

Apex Triggers :

https://trailhead.salesforce.com/content/learn/modules/apex_triggers?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1) Get Started with Apex Trigger

AccountAddressTrigger Code :

```
trigger AccountAddressTrigger on Account (before insert, before update) {
    for (Account a : Trigger.new) {
        if (a.Match_Billing_Address__c == TRUE){
            a.ShippingPostalCode = a.BillingPostalCode;
        }
    }
}
```

2) Bulk Apex Triggers Unit

ClosedOpportunityTrigger Code :

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

    for (Opportunity o :[SELECT Id,Name FROM Opportunity
        WHERE Id IN :Trigger.New]){
        taskList.add(new Task(Subject='Follow Up Test Task',
            WhatId=o.Id,
            Status='Not Started',
            Priority='Normal'));
    }
    if (taskList.size() > 0){
        insert taskList;
    }
}
```

Apex Testing :

https://trailhead.salesforce.com/content/learn/modules/apex_testing?trailmix_creator_

id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Get Started with Apex Unit Testing

VerifyDate Code :

```
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
    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
    private static Date SetEndOfMonthDate(Date date1) {
        Integer totalDays = Date.daysInMonth(date1.year(), date1.month());
        Date lastDay = Date.newInstance(date1.year(), date1.month(), totalDays);
        return lastDay;
    }
}
```

TestVerifyDate Code :

```
@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);
    }

}
```

2) Test Apex Triggers Unit

RestrictContactByName Code :

```
trigger RestrictContactByName on Contact (before insert, before update) {

    //check contacts prior to insert or update for invalid data
    For (Contact c : Trigger.New) {
        if(c.LastName == 'INVALIDNAME') {    //invalidname is invalid
            c.AddError('The Last Name "'+c.LastName+'" is not allowed for
DML');
        }
    }

}
```

```
}
```

TestRestrictContactByName Code :

```
@isTest
```

```
private class TestRestrictContactByName {
```

```
    @isTest
```

```
    static void invalidName() {
```

```
        try {
```

```
            Contact c = new Contact(LastName='INVALIDNAME');
```

```
            insert c;
```

```
        }
```

```
        catch (Exception e) {
```

```
            System.assert(true);
```

```
        }
```

```
    }
```

```
}
```

3) Create Test Data for Apex Tests :

RandomContactFactory Code :

```
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 :

https://trailhead.salesforce.com/content/learn/modules/asynchronous_apex?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz

2)Use Future Methods

AccountProcessor Code :

```
public class AccountProcessor {
    @future
    public static void countContacts(List<Id> accountIds) {
        List<Account> accounts = [SELECT Id,
                                   Name,
                                   Number_of_Contacts__c,
                                   (
                                       SELECT Contact.Id
                                       FROM Contacts
                                   )
                                   FROM Account
                                   WHERE Id in :accountIds];
        for (Account a : accounts) {
            a.Number_of_Contacts__c = a.Contacts.size();
        }
        update accounts;
    }
}
```

AccountProcessorTest Code :

```
@isTest
private class AccountProcessorTest {

    static TestMethod void myTest() {
        List<Account> accounts = new List<Account>();
        for (Integer i=0; i<100; i++) {
```

```

    Account account = new Account();
    account.Name = 'AccountProcessorTest Account ' + i;
    accounts.add(account);
}
insert accounts;

List<Id> accountIds = new List<Id>();
List<Contact> contacts = new List<Contact>();
for (Account a : accounts) {
    accountIds.add(a.Id);
    for (Integer i=0; i<5; i++) {
        Contact contact = new Contact();
        contact.FirstName = 'AccountProcessor Test Contact';
        contact.LastName = String.valueOf(i);
        contact.AccountId = a.Id;
        contacts.add(contact);
    }
}
insert contacts;

Test.startTest();
AccountProcessor.countContacts(accountIds);
Test.stopTest();

List<Account> results = [SELECT Id, Number_of_Contacts__c
                        FROM Account
                        WHERE Id in :accountIds];
for (Account a : results) {
    System.AssertEquals(5, a.Number_of_Contacts__c);
}
}
}

