('01/15/2020'));
```

```
        System.assertEquals(true, flag);

    }

    @isTest static void Test_SetEndOfMonthDate(){
        Date returndate = VerifyDate.SetEndOfMonthDate(date.parse('01/01/2020'));
    }
}
```

3. TestRestrictContactByName

```
@isTest
public class TestRestrictContactByName {

    @isTest static void Test_insetupdateContact(){
        Contact cnt = new Contact();
        cnt.LastName = 'INVALIDNAME';

        Test.startTest();
        Database.SaveResult result = Database.insert(cnt, false);
        Test.stopTest();

        System.assert(!result.isSuccess());
        System.assert(result.getErrors().size()>0);
        System.assertEquals('The Last Name "INVALIDNAME" is not allowed for DML',
result.getErrors()[0].getMessage());
    }
}
```

4. RandomContactFactory

```
public class RandomContactFactory {

    public static List<Contact> generateRandomContacts(Integer numcnt, string
lastname){
        List<Contact> contacts = new List<Contact>();
```

```
        for(Integer i = 0; i<numcnt;i++){
            Contact cnt = new Contact(FirstName = 'Test' +i, LastName = lastname);
            contacts.add(cnt);
        }
        return contacts;

    }
}
```

ASYNCHRONOUS APEX:

1. AccountProcessor

```
public class AccountProcessor {
    @future
    public static void countContacts(List<Id> accountIds){
        List<Account> accountsToUpdate  = new List<Account>();
        List<Account> accounts = [Select Id, Name,(Select Id from Contacts) from Account
where Id in:accountIds];
        for(Account acc: accounts){
            List<Contact> contactList = acc.Contacts;
            acc.Number_Of_Contacts__c = contactList.size();
            accountsToUpdate.add(acc);

        }
        update accountsToUpdate;
    }
}
```

2. AccountProcessorTest

```
@IsTest
private class AccountProcessorTest {
    @IsTest
    private static void testCountContacts(){
        Account newAccount = new Account(Name='Test Account');
```

```
        insert newAccount;

     Contact newContact1 = new Contact(FirstName = 'John', LastName = 'Doe',
AccountId = newAccount.Id);
        insert newContact1;

        Contact newContact2 = new Contact(FirstName = 'Jane', LastName = 'Doe',
AccountId = newAccount.Id);
        insert newContact2;

        List<Id> accountIds = new List<Id>();
        accountIds.add(newAccount.Id);
        Test.startTest();
        AccountProcessor.countContacts(accountIds);
        Test.stopTest();
    }

}
```

3. LeadProcessor

```
global class LeadProcessor implements Database.Batchable<sObject> {
    global Integer count = 0 ;
    global Database.QueryLocator start(Database.BatchableContext bc){
        return Database.getQueryLocator('SELECT ID ,LeadSource FROM Lead');
    }

    global void execute (Database.BatchableContext bc, List<Lead> L_List){
        List<lead> L_list_new = new List<lead>();

        for(lead L:L_list){
            L.leadsource = 'Dreamforce';
            L_list_new.add(L);
            count += 1;
        }
        update L_list_new;
    }
```

```
    global void finish(Database.BatchableContext bc){
        system.debug('count = ' + count);
    }
}
```

4. LeadProcessorTest

```
@isTest
public class LeadProcessorTest {

    @isTest
    public static void testit(){
        List<lead> L_list = new List<lead>();

        for(Integer i=0;i<200; i++){
            Lead L = new lead();
            L.LastName = 'name' + i;
            L.Company = 'Company';
            L.Status = 'Random Status';
            L_list.add(L);
        }
        insert L_list;

        Test.startTest();
        LeadProcessor lp = new LeadProcessor();
        Id batchId = Database.executeBatch(lp);
        Test.stopTest();
    }
}
```

5. AddPrimaryContact

```
public class AddPrimaryContact implements Queueable {

    private Contact con;
    private String state;
```

```
    public AddPrimaryContact(Contact con, String state){
        this.con = con;
        this.state = state;

