

## *\*Salesforce Developer Catalyst Self-Learning & Super Badges\**

### APEX TRIGGERS -->

#### 1. Get Started With Apex Triggers

///**AccountAddressTrigger**///

```
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. Bulk Apex Triggers

///**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;
    }
}

```

\*\*\*\*\*

## Apex Testing--->

### 1. Get Started with Apex Unit Tests

///VerifyDate///

```

public class VerifyDate {

    //method to handle potential checks against two dates
    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;
}
}

```

\*\*\*\*\*

### ///TestVerifyDate///

```

@Test
private class TestVerifyDate{

    @istest static void Test_CheckDates_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_CheckDates_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('02/02/2020'));
        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'));
    }

}

```

\*\*\*\*\*

## 2. Test Apex Triggers

*///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');
        }

    }

}

```

\*\*\*\*\*

///TestRestrictContactByName///

```
@istest
public class TestRestrictcontactByName {

    @isTest
    public static void testcontact(){
        Contact ct = new Contact();
        ct.LastName = 'INVALIDNAME';
        Database.SaveResult res = Database.insert(ct,false);
        System.assertEquals('The Last Name "INVALIDNAME" is not allowed for
DML', res.getErrors()[0].getMessage());
    }
}
```

\*\*\*\*\*

### 3. Create Test Data for Apex Tests

///RandomContactFactory///

```
public class RandomContactFactory {

    public static List <Contact> generateRandomContacts(Integer num, String lastName){
        List <Contact> contactList = new List<Contact>();
        for(Integer i = 1; i<=num; i++){
            Contact ct = new Contact(FirstName = 'Test '+i, LastName
=lastName);
            contactList.add(ct);
        }
        return contactList;
    }
}
```



\*\*\*\*\*

## Asynchronous Apex-->

### 1. Use Future Methods

```
///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;

    }
}
```

\*\*\*\*\*

```
///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();

}
}

```

\*\*\*\*\*

## 2. Use Batch Apex

```

///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);
    }
}

*****

///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();
    }
}

```

\*\*\*\*\*

### 3. Control Processes with Queueable Apex

**///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
                                                                    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;
        }
    }
}

```

```
}
```

```
*****
```

```
///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<5;j++){
```

```
            testAccounts.add(new Account (Name='Account '+j, BillingState='NY'));
```

```
        }
```

```
        insert testAccounts;
```

```
        Contact testContact=new Contact(FirstName='John', 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')]);
```

```
    }
```

```
}
```

```
*****
```

#### 4. Schedule Jobs Using the Apex Scheduler

```

///DailyLeadProcessor///
global class DailyLeadProcessor implements Schedulable{
    global void execute(SchedulableContext ctx){
        List<Lead> leads = [SELECT Id, LeadSource FROM Lead WHERE LeadSource = "];
        if(leads.size() > 0){
            List<Lead> newLeads = new List<Lead>();
            for(Lead lead : leads){
                lead.LeadSource = 'DreamForce';
                newLeads.add(lead);
            }
            update newLeads;
        }
    }
}

*****

```

```

///DailyLeadProcessorTest///
@isTest
private class DailyLeadProcessorTest{
    //Seconds Minutes Hours Day_of_month Month Day_of_week optional_year
    public static String CRON_EXP = '0 0 0 2 6 ? 2022';
    static testmethod void testScheduledJob(){
        List<Lead> leads = new List<Lead>();
        for(Integer i = 0; i < 200; i++){
            Lead lead = new Lead(LastName = 'Test ' + i, LeadSource = "", Company = 'Test
Company ' + i, Status = 'Open - Not Contacted');
            leads.add(lead);
        }
        insert leads;
        Test.startTest();
        // Schedule the test job
        String jobId = System.schedule('Update LeadSource to DreamForce', CRON_EXP,
new DailyLeadProcessor());
        // Stopping the test will run the job synchronously
        Test.stopTest();
    }
}

```

```
}
```

```
*****
```

## Apex Integration Services-->

### 2. Apex REST Callouts

```
///AnimalLocator///  
public class AnimalLocator{  
    public static String getAnimalNameById(Integer x){  
        Http http = new Http();  
        HttpRequest req = new HttpRequest();  
        req.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/' + x);  
        req.setMethod('GET');  
        Map<String, Object> animal= new Map<String, Object>();  
        HttpResponse res = http.send(req);  
        if (res.getStatusCode() == 200) {  
            Map<String, Object> results = (Map<String,  
Object>)JSON.deserializeUntyped(res.getBody());  
            animal = (Map<String, Object>) results.get('animal');  
        }  
        return (String)animal.get('name');  
    }  
}
```

```
*****
```

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

```

        System.assertEquals(result,expectedResult );
    }
}

```

\*\*\*\*\*

///[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('{ "animals": ["majestic badger", "fluffy bunny", "scary bear",
"chicken", "mighty moose"]}');
        response.setStatusCode(200);
        return response;
    }
}

```

\*\*\*\*\*

### 3. Apex SOAP Callouts

```

///ParkLocator///
public class ParkLocator {
    public static string[] country(string theCountry){
        ParkService.ParksImplPort parkSvc = new ParkService.ParksImplPort();
        return parkSvc.byCountry(theCountry);
    }
}

```

\*\*\*\*\*

///[ParkLocatorTest](#)///

```

@Test
private class ParkLocatorTest {
    @Test 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>{'Yellowstone', 'Mackinac National Park',
'Yosemite'};
        System.assertEquals(parks, result);
    }
}

```

\*\*\*\*\*

```

///ParkServiceMock///
@Test
global class ParkServiceMock implements WebServiceMock {
    global void doInvoke(
        Object stub,
        Object request,
        Map<String, Object> response,
        String endpoint,
        String soapAction,
        String requestName,
        String responseNS,
        String responseName,
        String responseType) {
        // start - specify the response you want to send
        ParkService.byCountryResponse response_x = new
ParkService.byCountryResponse();
        response_x.return_x = new List<String>{'Yellowstone', 'Mackinac National Park',
'Yosemite'};
        // end
        response.put('response_x', response_x);
    }
}

```

\*\*\*\*\*

## 4. Apex Web Services

///**AccountManager**///

@RestResource(urlMapping = '/Accounts/\*/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 Limit 1];

        return result;

    }

}

\*\*\*\*\*

///**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 SuperBadges--->

### Challenge 1-Automated Record Creation

///MaintenanceRequest///

```

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

```

\*\*\*\*\*

///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);  
        }  
    }  
}
```

```
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;
}
}
}

*****

```

## Challenge 2-Synchronize Salesforce data with an external system

///**WarehouseCalloutService**///

```

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);
    }

}

}

}

```

\*\*\*\*\*

### Challenge 3-Schedule synchronization using Apex code

```

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}

```

\*\*\*\*\*

### Challenge 4-Test automation logic

```

///MaintenanceRequestHelperTest///
@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**///

```
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///
```

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

```
*****
```

### Challenge 5-Test callout logic

```
///WarehouseCalloutService///
```

```
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///

@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///
@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;
    }
}

*****

```

## Challenge 6-Test scheduling logic

```

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}

```

```
}  
}
```

\*\*\*\*\*

**///WarehouseSyncScheduleTest///**

@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 ');

    }  
}

\*\*\*\*\*

**# COMPLETED ALL APEX RELATED MODULES #**