***SalesForce Developer Catalyst Project Document***

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**MODULE: APEX TRIGGERS**

Challenge - Get started with Apex Triggers

**AccountAddressTrigger**  
trigger AccountAddressTrigger on Account (before insert, before update) {  
 List<Account> acct = new List <Account>();  
 for(Account a: Trigger.new){  
 if( a.Match\_Billing\_Address\_\_c == true &&a.BillingPostalCode!=null ){  
 a.ShippingPostalCode = a.BillingPostalCode;  
 }  
 }  
 }

Challenge - Bulk Apex Triggers

**trigger ClosedOpportunityTrigger**

trigger ClosedOpportunityTrigger on Opportunity (after insert, after update) {

List<Task>taskList = new List<Task>();

for(Opportunity opp : Trigger.new) {

if(Trigger.isInsert) {

if(Opp.StageName == 'Closed Won') {

taskList.add(new Task(Subject = 'Follow Up Test Task', WhatId = opp.Id));

}

}

if(Trigger.isUpdate) {

if(Opp.StageName == 'Closed Won' &&Opp.StageName!=Trigger.oldMap.get(opp.Id).StageName) {

taskList.add(new Task(Subject = 'Follow Up Test Task', WhatId = opp.Id));

}

} }

if(taskList.size()>0) {

insert taskList;

}

}

**MODULE: APEX TESTING**

Challenge - Get Started with Apex Unit Tests

**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

private static Boolean DateWithin30Days(Date date1, Date date2) {

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; }

}

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**

@isTest

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);

}

}

Challenge - Test Apex Triggers

**RestrictContactByName**

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

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**

@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();

}

}

Challenge - Create Test Data for Apex Test

**RandomContactFactory class**

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;

}

}

**MODULE : ASYNCHRONOUS APEX**

Challenge - Use future methods

**AccountProcessor**

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;

}

}

**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();

}

}

Challenge - Use Batch Apex

**LeadProcessor**

global class LeadProcessor implements Database.Batchable<sObject> {

global Integer count = 0;

global Database.QueryLocator start(Database.BatchableContextbc){

return Database.getQueryLocator('SELECT ID, LeadSource FROM Lead');

}

global void execute (Database.BatchableContextbc, 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.BatchableContextbc){

system.debug('count = ' + count);

}

}

**LeadProcessorTest**

@isTest

public class LeadProcessorTest {

@isTest

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();

LeadProcessorlp = new LeadProcessor();

Id batchId = Database.executeBatch(lp);

Test.stopTest();

}

}

Challenge - Control Processes with Queueable Apex

**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;

}

}}

**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;

AddPrimaryContactaddit = 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')]);

}

}

Challenge - Schedule Jobs Using the Apex Scheduler

**DailyLeadProcessor**

global class DailyLeadProcessor implements Schedulable {

global void execute(SchedulableContextctx) {

//Retrieving the 200 first leads where lead source is in blank.

List<Lead> leads = [SELECT ID, LeadSource FROM Lead where LeadSource = '' LIMIT 200];

//Setting the LeadSource field the 'Dreamforce' value.

for (Lead lead : leads) {

lead.LeadSource = 'Dreamforce';

}

//Updating all elements in the list.

update leads;

}

}

**DailyLeadProcessorTest**

@isTest

private class DailyLeadProcessorTest {

@isTest

public static void testDailyLeadProcessor(){

//Creating new 200 Leads and inserting them.

List<Lead> leads = new List<Lead>();

for (Integer x = 0; x < 200; x++) {

leads.add(new Lead(lastname='lead number ' + x, company='company number ' + x));

}

insert leads;

//Starting test. Putting in the schedule and running the DailyLeadProcessor execute method.

Test.startTest();

String jobId = System.schedule('DailyLeadProcessor', '0 0 12 \* \* ?', new DailyLeadProcessor());

Test.stopTest();

//Once the job has finished, retrieve all modified leads.

List<Lead>listResult = [SELECT ID, LeadSource FROM Lead where LeadSource = 'Dreamforce' LIMIT 200];

//Checking if the modified leads are the same size number that we created in the start of this method.

