

APEX TRIGGERS

•GET STARTED WITH APEX TRIGGERS:

1.AccountAddressTrigger.apxt

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

•BULK APEX TRIGGERS:

1.ClosedOpportunityTrigger.apxt

```
trigger ClosedOpportunityTrigger on Opportunity (after insert, after update) {  
    List<Task> taskList = new List<Task>();  
    for(Opportunity opp : [SELECT Id, StageName FROM Opportunity WHERE  
StageName='Closed Won' AND Id IN : Trigger.New]){  
        taskList.add(new Task(Subject='Follow Up Test Task', WhatId = opp.Id));  
    }  
    if(taskList.size()>0){  
        insert tasklist;  
    } }  
}
```

APEX TESTING

•GET STARTED WITH APEX UNIT TEST:

1.VerifyDate.apxc

```
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);
        }
    }
    private static Boolean DateWithin30Days(Date date1, Date date2) {
        Date date30Days = date1.addDays(30); //create a date 30 days away from date1
        if( date2 > date30Days ) { return false; }
        else { return true; }
    }
    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.apxc

```
@isTest
private class TestVerifyDate {

    @isTest static void testCheckDates() {
        Date now = Date.today();
        Date lastOfTheMonth = Date.newInstance(now.year(), now.month(),
```

```

Date.daysInMonth(now.year(), now.month()));
    Date plus60 = Date.today().addDays(60);

    Date d1 = VerifyDate.CheckDates(now, now);
    System.assertEquals(now, d1);
Date d2 = VerifyDate.CheckDates(now, plus60);
    System.assertEquals(lastOfTheMonth, d2);
}
}

```

•TEST APEX TRIGGERS:

1.RestrictContactByName.apxt

```

trigger RestrictContactByName on Contact (before insert) {
    For (Contact c : Trigger.New) { if(c.LastName == 'INVALIDNAME') {
        //invalidname is invalid
        c.AddError('The Last Name "'+c.LastName+'" is not allowed for DML');
    }
}
}

```

•CREATE TEST DATA FOR APEX TESTS:

1.RandomContactFactory.apxc

```

public class RandomContactFactory {

    public static List<Contact> generateRandomContacts(Integer num, String lastName) {
        List<Contact> contacts = new List<Contact>();
        for (Integer i = 0; i < num; i++) {
            Contact c = new Contact(FirstName=i.format(), LastName=lastName);
contacts.add(c);
        }
    }
}

```

```
        return contacts;
    }
}
```

ASYNCHRONOUS APEX

•USE FUTURE METHODS:

1.AccountProcessor.apxc

```
public without sharing class AccountProcessor {
    //Add annotation to declare a future method
    @future(callout=false)
    public static void countContacts(List<Id> accountIds){
        //Query all accounts in the list of Ids passed
        Map<Id, Account> accountMap = new Map<Id, Account>([SELECT Id, (SELECT Id
        FROM Contacts) FROM Account WHERE Id IN:accountIds]);

        List<Account> listName = new List<Account>();

        //Loop through list of accounts
        for(Account a: accountMap.values()){
            //Assign field to number of contact
            a.Number_of_Contacts__c=accountMap.get(a.Id).Contacts.size();
        }
        //Update Accounts
        update accountMap.values();
    }
}
```

2.AccountProcessorTest.apxc

```
@isTest
public class AccountProcessorTest {
    @isTest
    public static void testNoOfContacts(){
        Account a = new Account();
        a.Name = 'Test Account';
        Insert a;

        Contact c = new Contact();
        c.FirstName = 'Bob';
        c.LastName = 'Willie';
        c.AccountId = a.Id;

        Contact c2 = new Contact();
        c2.FirstName = 'Tom';
        c2.LastName = 'Cruise';
        c2.AccountId = a.Id;

        List<Id> acctIds = new List<Id>();
        acctIds.add(a.Id);

        Test.startTest();
        AccountProcessor.countContacts(acctIds);
        Test.stopTest();
    }
}
```

•USE BATCH APEX:

1.LeadProcessor.apxc

```
global class LeadProcessor implements Database.Batchable<sObject>,
Database.Stateful {    // instance member to retain state across
transactions

    global Integer recordsProcessed = 0;

    global Database.QueryLocator start(Database.BatchableContext bc) {
        return Database.getQueryLocator('SELECT Id, LeadSource FROM Lead');
    }

    global void execute(Database.BatchableContext bc, List<Lead> scope){
        // process each batch of records
        List<Lead> leads = new List<Lead>();
        for (Lead lead : scope) {

            lead.LeadSource = 'Dreamforce';
            // increment the instance member counter
            recordsProcessed = recordsProcessed + 1;

