

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

```
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 TRIGGER UNIT

```
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:

https://trailhead.salesforce.com/content/learn/module/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 :

```

@Test
public class TestVerifyDate
{
    static testMethod void testMethod1()
    {

```

```

        Date d = VerifyDate.CheckDates(System.today(),System.today()+1);
        Date d1 = VerifyDate.CheckDates(System.today(),System.today()+60);
    }
}

```

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 {

    static testMethod void metodoTest()
    {
        List<Contact> listContact= new List<Contact>();
        Contact c1 = new Contact(FirstName='Francesco', LastName='Riggio' ,
email='Test@test.com');
        Contact c2 = new Contact(FirstName='Francesco1', LastName =
'INVALIDNAME',email='Test@test.com');
        listContact.add(c1);
        listContact.add(c2);
        Test.startTest();
        try

```

```

        {
            insert listContact;
        }
        catch(Exception ee)
        {
        }
    Test.stopTest();
}

```

3)CREATE TEST DATA FOR APEX TESTS:

RandomContactFactory code :

```

public class RandomContactFactory {
    public static List<Contact> generateRandomContacts(Integer
numContactsToGenerate, String FName) {
        List<Contact> contactList = new List<Contact>();
        for(Integer i=0;i<numContactsToGenerate;i++) {
            Contact c = new Contact(FirstName=FName + ' ' + i, LastName = 'Contact '+i);
            contactList.add(c);
            System.debug(c);
        }
        //insert contactList;
        System.debug(contactList.size());
        return contactList;
    }
}

```

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 from Account Where Id IN : accountIds];
        List<Account> updatedAccounts = new List<Account>();
        for(Account account : accounts){
            account.Number_of_Contacts__c = [Select count() from Contact Where AccountId
=: account.Id];
            System.debug('No Of Contacts = ' + account.Number_of_Contacts__c);
            updatedAccounts.add(account);
        }
        update updatedAccounts;
    }
}
```

AccountProcessor Test code:

```
@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();
    }

}

```

3)USE BATCH APEX

LeadProcessor Code:

```

public class LeadProcessor implements Database.Batchable<sObject> {
    public Database.QueryLocator start(Database.BatchableContext bc) {
        // collect the batches of records or objects to be passed to execute
        return Database.getQueryLocator([Select LeadSource From Lead ]);
    }
    public void execute(Database.BatchableContext bc, List<Lead> leads){
        // process each batch of records
        for (Lead Lead : leads) {
            lead.LeadSource = 'Dreamforce';
        }
        update leads;
    }
    public void finish(Database.BatchableContext bc){
    }

}

```

LeadProcessor Test Code:

```

@isTest
public class LeadProcessorTest {
    @testSetup
    static void setup() {
        List<Lead> leads = new List<Lead>();
        for(Integer counter=0 ;counter <200;counter++){
            Lead lead = new Lead();

```

```

        lead.FirstName = 'FirstName';
        lead.LastName = 'LastName'+counter;
        lead.Company
        ='demo'+counter;
        leads.add(lead);
    }
    insert leads;
}
@isTest static void test() {
    Test.startTest();
    LeadProcessor leadProcessor = new LeadProcessor();
    Id batchId = Database.executeBatch(leadProcessor);
    Test.stopTest();
}
}

```

4)CONTROL PROCESSES WITH QUEUEABLE APEX

AddPrimaryContact Code:

```

public class AddPrimaryContact implements Queueable
{
    private Contact c;
    private String state;
    public AddPrimaryContact(Contact c, String state)
    {
        this.c = c;
        this.state = state;
    }
    public void execute(QueueableContext context)
    {
        List<Account> ListAccount = [SELECT ID, Name ,(Select id,FirstName,LastName
from contacts ) FROM ACCOUNT WHERE BillingState = :state LIMIT 200];
        List<Contact> lstContact = new List<Contact>();
        for (Account acc:ListAccount)

```

```

    {
        Contact cont = c.clone(false,false,false,false);
        cont.AccountId = acc.id
    ;
        lstContact.add( cont );
    }
    if(lstContact.size() >0 )
    {
        insert lstContact;
    }
}
}