    }

    public void execute(QueueableContext context){
        List<Account> accounts = [Select Id, Name,(Select FirstName,LastName,Id from
contacts)
                                  from Account where BillingState = :state Limit 200];
        List<Contact> primaryContacts = new List<Contact>();

        for(Account acc:accounts){
            contact c = con.clone();
            c.AccountId = acc.Id;
            primaryContacts.add(c);
        }

        if(primaryContacts.size() > 0){
            insert primaryContacts;

        }
    }

}
```

6. AddPrimaryContactTest

```
@isTest
public class AddPrimaryContactTest {

    static testmethod void testQueueable(){
        List<Account> testAccounts = new List<Account>();
        for(Integer i=0;i<50;i++){
            testAccounts.add(new Account(Name = 'Account' +i,BillingState = 'CA'));
        }
```

```
        for(Integer j=0;j<50;j++){
            testAccounts.add(new Account(Name = 'Account' +j,BillingState = 'CA'));
        }
        insert testAccounts;
        Contact testContact = new Contact(FirstName = 'Jhon',LastName='Doe');
        insert testContact;

        AddPrimaryContact addit = new addPrimaryContact(testContact,'CA');

        Test.startTest();
        system.enqueueJob(addit);
        Test.stopTest();

        system.assertEquals(50, [Select count() from Contact where accountId in (Select
Id from Account where BillingState = 'CA')]);

    }
}
```

7. DailyLeadProcessor

```
public without sharing class DailyLeadProcessor implements  Schedulable{
    public void execute(SchedulableContext ctx){

        List<Lead> leads = [SELECT Id, LeadSource FROM Lead WHERE LeadSource = null LIMIT 200];

        for(Lead l:leads){
            l.LeadSource = 'Dreamforce';
        }
        update leads;
    }


}
```

8. DailyLeadProcessorTest

```
private class DailyLeadProcessorTest {
    public static String CRON_EXP = '0 0 0 ? * * *';
    @isTest
    private static void testSchedulableClass(){
        List<Lead> leads = new List<Lead>();
```

```
        for(Integer i=0; i<500; i++){
            if(i<250){
                leads.add(new Lead(LastName='Connock',Company='Salesforce'));
            }else{
                leads.add(new
Lead(LastName='Connock',Company='Salesforce',LeadSource='Other'));
            }
        }
        insert leads;

        Test.startTest();
        String jobId = System.schedule('Process Leads',CRON_EXP, new
DailyLeadProcessor());
        Test.stopTest();

        List<Lead> updatedLeads =[SELECT Id, LeadSource FROM Lead WHERE
LeadSource = 'Dreamforce'];
        System.assertEquals(200,updatedLeads.size(),'ERROR: At least 1 record not
updated correctly');

        List<CronTrigger> cts = [SELECT Id, TimesTriggered, NextFireTime FROM
CronTrigger WHERE Id = :jobId];
        System.debug('Next Fire Time'+cts[0].NextFireTime);

    }

}
```

APEX INTEGRATION SERVICES:

1. AnimalLocator

```
public class AnimalLocator {
    public static String getAnimalNameById(Integer animalId) {
        String animalName;
        Http http = new Http();
```

```
        HttpRequest request = new HttpRequest();
        request.setEndpoint('https://th-apex-http-
callout.herokuapp.com/animals/'+animalId);
      request.setMethod('GET');
        HttpResponse response = http.send(request);
        // If the request is successful, parse the JSON response.
        if(response.getStatusCode() == 200) {
            Map<String, Object> r = (Map<String, Object>)
                JSON.deserializeUntyped(response.getBody());
            Map<String, Object> animal = (Map<String, Object>)r.get('animal');
           animalName = String.valueOf(animal.get('name'));
            }
        return animalName;
    }
}
```

2. AnimalLocatorTest

```
@isTest
private class AnimalLocatorTest {
    @isTest static void getAnimalNameByIdTest(){
        Test.setMock(HttpCalloutMock.class, new AnimalLocatorMock());
        string response = AnimalLocator.getAnimalNameById(1);