```

3)Use Batch Apex

LeadProcessor Code :

global class LeadProcessor implements Database.Batchable<sObject>,

```

Database.Stateful {

    global Integer recs_processed = 0;

    global Database.QueryLocator start(Database.BatchableContext bc) {
        String sQuery = "";
        sQuery += 'SELECT Id, Name, Status,';
        sQuery += 'LeadSource ';
        sQuery += 'FROM Lead ';
        sQuery += 'LIMIT 100000';
        return Database.getQueryLocator(sQuery);
    }

    global void execute(Database.BatchableContext bc, List<Lead> scope) {
        for (Lead l : scope) {
            l.LeadSource = 'Dreamforce';
            recs_processed += 1;
        }
        update scope;
    }

    global void finish(Database.BatchableContext bc) {
        AsyncApexJob job = [SELECT Id,
                                Status,
                                NumberOfErrors,
                                TotalJobItems,
                                JobItemsProcessed,
                                CreatedBy.Email
                                FROM AsyncApexJob
                                WHERE Id = :bc.getJobId()];

        String s = "";
        s += job.JobItemsProcessed + ' job items processed ';
        s += 'out of ' + job.TotalJobItems + ' total job items. ';
        s += job.NumberOfErrors + ' error(s) encountered. ';
        System.debug(s);
        s = recs_processed + ' record(s) processed.';
        System.debug(s);
    }
}

```

```
}  
}
```

LeadProcessorTest Code :

```
@isTest  
private class LeadProcessorTest {  
  
    @testSetup  
    static void createLeads() {  
        List<Lead> leads = new List<Lead>();  
        for (Integer i=0; i<200; i++) {  
            Lead l = new Lead();  
            l.FirstName = 'Test';  
            l.LastName = 'Lead';  
            l.Company = 'Test Lead ' + i;  
            leads.add(l);  
        }  
        insert leads;  
    }  
  
    static TestMethod void myTest() {  
        Test.startTest();  
        LeadProcessor lp = new LeadProcessor();  
        Id batchId = Database.executeBatch(lp);  
        Test.stopTest();  
  
        System.assertEquals(200, [SELECT Count()  
                                FROM Lead  
                                WHERE Name = 'Test Lead'  
                                AND LeadSource = 'Dreamforce']);  
    }  
}
```

4)Controp Processes with Queueable Apex

AddPrimaryContact Code :


```

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;
        }
    }
}

```

AddPrimaryContactTest Code :

```

@Test
private class AddPrimaryContactTest {
    @testSetup
    static void setup() {
        List<Account> accounts = new List<Account>();
        for (Integer i=0; i<50; i++) {
            Account ny = new Account();

```

```

        ny.Name = 'Test Account (NY)';
        ny.BillingState = 'NY';
        accounts.add(ny);
        Account ca = new Account();
        ca.Name = 'Test Account (CA)';
        ca.BillingState = 'CA';
        accounts.add(ca);
    }
    insert accounts;
}

```

```

static TestMethod void myTest() {
    Contact contactObj = new Contact(
        FirstName = 'California',
        LastName = 'Bob'
    );
    String state_abbrev = 'CA';

    Test.startTest();
    AddPrimaryContact apc = new AddPrimaryContact(contactObj, state_abbrev);
    Id jobId = System.enqueueJob(apc);
    Test.stopTest();
}

```

```

    List<Account> accounts = [SELECT Id, (SELECT Contact.Name FROM
Account.Contacts) FROM Account WHERE BillingState = 'CA'];
    System.assertEquals(50, accounts.size());
    for (Account a : accounts) {
        System.assertEquals(a.Contacts.size(), 1);
    }
}
}

```

5)Schedule Jobs Using the Apex Scheduler

DailyLeadProcessor Code :

```

global class DailyLeadProcessor implements Schedulable {