        }
        update leads;
    }
    global void finish(Database.BatchableContext bc){
        System.debug(recordsProcessed + ' records processed. Shazam!');
    }
}
```

2.LeadProcessorTest.apxc

```

@isTest
public class LeadProcessorTest {
    @testSetup
    static void setup() {
        List<Lead> leads = new List<Lead>();
        // insert 200 leads
        for (Integer i=0;i<200;i++) {
            leads.add(new Lead(LastName='Lead '+i,
                               Company='Lead', Status='Open - Not Contacted'));
        }
        insert leads;
    }

    static testmethod void test() {
        Test.startTest();
        LeadProcessor lp = new LeadProcessor();
        Id batchId = Database.executeBatch(lp, 200);
        Test.stopTest();

        // after the testing stops, assert records were updated properly
        System.assertEquals(200, [select count() from lead where LeadSource =
'Dreamforce']);
    }
}

```

•CONTROL PROCESSES WITH QUEUEABLE APEX:

1.AddPrimaryContact.apxc

```

public class AddPrimaryContact implements Queueable {

    private Contact contactObj;
    private String state_code;

```

```

public AddPrimaryContact(Contact c, String s) {
    this.contactObj = c;
    this.state_code = s;
}

public void execute(QueueableContext context) {
    List<Account> accounts = [SELECT Id
                              FROM Account
                              WHERE BillingState = :this.state_code
                              LIMIT 200];
    List<Contact> contacts = new
    List<Contact>();
    for (Account a : accounts) {
        Contact c = this.contactObj.clone(false, false, false, false);
        c.AccountId = a.Id;
        contacts.add(c);
    }

    if (contacts.size() > 0) {
        insert contacts;
    }
}
}

```

2.AddPrimaryContactTest.apxc

```

@isTest
public class AddPrimaryContactTest{
    @testSetup
    static void setup(){
        List<Account> lstOfAcc = new List<Account>();
        for(Integer i = 1; i <= 100; i++){
            if(i <= 50)
                lstOfAcc.add(new Account(name='AC'+i, BillingState = 'NY'));
            else

```



```

        lstOfAcc.add(new Account(name='AC'+i, BillingState = 'CA'));
    }

    INSERT lstOfAcc;
}

static testmethod void testAddPrimaryContact(){
    Contact con = new Contact(LastName = 'TestCont');
    AddPrimaryContact addPCIns = new AddPrimaryContact(CON , 'CA');

    Test.startTest();
    System.enqueueJob(addPCIns);
    Test.stopTest();

    System.assertEquals(50, [select count() from Contact]);
}
}

```

•SCHEDULE JOBS USING APEX SCHEDULER:

1.DailyLeadProcessor.apxc

```

public class DailyLeadProcessor implements Schedulable {
    Public void execute(SchedulableContext SC){
        List<Lead> LeadObj=[SELECT Id from Lead where LeadSource=null limit 200];
        for(Lead l:LeadObj){
            l.LeadSource='Dreamforce';
            update l;
        }
    }
}

```

2.DailyLeadProcessorTest.apxc

```

@isTest
private class DailyLeadProcessorTest { static
    testMethod void testDailyLeadProcessor() {
        String CRON_EXP = '0 0 1 * * ?';
        List<Lead> IList = new List<Lead>();
        for (Integer i = 0; i < 200; i++) { IList.add(new Lead(LastName='Dreamforce'+i,
Company='Test1 Inc.', Status='Open - Not Contacted'));
        }
        insert IList;

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

```

APEX INTEGRATION SERVICES

•APEX REST CALLOUTS:

1.AnimalLocator.apxc

```

public class AnimalLocator {
    public static String getAnimalNameById(Integer animalId) {
        String animalName;
        Http http = new Http();
        HttpRequest request = new HttpRequest();    request.setEndpoint('https://th-
apex-httpcallout.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. AnimalLocatorMock.apxc

```

@isTest
global class AnimalLocatorMock implements HttpCalloutMock {
    global HTTPResponse respond(HTTPRequest request) {
        HttpResponse response = new HttpResponse();
        response.setHeader('Content-Type', 'application/json');
        response.setBody('{"animal":{"id":1,"name":"chicken","eats":"chicken food","says":"cluck cluck"}}');
        response.setStatusCode(200);
        return response;
    }
}