        System.assertEquals('chicken', response);
    }
}
```

3. AnimalLocatorMock

```
@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('{"animal":{"id":1,"name":"chicken","eats":"checken
food","says":"cluck cluck"}}');
        response.setStatusCode(200);
        return response;
    }
}
```

4. ParkLocator

```
public class ParkLocator {
    public static List<String> country(String country) {
        ParkService.ParksImplPort parkservice =
            new parkService.ParksImplPort();
        return parkService.byCountry(country);
    }
}
```

5. ParkLocatorTest

```
@isTest
private class ParkLocatorTest{
    @isTest static void testCallout() {
        Test.setMock(WebServiceMock.class, new ParkServiceMock());
        String country = 'United States';
        List<String> result = ParkLocator.country(country);
        List<String> parks = new List<String>();
        parks.add('Yosemite');
        parks.add('Yellowstone');
        parks.add('Another Park');
        System.assertEquals(parks, result);
    }
}
```

6. ParkServiceMock

```
@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
       List<String> parks = new List<String>();
              parks.add('Yosemite');
              parks.add('Yellowstone');
              parks.add('Another Park');

       ParkService.byCountryResponse response_x =
           new ParkService.byCountryResponse();
       response_x.return_x = parks;
       // end
       response.put('response_x', response_x);
   }
}
```

7. AccountManager

```
@RestResource(urlMapping='/Account/*/contacts')
global with sharing class AccountManager {
    @HttpGet
    global static Account getAccount() {
       RestRequest request = RestContext.request;
       String accountId = request.requestURI.substringBetween('Accounts/','/contacts');
       Account result = [SELECT Id, Name, (select Id, Name from Contacts) from
Account where Id =:accountId];
       return result;
```

```
    }
}
```

8. AccountManagerTest

```
 @IsTest
 private class AccountManagerTest {
    @isTest static void testGetContactsByAccountId() {
    Id recordId = createtestRecord();
    RestRequest request = new RestRequest();
    request.requestUri =
'https://yourInstance.my.salesforce.com/services/apexrest/Accounts/'+recordId+'/contacts';
    request.httpMethod = 'GET';
    RestContext.request = request;
     Account thisAccount = AccountManager.getAccount();
    System.assert(thisAccount != null);
    System.assertEquals('Test record', thisAccount.Name);
  }
 static Id createTestRecord() {
    Account accountTest = new Account(
    Name = 'Test record');
    insert accountTest;

    Contact contactTest = new Contact(
    FirstName = 'John',
    LastName = 'Doe',
    AccountId = accountTest.Id
  );
    insert contactTest;
    return accountTest.Id;
 }
 }
```

Apex Specialist -SuperBadge:

Challenge 1- Automated Record Creation

a) MaintenanceRequest

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

b) MaintenanceRequestHelper

```
 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()
          );
          //nc.Date_Due__c=Date.today().addDays((Integer)
maintenanceCyles.get(cc.Id));

          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;
    }
  }
}
```

Challenge 2 : Synchronize Salesforce data with an external System

a) WarehouseCalloutService

```
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');
    }

}
```

Challenge 3: Schedule Synchronization using Apex code

a) WarehouseSyncShedule

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

Challenge 4 : Test automation logic

a) MaintenanceRequestHelperTest

```
@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);
    }
}
```

b) MaintenanceRequestHelper

```
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()
           );
           //nc.Date_Due__c=Date.today().addDays((Integer)
maintenanceCyles.get(cc.Id));

           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;
    }
  }
}
```

c) MaintenanceRequest

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

Challenge 5: Test callout logic

a) WarehouseCalloutService

```
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');
    }

}
```

b) WarehouseCalloutServiceTest

```
@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);
    }
}
```

c) WarehouseCalloutServiceMock

@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":"55d662
26726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d6622672
6b611100aaf743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
        response.setStatusCode(200);

        return response;
    }
}
```

Challenge 6 : Test scheduling logic

a) WarehouseSyncSchedule

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

b) WarehouseSyncScheduleTest

```
@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();
    }
}
```

.....end.....