System.assertEquals(200, listResult.size());

}

}

**MODULE: APEX INTEGRATION SERVICES**

Challenge - Apex REST Callouts

**AnimalLocator**

public class AnimalLocator{

public static String getAnimalNameById(Integer x){

Http http = new Http();

HttpRequestreq = 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**

@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**

@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;

}

}

Challenge - Apex SOAP Callouts

**ParkLocator**

public class ParkLocator {

public static string[] country(string theCountry) {

ParkService.ParksImplPortparkSvc = new ParkService.ParksImplPort(); // remove space

return parkSvc.byCountry(theCountry);

}

}

**ParkLocatorTest**

@isTest

private class ParkLocatorTest {

@isTest 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);

}

}

**ParkServiceMock**

@isTest

global class ParkServiceMock implements WebServiceMock {

global void doInvoke(

Object stub,

Object request,

Map<String, Object> response,

String endpoint,

String soapAction,

String requestName,

String responseNS,

String responseName,

String responseType) {

// start - specify the response you want to send

ParkService.byCountryResponseresponse\_x = new ParkService.byCountryResponse();

response\_x.return\_x = new List<String>{'Yellowstone', 'Mackinac National Park', 'Yosemite'};

// end

response.put('response\_x', response\_x);

}

}

Challenge - Apex Web Services

**AccountManager**

@RestResource(urlMapping='/Accounts/\*/contacts')

global class AccountManager {

@HttpGet

global static Account getAccount() {

RestRequestreq = 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**

Step 2: Automate Record Creation–

**Trigger Maintenance Request**

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

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

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

}

}

**Maintenance Request Helper**

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);

}

}

}

//When an existing maintenance request of type Repair or Routine Maintenance is closed,

//create a new maintenance request for a future routine checkup.

if (!validIds.isEmpty()){

Map<Id,Case>closedCases = 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>();

//calculate the maintenance request due dates by using the maintenance cycle defined on the related equipment records.

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 (AggregateResultar : results){

maintenanceCycles.put((Id) ar.get('Maintenance\_Request\_\_c'), (Decimal) ar.get('cycle'));

}

List<Case>newCases = new List<Case>();

for(Case cc : closedCases.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 multiple pieces of equipment are used in the maintenance request,

//define the due date by applying the shortest maintenance cycle to today’s date.

//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>clonedList = new List<Equipment\_Maintenance\_Item\_\_c>();

for (Case nc : newCases){

for (Equipment\_Maintenance\_Item\_\_cclonedListItem : closedCases.get(nc.ParentId).Equipment\_Maintenance\_Items\_\_r){

Equipment\_Maintenance\_Item\_\_c item = clonedListItem.clone();

item.Maintenance\_Request\_\_c = nc.Id;

clonedList.add(item);

}

}

insert clonedList;

}

}

}

Step 3:Synchronize Salesforce data with an External System–

**WarehouseCallOutService**

public with sharing class WarehouseCalloutService implements Queueable {

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

//Write a 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(){

System.debug('go into runWarehouseEquipmentSync');

Http http = new Http();

HttpRequest request = new HttpRequest();

request.setEndpoint(WAREHOUSE\_URL);

request.setMethod('GET');

HttpResponse response = http.send(request);

List<Product2> product2List = new List<Product2>();

System.debug(response.getStatusCode());

if (response.getStatusCode() == 200){

List<Object>jsonResponse = (List<Object>)JSON.deserializeUntyped(response.getBody());

System.debug(response.getBody());

//class maps the following fields:

//warehouse SKU will be external ID for identifying which equipment records to update within Salesforce

for (Object jR : jsonResponse){

Map<String,Object>mapJson = (Map<String,Object>)jR;

Product2 product2 = new Product2();

//replacement part (always true),

product2.Replacement\_Part\_\_c = (Boolean) mapJson.get('replacement');

//cost

product2.Cost\_\_c = (Integer) mapJson.get('cost');

//current inventory

product2.Current\_Inventory\_\_c = (Double) mapJson.get('quantity');

