

## APEX TRIGGERS

### 1. Get Started with Apex Triggers

Name : 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

Name : 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

Name : 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;
    }
}
```

Name : TestVerifyDate

@isTest

```
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

Name : 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);  
        }  
    }  
  
}
```

Name : TestRestrictContactByName

```
@isTest  
public class TestRestrictContactByName {  
  
    @isTest static void Test_insertupdateContact(){  
        Contact cnt = new Contact();  
        cnt.LastName = 'INVALIDNAME';  
  
        Test.startTest();  
        Database.SaveResult result = Database.insert(cnt, false);  
        Test.stopTest();  
  
        System.assert(!result.isSuccess());  
    }  
}
```

```

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

```

### 3.Create Test Data for apex Tests

Name : RandomContactFactory

```

public class RandomContactFactory {

    public static List<Contact> generateRandomContacts(Integer numcnt, string
lastname){
        List<Contact> contacts = new List<Contact>();
        for(Integer i=0;i<numcnt;i++){
            Contact cnt = new Contact(FirstName = 'Test '+i, LastName = lastname);
            contacts.add(cnt);
        }
        return contacts;
    }
}

```

## Asynchronous Apex

### 1.Use Future Methods

Name : 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;
}
}

```

Name : AccountProcessorTest

```

@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();
    }
}

```

## 2. Use Batch Apex

Name : 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);
    }
}

```

Name : LeadProcessorTest

```

@Test
public class LeadProcessorTest {

    @Test
    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. Contol Processor With Queueable Apex

Name :   AddPrimaryContact

```

public class AddPrimaryContact implements Queueable{

    private Contact con;
    private String state;

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

```



```

    }

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

        for(Account acc:accounts){
            contact c = con.clone();
            c.AccountId = acc.Id;
            primaryContacts.add(c);
        }
        if(primaryContacts.size() > 0){
            insert primaryContacts;
        }
    }
}

```

Name : AddPrimaryContactTest

```

@isTest
public class AddPrimaryContactTest {

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

.Schedule Jobs Using the Apex scheduler

Name : DailyLeadProcessor

```
global class DailyLeadProcessor implements Schedulable{  
    global void execute(SchedulableContext ctx){  
        List<lead> leadstoupdate = new List<lead>();  
        List<Lead> leads = [Select id from Lead Where LeadSource = NULL Limit 200];  
  
        for(Lead l:leads){  
            l.LeadSource = 'Dreamforce';  
            leadstoupdate.add(l);  
        }  
        update leadstoupdate;  
    }  
}
```

Name : DailyLeadProcessorTest

```

@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 OVERVIEW

### 1.Apex REST Callouts

Name : 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');
    }
}

```

```
}  
}
```

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 );  
    }  
}
```

Name : 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;  
    }  
}
```

## 2.Apex SOAP Callouts

Name : ParkLocator

```
public class ParkLocator {
```

```

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

```

Name : 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);
    }
}

```

Name : 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);
}
}

```

Name : AsyncParkService

//Generated by wsdl2apex

```

public class AsyncParkService {
    public class byCountryResponseFuture extends System.WebServiceCalloutFuture {
        public String[] getValue() {
            ParkService.byCountryResponse response =
(ParkService.byCountryResponse)System.WebServiceCallout.endInvoke(this);
            return response.return_x;
        }
    }
    public class AsyncParksImplPort {
        public String endpoint_x = 'https://th-apex-soap-
service.herokuapp.com/service/parks';
        public Map<String,String> inputHttpHeaders_x;
        public String clientCertName_x;
        public Integer timeout_x;
        private String[] ns_map_type_info = new String[]{'http://parks.services/',
'ParkService'};
        public AsyncParkService.byCountryResponseFuture
beginByCountry(System.Continuation continuation,String arg0) {
            ParkService.byCountry request_x = new ParkService.byCountry();

```

```

        request_x.arg0 = arg0;
        return (AsyncParkService.byCountryResponseFuture)
System.WebServiceCallout.beginInvoke(
    this,
    request_x,
    AsyncParkService.byCountryResponseFuture.class,
    continuation,
    new String[]{endpoint_x,
        "",
        'http://parks.services/',
        'byCountry',
        'http://parks.services/',
        'byCountryResponse',
        'ParkService.byCountryResponse'}
    );
    }
}
}

```

### 3.Apex Web Services

Name : AccountManager