```

```

global void execute(SchedulableContext ctx) {
    List<Lead> leads = [SELECT Id,
                          LeadSource
                        FROM Lead
                        WHERE LeadSource = " OR LeadSource = null
                        LIMIT 200];
    for (Lead l : leads) {
        l.LeadSource = 'Dreamforce';
    }

    if (leads.size() > 0) {
        update leads;
    }
}
}

```

DailyLeadProcessorTest Code :

```

@Test
private class DailyLeadProcessorTest {

    @testSetup
    static void setup() {
        List<Lead> leads = new List<Lead>();
        for (Integer i=0; i<200; i++) {
            Lead l = new Lead();
            l.FirstName = 'Test';
            l.LastName = 'Lead ' + i;
            l.Company = 'Test Company ' + i;
            leads.add(l);
        }
        insert leads;
    }

    static TestMethod void myTest() {

```

```

String jobName = 'Daily Lead Processor - Test';
String CRON_EXP = '0 0 0 15 3 ? 2017'; // dummy cron entry

test.startTest();
DailyLeadProcessor dp = new DailyLeadProcessor();
String JobId = System.schedule(jobName, CRON_EXP, dp);
test.stopTest();

List<Lead> results = [SELECT Id FROM Lead WHERE LeadSource = 'Dreamforce'];
System.assertEquals(200, results.size());
}
}

```

Apex Integration Services

:https://trailhead.salesforce.com/content/learn/modules/apex_integration_services?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz

2)Apex REST Callouts

AnimalLocator Code :

```

public class AnimalLocator {

    public static HttpResponse makeGetCallout {
        Http http = new Http();
        HttpRequest request = new HttpRequest();
        request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/:id');
        request.setMethod('GET');
        HttpResponse response = http.send(request);
        // If the request is successful, parse the JSON response.
        if (response.getStatusCode() == 200) {
            // Deserialize the JSON string into collections of primitive data types.
            Map<Integer, Object> Results

```

```

    }
}
}

```

AnimalLocatorTest Code :

```

@Test
private class AnimalLocatorTest{
    @Test static void AnimalLocatorMock1() {
        Test.SetMock(HttpCalloutMock.class, new AnimalLocatorMock());
        String result=AnimalLocator.getAnimalNameById(3);
        String expectedResult='chicken';
        System.assertEquals(result, expectedResult);
    }
}

```

AnimalLocatorMock Code :

```

@Test
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;
    }
}

```

2)Apex SOAP Callouts

ParkService Code :

//Generated by wsdl2apex

```

public class ParkService {
    public class byCountryResponse {
        public String[] return_x;
        private String[] return_x_type_info = new
String[]{'return','http://parks.services/',null,'0','-1','false'};

```

```

        private String[] apex_schema_type_info = new
String[]{ 'http://parks.services/', 'false', 'false' };
        private String[] field_order_type_info = new String[] { 'return_x' };
    }
    public class byCountry {
        public String arg0;
        private String[] arg0_type_info = new
String[] { 'arg0', 'http://parks.services/', null, '0', '1', 'false' };
        private String[] apex_schema_type_info = new
String[] { 'http://parks.services/', 'false', 'false' };
        private String[] field_order_type_info = new String[] { 'arg0' };
    }
    public class ParksImplPort {
        public String endpoint_x = 'https://th-apex-soap-
service.herokuapp.com/service/parks';
        public Map<String,String> inputHttpHeaders_x;
        public Map<String,String> outputHttpHeaders_x;
        public String clientCertName_x;
        public String clientCert_x;
        public String clientCertPasswd_x;
        public Integer timeout_x;
        private String[] ns_map_type_info = new String[] { 'http://parks.services/',
'ParkService' };
        public String[] byCountry(String arg0) {
            ParkService.byCountry request_x = new ParkService.byCountry();
            request_x.arg0 = arg0;
            ParkService.byCountryResponse response_x;
            Map<String, ParkService.byCountryResponse> response_map_x = new
Map<String, ParkService.byCountryResponse>();
            response_map_x.put('response_x', response_x);
            WebServiceCallout.invoke(
                this,
                request_x,
                response_map_x,
                new String[] { endpoint_x,
                    "",
                    'http://parks.services/' },