```

AddPrimaryContactTest Code:

```

@Test
public class AddPrimaryContactTest
{
    @Test static void TestList()
    {
        List<Account> Teste = new List <Account>();
        for(Integer i=0;i<50;i++)
        {
            Teste.add(new Account(BillingState = 'CA', name = 'Test'+i));
        }
        for(Integer j=0;j<50;j++)
        {
            Teste.add(new Account(BillingState = 'NY', name = 'Test'+j));
        }
        insert Teste;

        Contact co = new Contact();
        co.FirstName='demo';
        co.LastName = 'demo';
        insert co;
        String state = 'CA';
    }
}

```



```

        AddPrimaryContact apc = new AddPrimaryContact(co, state);
        Test.startTest();
        System.enqueueJob(apc);
        Test.stopTest();
    }
}

```

5)Schedule Jobs Using the Apex Scheduler

DailyLeadProcessor Code:

```

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;
        }
    }
}

```

DailyLeadProcessorTest Code:

```

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

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

```

```
}  
}
```

Apex Integration Services:

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

AnimalLocatorTest Code:

```
@isTest  
private class AnimalLocatorTest{  
    @isTest  
    static void AnimalLocatorMock1() {  
        Test.setMock(HttpCalloutMock.class, new AnimalLocatorMock());  
    }  
}
```

```

        string result = AnimalLocator.getAnimalNameById(3);
        String expectedResult = 'chicken';
        System.assertEquals(result,expectedResult );
    }
}

```

AnimalLocatorMock Code:

```

@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

ParkServiceMock Code:

```

@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) {
    // 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);
}
}

```

ParkLocatorTest Code:

```

@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);
    }
}

```

ParkService Code:

```

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 theCountry) {
        ParkService.ParksImplPort parkSvc = new ParkService.ParksImplPort(); // remove
space
        return parkSvc.byCountry(theCountry);
    }
}

```

4)APEX WEB SERVICES

AccountManager Code:

```

@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;
    }
}

```

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 SUPERBADGE:

https://trailhead.salesforce.com/content/learn/superbadges/superbadge_apex?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,
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));
    } else {
        nc.Date_Due__c = Date.today().addDays((Integer)
cc.Equipment__r.maintenance_Cycle__c);
    }
    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 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();
}
}

```

4) Schedule Synchronization

WarehouseSyncSchedule:

```

global with sharing class WarehouseSyncSchedule implements Schedulable{
    global void execute(SchedulableContext ctx){
        System.enqueueJob(new WarehouseCalloutService());
    }
}

```

5)Test Automation 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_Item__c(Equipment__c = equipmentId,
        Maintenance_Request__c = requestId);
    return wp;
}
@istest
private static void testMaintenanceRequestPositive(){
    Vehicle__c vehicle = createVehicle();
    insert vehicle;
    id vehicleId = vehicle.Id;

```

```

Product2 equipment = createEq();
insert equipment;
id equipmentId = equipment.Id;
    case somethingToUpdate = createMaintenanceRequest(vehicleId,equipmentId);
insert somethingToUpdate;
    Equipment_Maintenance_Item__c workP =
createWorkPart(equipmentId,somethingToUpdate.id);
insert workP;
test.startTest();
somethingToUpdate.status = CLOSED;
update somethingToUpdate;
test.stopTest();
    Case newReq = [Select id, subject, type, Equipment__c, Date_Reported__c,
Vehicle__c, Date_Due__c
                    from case
                    where status =:STATUS_NEW];
    Equipment_Maintenance_Item__c workPart = [select id
                                                from Equipment_Maintenance_Item__c
                                                where Maintenance_Request__c =:newReq.Id];
system.assert(workPart != null);
system.assert(newReq.Subject != null);
system.assertEquals(newReq.Type, REQUEST_TYPE);
SYSTEM.assertEquals(newReq.Equipment__c, equipmentId);
SYSTEM.assertEquals(newReq.Vehicle__c, vehicleId);
SYSTEM.assertEquals(newReq.Date_Reported__c, system.today());
}
@istest
private static void testMaintenanceRequestNegative(){
    Vehicle__C vehicle = createVehicle();
insert vehicle;
id vehicleId = vehicle.Id;
product2 equipment = createEq();
insert equipment;
id equipmentId = equipment.Id;
case emptyReq = createMaintenanceRequest(vehicleId,equipmentId);
insert emptyReq;
    Equipment_Maintenance_Item__c workP = createWorkPart(equipmentId,

```