//lifespan

product2.Lifespan\_Months\_\_c = (Integer) mapJson.get('lifespan');

//maintenance cycle

product2.Maintenance\_Cycle\_\_c = (Integer) mapJson.get('maintenanceperiod');

//warehouse SKU

product2.Warehouse\_SKU\_\_c = (String) mapJson.get('sku');

product2.Name = (String) mapJson.get('name');

product2.ProductCode = (String) mapJson.get('\_id');

product2List.add(product2);

}

if (product2List.size() > 0){

upsert product2List;

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

}

}

}

public static void execute (QueueableContext context){

System.debug('start runWarehouseEquipmentSync');

runWarehouseEquipmentSync();

System.debug('end runWarehouseEquipmentSync');

}

}

**In Anonymous window for WarehouseCallOutService :**

System.enqueueJob(New WarehouseCalloutService());

Step 4 : Schedule Synchronization –

**WarehouseSyncSchedule**

global with sharing class WarehouseSyncSchedule implements Schedulable {

// implement scheduled code here

global void execute (SchedulableContextctx){

System.enqueueJob(new WarehouseCalloutService());

}

}

Step 5 : Test Automation Logic –

**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);

}

}

}

//When an existing maintenance request of type Repair or Routine Maintenance is closed,

//create a new maintenance request for a future routine checkup.

if (!validIds.isEmpty()){

Map<Id,Case>closedCases = 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>();

//calculate the maintenance request due dates by using the maintenance cycle defined on the related equipment records.

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 (AggregateResultar : results){

maintenanceCycles.put((Id) ar.get('Maintenance\_Request\_\_c'), (Decimal) ar.get('cycle'));

}

List<Case>newCases = new List<Case>();

for(Case cc : closedCases.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 multiple pieces of equipment are used in the maintenance request,

//define the due date by applying the shortest maintenance cycle to today’s date.

//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>clonedList = new List<Equipment\_Maintenance\_Item\_\_c>();

for (Case nc : newCases){

for (Equipment\_Maintenance\_Item\_\_cclonedListItem : closedCases.get(nc.ParentId).Equipment\_Maintenance\_Items\_\_r){

Equipment\_Maintenance\_Item\_\_c item = clonedListItem.clone();

item.Maintenance\_Request\_\_c = nc.Id;

clonedList.add(item);

}

}

insert clonedList;

}

}

}

**MaintenanceRequestHelperTest**

@isTest

public with sharing class MaintenanceRequestHelperTest{

// createVehicle

private static Vehicle\_\_ccreateVehicle(){

Vehicle\_\_c vehicle = new Vehicle\_\_C(name = 'Testing Vehicle');

return vehicle;

}

// createEquipment

private static Product2 createEquipment(){

product2 equipment = new product2(name = 'Testing equipment',

lifespan\_months\_\_c = 10,

maintenance\_cycle\_\_c = 10,

replacement\_part\_\_c = true);

return equipment;

}

// createMaintenanceRequest

private static Case createMaintenanceRequest(id vehicleId, id equipmentId){

case cse = new case(Type='Repair',

Status='New',

Origin='Web',

Subject='Testing subject',

Equipment\_\_c=equipmentId,

Vehicle\_\_c=vehicleId);

return cse;

}

// createEquipmentMaintenanceItem

private static Equipment\_Maintenance\_Item\_\_ccreateEquipmentMaintenanceItem(id equipmentId,idrequestId){

Equipment\_Maintenance\_Item\_\_cequipmentMaintenanceItem = new Equipment\_Maintenance\_Item\_\_c(

Equipment\_\_c = equipmentId,

Maintenance\_Request\_\_c = requestId);

return equipmentMaintenanceItem;

}

@isTest

private static void testPositive(){

Vehicle\_\_c vehicle = createVehicle();

insert vehicle;

id vehicleId = vehicle.Id;

Product2 equipment = createEquipment();

insert equipment;

id equipmentId = equipment.Id;

case createdCase = createMaintenanceRequest(vehicleId,equipmentId);

insert createdCase;