```

```

        'byCountry',
        'http://parks.services/',
        'byCountryResponse',
        'ParkService.byCountryResponse'}
    );
    response_x = response_map_x.get('response_x');
    return response_x.return_x;
}
}
}

```

ParkLocator Code :

```

public class ParkLocator {
    public static String[] country(String country){
        ParkService.ParksImplPort parks = new ParkService.ParksImplPort();
        String[] parksname = parks.byCountry(country);
        return parksname;
    }
}

```

ParkLocatorTest Code :

```

@Test
private class ParkLocatorTest{
    @Test
    static void testParkLocator() {
        Test.setMock(WebServiceMock.class, new ParkServiceMock());
        String[] arrayOfParks = ParkLocator.country('India');

        System.assertEquals('Park1', arrayOfParks[0]);
    }
}

```

ParkServiceMock Code :

```

@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) {
    ParkService.byCountryResponse response_x = new
ParkService.byCountryResponse();
    List<String> lstOfDummyParks = new List<String> {'Park1','Park2','Park3'};
    response_x.return_x = lstOfDummyParks;

    response.put('response_x', response_x);
}
}

```

4) Apex Web Services

AccountManager Code :

```

@RestResource(urlMapping='/Accounts/*/contacts')
global with sharing class AccountManager {
    @HttpGet
    global static account getAccount() {
        RestRequest request = RestContext.request;
        String accountId =
request.requestURI.substring(request.requestURI.lastIndexOf('/')-18,
        request.requestURI.lastIndexOf('/'));
        List<Account> a = [select id, name, (select id, name from contacts) from account
where id = :accountId];
        List<contact> co = [select id, name from contact where account.id = :accountId];
        system.debug('** a[0]= '+ a[0]);
        return a[0];
    }
}
}

```


AccountManagerTest Code :

@IsTest(SeeAllData=true)

public class AccountManagerTest {

 @IsTest

 public static void testaccountmanager() {

 RestRequest request = new RestRequest();

 request.requestUri = 'https://mannharleen-dev-ed.my.salesforce.com/services/apexrest/Accounts/00190000016cw4tAAA/contacts';

 request.httpMethod = 'GET';

 RestContext.request = request;

 system.debug('test account result = '+ AccountManager.getAccount());

 }

}

APEX SPECIALIST SUPERBADGE :

https://trailhead.salesforce.com/content/learn/modules/apex_integration_services?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz

2)Automate Record Creation

MaintenanceRequestHelper Code :

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,
Equipmentc, Equipmenttr.Maintenance_Cyclec,(SELECT Id,Equipmentc,Quantityc 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(Equipmenttr.Maintenance_Cyclec)cycle FROM Equipment_Maintenance_Itemc
WHERE Maintenance_Requestc IN :ValidIds GROUP BY Maintenance_Request_c];

    for (AggregateResult ar : results){
        maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal)
ar.get('cycle'));
    }

    for(Case cc : closedCasesM.values()){
        Case nc = new Case (
            ParentId = cc.Id,
            Status = 'New',
            Subject = 'Routine Maintenance',
            Type = 'Routine Maintenance',
            Vehicle_c = cc.Vehicle_c,
            Equipment_c =cc.Equipment_c,
            Origin = 'Web',
            Date_Reported__c = Date.Today()

        );

        If (maintenanceCycles.containsKey(cc.Id)){
            nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.Id));
        }
    }
}

```

```

        newCases.add(nc);
    }

    insert newCases;

    List<Equipment_Maintenance_Item_c> clonedWPs = new
    List<Equipment_Maintenance_Item_c>();
    for (Case nc : newCases){
        for (Equipment_Maintenance_Item_c wp :
        closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items_r){
            Equipment_Maintenance_Item__c wpClone = wp.clone();
            wpClone.Maintenance_Request__c = nc.Id;
            ClonedWPs.add(wpClone);