```

3. AnimalLocatorTest.apxc

```

@isTest
private class AnimalLocatorTest {
    @isTest static void getAnimalNameById() {
        // Set mock callout class
        Test.setMock(HttpCalloutMock.class, new AnimalLocatorMock());
        // This causes a fake response to be sent
        // from the class that implements HttpCalloutMock.
        String response = AnimalLocator.getAnimalNameById(1);
        // Verify that the response received contains fake values
        System.assertEquals('chicken', response);
    }
}

```

•APEX SOAP CALLOUTS:

1.ParkLocator.apxc

```
public class ParkLocator {  
    public static String [] country (String x) {  
        String parks = x; // {'Yellowstone','Kanha','Mount Fuji'};  
        ParkService.ParksImplPort findCountries = new ParkService.ParksImplPort ();  
        return findCountries.byCountry (parks);  
    }  
}
```

2.ParkLocatorTest.apxc

```
@isTest  
public class ParkLocatorTest {  
    @isTest static void testCallout () {  
        // This causes a fake response to be generated  
        Test.setMock (WebServiceMock.class, new ParkServiceMock ());  
        String x ='Yellowstone';  
        List <String> result = ParkLocator.country(x);  
  
        string resultstring = string.join (result,',');  
        System.assertEquals ('USA', resultstring);  
    }  
}
```

3.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) {
    ParkService.byCountryResponse response_x =new ParkService.byCountryResponse
();
    response_x.return_x = new List <String> {'USA'};
    response.put ('response_x', response_x);
}
}

```

•APEX WEB SERVICES:

1.AccountManager.apxc

```

@RestResource(urlMapping='/Accounts/*/contacts') global
with sharing class AccountManager{
    @HttpGet
    global static Account getAccount(){
        RestRequest req = RestContext.request;
        String acclid = req.requestURI.substringBetween('Accounts/', '/contacts');
        Account acc = [SELECT Id, Name, (SELECT Id, Name FROM Contacts)
            FROM Account WHERE Id = :acclid];

        return acc;
    }
}

```

2.AccountManagerTest.apxc

```

@IsTest
private class AccountManagerTest{
    @IsTest static void testAccountManager(){
        Id recordId = getTestAccountId();
        // Set up a test request
        RestRequest request = new RestRequest();
        request.requestUri =
            'https://ap5.salesforce.com/services/apexrest/Accounts/'+ recordId +'/contacts';
        request.httpMethod = 'GET';
        RestContext.request = request;

        // Call the method to test
        Account acc = AccountManager.getAccount();

        // Verify results
        System.assert(acc != null);
    }

    private static Id getTestAccountId(){
        Account acc = new Account(Name = 'TestAcc2');
        Insert acc;

        Contact con = new Contact(LastName = 'TestCont2', AccountId = acc.Id);
        Insert con;

        return acc.Id;
    }
}

```

APEX SPECIALIST SUPERBADGE

•AUTOMATE RECORD CREATION:

1.MaintenanceRequest.apxt

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

2.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;
}
}
}
}

```

•SYNCHRONIZATION SALESFORCE DATA WITH AN EXTERNAL SYSTEM:

1.WarehouseCalloutService.apxc

```

public with sharing class WarehouseCalloutService implements Queueable {
    private static final String WAREHOUSE_URL = 'https://th-
superbadgeapex.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:

1.WarehouseSyncSchedule.apxc

```

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

        System.enqueueJob(new WarehouseCalloutService());
    }
}

```

•TEST AUTOMATION LOGIC:

1.MaintenanceRequestHelperTest.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;
}
}
}

```

2.MaintenanceRequestHelper.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);
}
}

```

3.MaintenanceRequest.apxt

```

trigger MaintenanceRequest on Case (before update, after update) {
    // ToDo: Call MaintenanceRequestHelper.updateWorkOrders
    if(Trigger.isUpdate && Trigger.isAfter){

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

    }
}

```

•TEST CALLOUT LOGIC:

1.WarehouseCalloutService.apxc

```

public with sharing class WarehouseCalloutService implements Queueable {
    private static final String WAREHOUSE_URL = 'https://th-
superbadgeapex.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();
}
}

```

2.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]);
    }
}

```

3.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:

1.WarehouseSyncSchedule.apxc

```

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

        System.enqueueJob(new WarehouseCalloutService());
    }
}

```

2.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 ');

}
}
```