SALESFORCE DEVELOPER CATALYST

Apex Triggers:

1.Get Started With Apex Triggers:

AccountAddressTrigger

trigger AccountAddressTrigger on Account (before insert,before update) {

for (Account account:Trigger.new){

if(account.Match\_Billing\_Address\_\_c == True){

account.ShippingPostalCode = account.BillingPostalCode;

}

}

}

2.Bulk Apex Triggers:

ClosedOpportunityTrigger

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

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

for(Opportunity opp : Trigger.New){

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

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

}

}

if(taskList.size()>0){

insert taskList;

}

}

Apex Testing:

1.Get Started With Apex Unit Tests:

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) {

//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

@isTest

public class TestVerifyDate {

@isTest static void Test\_CheckDates\_case1(){

Date D = VerifyDate.CheckDates(date.parse('01/01/2020'), date.parse('01/05/2020'));

System.assertEquals(date.parse('01/05/2020'), D);

}

@isTest static void Test\_CheckDates\_case2(){

Date D = VerifyDate.CheckDates(date.parse('01/01/2020'), date.parse('05/05/2020'));

System.assertEquals(date.parse('01/31/2020'), D);

}

@isTest static void Test\_DateWithin30Days\_case1(){

Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'), date.parse('12/30/2019'));

System.assertEquals(false, flag);

}

@isTest static void Test\_DateWithin30Days\_case2(){

Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'), date.parse('02/02/2020'));

System.assertEquals(false, flag);

}

@isTest static void Test\_DateWithin30Days\_case3(){

Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2020'), date.parse('01/15/2020'));

System.assertEquals(false, flag);

}

@isTest static void Test\_SetEndOfMonthDate(){

Date returndate = VerifyDate.SetEndOfMonthDate(date.parse('01/01/2020'));

}

}

2.Test Apex Triggers:

RestrictContactByName

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

//check contacts prior to insert or update for invalid data

For (Contact c : Trigger.New) {

if(c.LastName == 'INVALIDNAME') { //invalidname is invalid

c.AddError('The Last Name "'+c.LastName+'" is not allowed for DML');

}}}

TestRestrictContactByName

@isTest

public class TestRestrictContactByName {

@isTest static void Test\_insertupdateContact(){

Contact cnt = new Contact();

cnt.LastName = 'INVALIDNAME';

Test.startTest();

Database.SaveResult result = Database.insert(cnt, false);

Test.stopTest();

System.assert(!result.isSuccess());

System.assert(result.getErrors().size() > 0);

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

}}

3**.**Create Test Data for Apex Tests:

RandomContactFactory

public class RandomContactFactory {

public static List<Contact> generateRandomContacts(Integer numcnt, string lastname){

List<Contact> contacts = new List<Contact>();

for(Integer i=0;i<numcnt;i++){

Contact cnt = new Contact(FirstName = 'Test'+i, LastName = lastname);

contacts.add(cnt);

}

return contacts;

}

}

Asynchronous Apex:

2.Use Future Methods:

AccountProcessor

public class AccountProcessor {

@future

public static void countContacts(List<Id> accountIds){

List<Account> accountsToUpdate = new List<Account>();

List<Account> accounts = [Select Id, Name, (Select Id from Contacts) from Account Where Id in :accountIds];

For(Account acc:accounts){

List<Contact> contactList = acc.Contacts;

acc.Number\_Of\_Contacts\_\_c = contactList.size();

accountsToUpdate.add(acc);

}

update accountsToUpdate;

}

}

AccountProcessorTest

@IsTest

private class AccountProcessorTest {

@IsTest

private static void testcountContacts(){

Account newAccount = new Account(Name='Test Account');

insert newAccount;

Contact newContact1 = new Contact(FirstName='John',LastName='Doe',AccountId = newAccount.Id);

insert newContact1;

Contact newContact2 = new Contact(FirstName='Jane',LastName='Doe',AccountId = newAccount.Id);

insert newContact2;