```

@RestResource(urlMapping='/Accounts/*/contacts')
global 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;
    }
}

```

Name : AccountManagerTest

```

@isTest
private class AccountManagerTest {

    private static testMethod void getAccountTest1() {
        Id recordId = createTestRecord();
        // Set up a test request
        RestRequest request = new RestRequest();
        request.requestUri = 'https://na1.salesforce.com/services/apexrest/Accounts/'+
recordId + '/contacts' ;
        request.httpMethod = 'GET';
        RestContext.request = request;
        // Call the method to test
        Account thisAccount = AccountManager.getAccount();
        // Verify results
        System.assert(thisAccount != null);
        System.assertEquals('Test record', thisAccount.Name);

    }

    // Helper method
    static Id createTestRecord() {
        // Create test record
        Account TestAcc = new Account(
            Name='Test record');
        insert TestAcc;
        Contact TestCon= new Contact(
            LastName='Test',
            AccountId = TestAcc.id);
        return TestAcc.Id;
    }
}

```



## APEX SPECIALIST

### 1. Automated Record Creation

Name : 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;
  }
}
}

```

Name : MaintenanceRequest

trigger MaintenanceRequest on Case (before update, after update) {

```

    if(Trigger.isUpdate && Trigger.isAfter){

```

```

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

```

```

    }

```

```

}

```

2.Synchronize Saleesforce data with an External System

Name : WarehouseCalloutService

```

public with sharing class WarehouseCalloutService implements Queueable {

```

```

    private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';

```

```

    //class that makes a REST callout to an external warehouse system to get a list of
equipment that needs to be updated.

```

```

    //The callout's JSON response returns the equipment records that you upsert in
Salesforce.

```

```

    @future(callout=true)

```

```

    public static void runWarehouseEquipmentSync(){

```

```

        Http http = new Http();

```

```

        HttpRequest request = new HttpRequest();

```

```

        request.setEndpoint(WAREHOUSE_URL);

```

```

request.setMethod('GET');
HttpResponse response = http.send(request);

List<Product2> warehouseEq = new List<Product2>();

if (response.getStatusCode() == 200){
    List<Object> jsonResponse =
(List<Object>).JSON.deserializeUntyped(response.getBody());
    System.debug(response.getBody());

    //class maps the following fields: replacement part (always true), cost, current
inventory, lifespan, maintenance cycle, and warehouse SKU
    //warehouse SKU will be external ID for identifying which equipment records to
update within Salesforce
    for (Object eq : jsonResponse){
        Map<String,Object> mapJson = (Map<String,Object>)eq;
        Product2 myEq = new Product2();
        myEq.Replacement_Part__c = (Boolean) mapJson.get('replacement');
        myEq.Name = (String) mapJson.get('name');
        myEq.Maintenance_Cycle__c = (Integer) mapJson.get('maintenanceperiod');
        myEq.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
        myEq.Cost__c = (Integer) mapJson.get('cost');
        myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
        myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
        myEq.ProductCode = (String) mapJson.get('_id');
        warehouseEq.add(myEq);
    }

    if (warehouseEq.size() > 0){
        upsert warehouseEq;
        System.debug('Your equipment was synced with the warehouse one');
    }
}

}

public static void execute (QueueableContext context){
    runWarehouseEquipmentSync();
}

```

}

```
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);
}
}

```

Name : 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;
}
}
}

```

Name : MaintenanceRequest

trigger MaintenanceRequest on Case (before update, after update) {

```

    if (Trigger.isUpdate && Trigger.isAfter) {
        MaintenanceRequestHelper.updateWorkOrders(Trigger.New, Trigger.OldMap);
    }
}

```

## 5. Test Callout Logic

Name : 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);
    }

}
}
}

```

Name : 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]);
    }
}

```

Name : 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;
    }
}

```

## 6.Test Schedling Logic

Name : WarehouseSyncSchedule

```

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}

```

Name : 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 ');

    }
}

```