Equipment\_Maintenance\_Item\_\_cequipmentMaintenanceItem = createEquipmentMaintenanceItem(equipmentId,createdCase.id);

insert equipmentMaintenanceItem;

test.startTest();

createdCase.status = 'Closed';

update createdCase;

test.stopTest();

Case newCase = [Select id, subject,

type,

Equipment\_\_c,

Date\_Reported\_\_c,

Vehicle\_\_c,

Date\_Due\_\_c

from case

where status ='New'];

Equipment\_Maintenance\_Item\_\_cworkPart = [select id

from Equipment\_Maintenance\_Item\_\_c

where Maintenance\_Request\_\_c =:newCase.Id];

list<case>allCase = [select id from case];

system.assert(allCase.size() == 2);

system.assert(newCase != null);

system.assert(newCase.Subject != null);

system.assertEquals(newCase.Type, 'Routine Maintenance');

SYSTEM.assertEquals(newCase.Equipment\_\_c, equipmentId);

SYSTEM.assertEquals(newCase.Vehicle\_\_c, vehicleId);

SYSTEM.assertEquals(newCase.Date\_Reported\_\_c, system.today());

}

@isTest

private static void testNegative(){

Vehicle\_\_C vehicle = createVehicle();

insert vehicle;

id vehicleId = vehicle.Id;

product2 equipment = createEquipment();

insert equipment;

id equipmentId = equipment.Id;

case createdCase = createMaintenanceRequest(vehicleId,equipmentId);

insert createdCase;

Equipment\_Maintenance\_Item\_\_cworkP = createEquipmentMaintenanceItem(equipmentId, createdCase.Id);

insert workP;

test.startTest();

createdCase.Status = 'Working';

update createdCase;

test.stopTest();

list<case>allCase = [select id from case];

Equipment\_Maintenance\_Item\_\_cequipmentMaintenanceItem = [select id

from Equipment\_Maintenance\_Item\_\_c

where Maintenance\_Request\_\_c = :createdCase.Id];

system.assert(equipmentMaintenanceItem != null);

system.assert(allCase.size() == 1);

}

@isTest

private static void testBulk(){

list<Vehicle\_\_C>vehicleList = new list<Vehicle\_\_C>();

list<Product2>equipmentList = new list<Product2>();

list<Equipment\_Maintenance\_Item\_\_c>equipmentMaintenanceItemList = new list<Equipment\_Maintenance\_Item\_\_c>();

list<case>caseList = new list<case>();

list<id>oldCaseIds = new list<id>();

for(integer i = 0; i< 300; i++){

vehicleList.add(createVehicle());

equipmentList.add(createEquipment());

}

insert vehicleList;

insert equipmentList;

for(integer i = 0; i< 300; i++){

caseList.add(createMaintenanceRequest(vehicleList.get(i).id, equipmentList.get(i).id));

}

insert caseList;

for(integer i = 0; i< 300; i++){

equipmentMaintenanceItemList.add(createEquipmentMaintenanceItem(equipmentList.get(i).id, caseList.get(i).id));

}

insert equipmentMaintenanceItemList;

test.startTest();

for(case cs : caseList){

cs.Status = 'Closed';

oldCaseIds.add(cs.Id);

}

update caseList;

test.stopTest();

list<case>newCase = [select id

from case

where status ='New'];

list<Equipment\_Maintenance\_Item\_\_c>workParts = [select id

from Equipment\_Maintenance\_Item\_\_c

where Maintenance\_Request\_\_c in: oldCaseIds];

system.assert(newCase.size() == 300);

list<case>allCase = [select id from case];

system.assert(allCase.size() == 600);

}}

**Trigger MaintenanceRequest**

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

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

MaintenanceRequestHelper.updateWorkOrders(Trigger.New

, Trigger.OldMap);

}

}

Step 6 : Test Callout Logic –

**WarehouseCallOutService**

public with sharing class WarehouseCalloutService implements Queueable {

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

//Write a 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(){

System.debug('go into runWarehouseEquipmentSync');

Http http = new Http();

HttpRequest request = new HttpRequest();

request.setEndpoint(WAREHOUSE\_URL);

request.setMethod('GET');