List<Id> accountIds = new List<Id>();

accountIds.add(newAccount.Id);

Test.startTest();

AccountProcessor.countContacts(accountIds);

Test.stopTest();

}

}

3.Use Batch Apex:

LeadProcessor

global class LeadProcessor implements Database.Batchable<sObject> {

global Integer count = 0;

global Database.QueryLocator start(Database.BatchableContext bc){

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

}

global void execute (Database.BatchableContext bc, List<Lead> L\_list){

List<lead> L\_list\_new = new List<lead>();

for(lead L:L\_list){

L.leadsource = 'Dreamforce';

L\_list\_new.add(L);

count +=1;

}

update L\_list\_new;

}

global void finish(Database.BatchableContext bc){

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

}

}

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();

LeadProcessor lp = new LeadProcessor();

Id batchId = Database.executeBatch(lp);

Test.stopTest();

}

}

4.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<500;i++){

testAccounts.add(new Account(Name = 'Account'+i,Billingstate='CA'));

}

for(Integer j=0;j<50;j++){

testAccounts.add(new Account(Name='Account '+j,BillingState='NY'));

}

insert testAccounts;

Contact testContact = new Contact(FirstName ='John',LastName ='Doe');

insert testContact;

AddPrimaryContact addit = new addPrimaryContact(testContact,'CA');

Test.startTest();

system.enqueueJob(addit);

Test.stopTest();

System.assertEquals(50,[Select count() from Contact where accountId in (Select Id from Account where BillingState='CA')]);

}

5.Schedule Jods Using The Apex Scheduler:

DailyLeadProcessor

global class DailyLeadProcessor implements Schedulable{

global void execute(SchedulableContext ctx){

List<lead> leadstoupdate = new List<lead>();

List<Lead> leads = [Select id from Lead Where LeadSource = NULL Limit 200];

for(Lead l:leads){

l.LeadSource = 'Dreamforce';

leadstoupdate.add(l);

}

update leadstoupdate;

}

}

DailyLeadProcessorTest

@isTest

private class DailyLeadProcessorTest {

public static String CRON\_EXP = '0 0 0 15 7 ? 2022';

static testmethod void testScheduledJob(){

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

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

Lead l = new Lead(

FirstName = 'First '+i,

LastName = 'LastName',

Company = 'The Inc'

);

leads.add(l);

}

insert leads;

Test.startTest();

String jobId = System.schedule('ScheduledApexTest', CRON\_EXP, new DailyLeadProcessor());

Test.stopTest();

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

checkleads = [Select Id From Lead Where LeadSource = 'Dreamforce' and Company = 'The Inc'];

System.assertEquals(200, checkleads.size(),'Leads were not created');

}

}

Apex Integration Services:

2. Apex Rest Callouts:

AnimalLocator

public class AnimalLocator {

public static String getAnimalNameById(Integer animalId) {

String animalName;

Http http = new Http();

HttpRequest request = new HttpRequest();

request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/'+animalId);

request.setMethod('GET');

HttpResponse response = http.send(request);

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

Map<String, Object> r = (Map<String, Object>)

JSON.deserializeUntyped(response.getBody());

Map<String, Object> animal= (Map<String, Object>)r.get('animal');

animalName = string.valueOf(animal.get('name'));

}

return animalName;

}

}

AnimalLocatorTest

@isTest

private class AnimalLocatorTest {

@isTest static void getAnimalNameByIdTest() {

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

string response = AnimalLocator.getAnimalNameById(1);

System.assertEquals('chicken', response);

}

}

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('{"animal":{"id":1,"name":"chicken","eats":"chicken food","says":"cluck cluck"}}');

response.setStatusCode(200);

return response;

}

}

3. Apex SOAP Callouts:

ParkLocator

public class ParkLocator {

public static List<String> country(String country) {

ParkService.ParksImplPort parkservice =

new parkService.ParksImplPort();

return parkservice.byCountry(country);

