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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> lList = new List<Lead>();
        for (Integer i = 0; i < 200; i++) { lList.add(new Lead(LastName='Dreamforce'+i,
Company='Test1 Inc.', Status='Open - Not Contacted'));
        }
        insert lList;

        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

```

@Test
private class AnimalLocatorTest {
@Test 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 accId = req.requestURI.substringBetween('Accounts/', '/contacts');
        Account acc = [SELECT Id, Name, (SELECT Id, Name FROM Contacts)
                        FROM Account WHERE Id = :accId];

        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(Triple.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 ');  
  
    }  
}
```