        }
    }
    insert ClonedWPs;
}
}
}

```

MaintenanceRequest Code :

```

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

```

3)Synchronize Salesforce Data

WarehouseCalloutService Code :

```
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);
        }
    }
}
}
}

```

4)Schedule Synchronization

WarehouseSyncSchedule Code :

```

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}

```

5)Test Automatic Logic

MaintenanceRequestHelperTest Code :

```

@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_Itemc(Equipment_c = equipmentId,
        Maintenance_Request__c = requestId);
    return wp;
}
```

MaintenanceRequestHelper Code :

```
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,
Equipmentc, Equipmentr.Maintenance_Cyclec,(SELECT Id,Equipmentc,Quantityc 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(Equipmentr.Maintenance_Cyclec)cycle FROM Equipment_Maintenance_Itemc
WHERE Maintenance_Requestc IN :ValidIds GROUP BY Maintenance_Request_c];

        for (AggregateResult ar : results){
            maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal)
ar.get('cycle'));
        }

        for(Case cc : closedCasesM.values()){
            Case nc = new Case (
                ParentId = cc.Id,
                Status = 'New',
                Subject = 'Routine Maintenance',
                Type = 'Routine Maintenance',
                Vehicle_c = cc.Vehicle_c,
                Equipment_c =cc.Equipment_c,
                Origin = 'Web',
                Date_Reported__c = Date.Today()

            );

```

```

        If (maintenanceCycles.containsKey(cc.Id)){
            nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.Id));
        }

        newCases.add(nc);
    }

    insert newCases;

    List<Equipment_Maintenance_Item_c> clonedWPs = new
List<Equipment_Maintenance_Item_c>();
    for (Case nc : newCases){
        for (Equipment_Maintenance_Item_c wp :
closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items_r){
            Equipment_Maintenance_Item__c wpClone = wp.clone();
            wpClone.Maintenance_Request__c = nc.Id;
            ClonedWPs.add(wpClone);

        }
    }
    insert ClonedWPs;
}
}
}
}

```

MaintenanceRequest Code :

```

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

```

6) Test Callout Logic

WarehouseCalloutService Code :


```

public with sharing class WarehouseCalloutService {

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

    //@future(callout=true)
    public static void runWarehouseEquipmentSync(){

        Http http = new Http();
        HttpRequest request = new HttpRequest();

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

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

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

            for (Object eq : jsonResponse){
                Map<String,Object> mapJson = (Map<String,Object>)eq;
                Product2 myEq = new Product2();
                myEq.Replacement_Part__c = (Boolean) mapJson.get('replacement');
                myEq.Name = (String) mapJson.get('name');
                myEq.Maintenance_Cycle__c = (Integer) mapJson.get('maintenanceperiod');
                myEq.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
                myEq.Cost__c = (Decimal) mapJson.get('lifespan');
                myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
                myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
                warehouseEq.add(myEq);
            }

            if (warehouseEq.size() > 0){
                upsert warehouseEq;
            }
        }
    }
}

```

```

        System.debug('Your equipment was synced with the warehouse one');
        System.debug(warehouseEq);
    }

}

}
}
}

```

WarehouseCalloutServiceTest Code :

@isTest

```

private class WarehouseCalloutServiceTest {
    @isTest
    static void testWareHouseCallout(){
        Test.startTest();
        // implement mock callout test here
        Test.setMock(HTTPCalloutMock.class, new WarehouseCalloutServiceMock());
        WarehouseCalloutService.runWarehouseEquipmentSync();
        Test.stopTest();
        System.assertEquals(1, [SELECT count() FROM Product2]);
    }
}

```

WarehouseCalloutServiceMock Code :

@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;
}
}

```

7) Test Scheduling Logic

WarehouseSyncSchedule Code :

```

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}

```

WarehouseSyncScheduleTest Code :

```

@Test
public class WarehouseSyncScheduleTest {

    @Test 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 ');
    }
}

```

}
}