HttpResponse response = http.send(request);

List<Product2> product2List = new List<Product2>();

System.debug(response.getStatusCode());

if (response.getStatusCode() == 200){

List<Object>jsonResponse = (List<Object>)JSON.deserializeUntyped(response.getBody());

System.debug(response.getBody());

//class maps the following fields:

//warehouse SKU will be external ID for identifying which equipment records to update within Salesforce

for (Object jR : jsonResponse){

Map<String,Object>mapJson = (Map<String,Object>)jR;

Product2 product2 = new Product2();

//replacement part (always true),

product2.Replacement\_Part\_\_c = (Boolean) mapJson.get('replacement');

//cost

product2.Cost\_\_c = (Integer) mapJson.get('cost');

//current inventory

product2.Current\_Inventory\_\_c = (Double) mapJson.get('quantity');

//lifespan

product2.Lifespan\_Months\_\_c = (Integer) mapJson.get('lifespan');

//maintenance cycle

product2.Maintenance\_Cycle\_\_c = (Integer) mapJson.get('maintenanceperiod');

//warehouse SKU

product2.Warehouse\_SKU\_\_c = (String) mapJson.get('sku');

product2.Name = (String) mapJson.get('name');

product2.ProductCode = (String) mapJson.get('\_id');

product2List.add(product2);

}

if (product2List.size() > 0){

upsert product2List;

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

}

}

}

public static void execute (QueueableContext context){

System.debug('start runWarehouseEquipmentSync');

runWarehouseEquipmentSync();

System.debug('end runWarehouseEquipmentSync');

}

}

**WarehouseCallOutServiceTest**

@IsTest

private class WarehouseCalloutServiceTest {

// implement your mock callout test here

@isTest

static void testWarehouseCallout() {

test.startTest();

test.setMock(HttpCalloutMock.class, new WarehouseCalloutServiceMock());

WarehouseCalloutService.execute(null);

test.stopTest();

List<Product2> product2List = new List<Product2>();

product2List = [SELECT ProductCode FROM Product2];

System.assertEquals(3, product2List.size());

System.assertEquals('55d66226726b611100aaf741', product2List.get(0).ProductCode);

System.assertEquals('55d66226726b611100aaf742', product2List.get(1).ProductCode);

System.assertEquals('55d66226726b611100aaf743', product2List.get(2).ProductCode);

}

}

**WarehouseCalloutServiceMock**

@isTest

global class WarehouseCalloutServiceMock implements HttpCalloutMock {

// implement http mock callout

global static HttpResponse respond(HttpRequest request) {

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"},{"\_id":"55d66226726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"\_id":"55d66226726b611100aaf743","replacement":true,"quantity":143,"name":"Fuse 20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');

response.setStatusCode(200);

return response;

}

}

Step 7 : Test Scheduling Logic –

**WarehouseSyncScheduleTest**

@isTest

public with sharing class WarehouseSyncScheduleTest {

@isTest static void test() {

String scheduleTime = '00 00 00 \* \* ? \*';

Test.startTest();

Test.setMock(HttpCalloutMock.class, new WarehouseCalloutServiceMock());

String jobId = System.schedule('Warehouse Time to Schedule to test', scheduleTime, new WarehouseSyncSchedule());

CronTrigger c = [SELECT State FROM CronTrigger WHERE Id =: jobId];

System.assertEquals('WAITING', String.valueOf(c.State), 'JobId does not match');

Test.stopTest();

}

}

**WarehouseSyncSchedule**

global with sharing class WarehouseSyncSchedule implements Schedulable {

// implement scheduled code here

global void execute (SchedulableContextctx){

System.enqueueJob(new WarehouseCalloutService());

}

}

**WarehouseCalloutServiceMock**

@isTest

global class WarehouseCalloutServiceMock implements HttpCalloutMock {

// implement http mock callout

global static HttpResponse respond(HttpRequest request) {

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"},{"\_id":"55d66226726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"\_id":"55d66226726b611100aaf743","replacement":true,"quantity":143,"name":"Fuse 20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');

response.setStatusCode(200);

return response;

}

}