```

emptyReq.Id);
    insert workP;
    test.startTest();
    emptyReq.Status = WORKING;
    update emptyReq;
    test.stopTest();
    list<case> allRequest = [select id
                           from case];
    Equipment_Maintenance_Item__c workPart = [select id
                                              from Equipment_Maintenance_Item__c
                                              where Maintenance_Request__c = :emptyReq.Id];
    system.assert(workPart != null);
    system.assert(allRequest.size() == 1);
}

```

```

@istest
private static void testMaintenanceRequestBulk(){
    list<Vehicle__C> vehicleList = new list<Vehicle__C>();
    list<Product2> equipmentList = new list<Product2>();
    list<Equipment_Maintenance_Item__c> workPartList = new
list<Equipment_Maintenance_Item__c>();
    list<case> requestList = new list<case>();
    list<id> oldRequestIds = new list<id>();
    for(integer i = 0; i < 300; i++){
        vehicleList.add(createVehicle());
        equipmentList.add(createEq());
    }
    insert vehicleList;
    insert equipmentList;
    for(integer i = 0; i < 300; i++){
        requestList.add(createMaintenanceRequest(vehicleList.get(i).id,
equipmentList.get(i).id));
    }
    insert requestList;
    for(integer i = 0; i < 300; i++){
        workPartList.add(createWorkPart(equipmentList.get(i).id, requestList.get(i).id));
    }
}

```

```

insert workPartList;
test.startTest();
for(case req : requestList){
    req.Status = CLOSED;
    oldRequestIds.add(req.Id);
}
update requestList;
test.stopTest();
list<case> allRequests = [select id
                        from case
                        where status =: STATUS_NEW];
list<Equipment_Maintenance_Item__c> workParts = [select id
                                                from Equipment_Maintenance_Item__c
                                                where Maintenance_Request__c in: oldRequestIds];
system.assert(allRequests.size() == 300);
}
}

```

MaintenanceRequestHelper 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,
Equipment__c, Equipment__r.Maintenance_Cycle__c,(SELECT
Id,Equipment__c,Quantity__c FROM Equipment_Maintenance_Items__r)
FROM Case WHERE Id IN :validIds]);

```

```

        Map<Id,Decimal> maintenanceCycles = new Map<ID,Decimal>();
        AggregateResult[] results = [SELECT Maintenance_Request__c,
MIN(Equipment__r.Maintenance_Cycle__c)cycle FROM
Equipment_Maintenance_Item__c WHERE Maintenance_Request__c IN :ValidIds GROUP
BY Maintenance_Request__c];
        for (AggregateResult ar : results){
            maintenanceCycles.put((Id) ar.get('Maintenance_Request__c'), (Decimal)
ar.get('cycle'));
        }
        for(Case cc : closedCasesM.values()){
            Case nc = new Case (
                ParentId = cc.Id,
                Status = 'New',
                Subject = 'Routine Maintenance',
                Type = 'Routine Maintenance',
                Vehicle__c = cc.Vehicle__c,
                Equipment__c =cc.Equipment__c,
                Origin = 'Web',
                Date_Reported__c = Date.Today()
            );
            If (maintenanceCycles.containsKey(cc.Id)){
                nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.Id));
            }
            newCases.add(nc);
        }
        insert newCases;
        List<Equipment_Maintenance_Item__c> clonedWPs = new
List<Equipment_Maintenance_Item__c>();
        for (Case nc : newCases){
            for (Equipment_Maintenance_Item__c wp :
closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items__r){
                Equipment_Maintenance_Item__c wpClone = wp.clone();
                wpClone.Maintenance_Request__c = nc.Id;
                ClonedWPs.add(wpClone);
            }
        }
    }
}

```



```

        insert ClonedWPs;
    }
}

```

MaintenanceRequest 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:

```

@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 ');
}
}
```