}

}

ParkLocatorTest

@isTest

private class ParkLocatorTest {

@isTest static void testCallout() {

// This causes a fake response to be generated

Test.setMock(WebServiceMock.class, new ParkServiceMock());

// Call the method that invokes a callout

String country = 'United States';

List<String> result = ParkLocator.country(country);

List<String> parks = new List<String>();

parks.add('Yosemite');

parks.add('Yellowstone');

parks.add('Another Park');

// Verify that a fake result is returned

System.assertEquals(parks, result);

}

}

ParkLocatorMock

@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

List<String> parks = new List<string>();

parks.add('Yosemite');

parks.add('Yellowstone');

parks.add('Another Park');

ParkService.byCountryResponse response\_x =

new ParkService.byCountryResponse();

response\_x.return\_x = parks;

// end

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

}

}

ParkService

//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;

}

}

}

4. Apex Web Servcies:

AccountManager

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

global with sharing class AccountManager {

@HttpGet

global static Account getAccount(){

RestRequest request = RestContext.request;

String accountId = request.requestURI.substringBetween('Accounts/','/contacts');

Account result = [SELECT Id, Name, (Select Id, Name from Contacts) from Account where Id=:accountId Limit 1];

return result;

}

}

AccountManagerTest

@IsTest

private class AccountManagerTest {

@isTest static void testGetContactsByAccountId(){

Id recordId = createTestRecord();

RestRequest request = new RestRequest();

request.requestUri = 'https://yourInstance.my.salesforce.com/services/apexrest/Accounts/'

+ recordId+'/contacts';

request.httpMethod = 'GET';

RestContext.request = request;

Account thisAccount = AccountManager.getAccount();

System.assert(thisAccount != null);

System.assertEquals('Test record', thisAccount.Name);

}

static Id createTestRecord(){

Account accountTest = new Account(

Name ='Test record');

insert accountTest;

Contact contactTest = new Contact(

FirstName='John',

LastName='Doe',

AccountId=accountTest.Id

);

insert contactTest;

return accountTest.Id;

}

}

Apex Specialist SuperBadge:

2.Automates Record Creation:

MaintenanceRequest

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

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

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

}

}

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 (AggregateResult ar : 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\_\_c clonedListItem : 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;

}

}

}

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';

// system to get a list of equipment that needs to be updated.

@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());

for (Object jR : jsonResponse){

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

Product2 product2 = new Product2();

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

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

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

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

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

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');

}

}

4.Schedule synchronization using Apex code:

WarehouseSyncSchedule

global with sharing class WarehouseSyncSchedule implements Schedulable{

global void execute(SchedulableContext ctx){

System.enqueueJob(new WarehouseCalloutService());

}

}

5.Test Automation Logic:

MaintenanceRequestHelperTest

@isTest

public with sharing class MaintenanceRequestHelperTest {

// createVehicle

private static Vehicle\_\_c createVehicle(){

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\_\_c createEquipmentMaintenanceItem(id equipmentId,id requestId){

Equipment\_Maintenance\_Item\_\_c equipmentMaintenanceItem = 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\_\_c equipmentMaintenanceItem = 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\_\_c workPart = [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\_\_c workP = 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\_\_c equipmentMaintenanceItem = [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);

}

}

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 (AggregateResult ar : 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\_\_c clonedListItem : 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;

}

}

}

MaintenanceRequest

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

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

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

}

}

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;

}

}

7.Test Scheduling Logic:

WarehouseSyncSchedule

global with sharing class WarehouseSyncSchedule implements Schedulable{

global void execute(SchedulableContext ctx){

System.enqueueJob(new WarehouseCalloutService());

}

}

WarehouseSyncScheduleTest

@isTest

public with sharing class WarehouseSyncScheduleTest {

// implement scheduled code here

//

@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();

}

}