

APEX SPECIALIST SUPER BADGE CODES

APEX TRIGGERS

AccountAddressTrigger.axpt:

```
trigger AccountAddressTrigger on Account (before insert,before update) {  
    for(Account account:Trigger.New){  
        if(account.Match_Billing_Address__c == True){  
            account.ShippingPostalCode = account.BillingPostalCode;  
        }  
    }  
}
```

ClosedOpportunityTrigger.axpt:

```
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

VerifyData.apxc:

```
public class VerifyDate {  
    public static Date CheckDates(Date date1, Date date2) {  
        if(DateWithin30Days(date1,date2)) {  
            return date2;  
        } else {  
            return SetEndOfMonthDate(date1);  
        }  
    }  
    @TestVisible private static Boolean DateWithin30Days(Date date1, Date date2) {  
        //check for date2 being in the past  
        if( date2 < date1) { return false; }  
    }  
}
```

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```
//check that date2 is within (>=) 30 days of date1
Date date30Days = date1.addDays(30); //create a date 30 days away from date1
    if( date2 >= date30Days ) { return false; }
    else { return true; }
}
```

```
//method to return the end of the month of a given date
@TestVisible private static Date SetEndOfMonthDate(Date date1) {
    Integer totalDays = Date.daysInMonth(date1.year(), date1.month());
    Date lastDay = Date.newInstance(date1.year(), date1.month(), totalDays);
    return lastDay;
}
```

```
}
```

TestVerifyData.apxc:

```
@isTest
private class TestVerifyDate {
    @isTest static void Test_CheckDates_case1(){
        Date D = VerifyDate.CheckDates(date.parse('01/01/2022'),date.parse('01/05/2022'));
        System.assertEquals(date.parse('01/05/2022'), D);
    }
    @isTest static void Test_CheckDates_case2(){
        Date D = VerifyDate.CheckDates(date.parse('01/01/2022'), date.parse('05/05/2022'));
        System.assertEquals(date.parse('01/31/2022'), D);
    }
    @isTest static void Test_Within30Days_case1(){
        Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2022'),
date.parse('12/30/2021'));
        System.assertEquals(false, flag);
    }
    @isTest static void Test_Within30Days_case2(){
        Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2022'),
date.parse('02/02/2021'));
        System.assertEquals(false, flag);
    }
    @isTest static void Test_Within30Days_case3(){
```

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```
Boolean flag = VerifyDate.DateWithin30Days(date.parse('01/01/2022'),
date.parse('01/15/2022'));
System.assertEquals(true, flag);
}
@isTest static void Test_SetEndOfMonthDate(){
    Date returndate = VerifyDate.SetEndOfMonthDate(date.parse('01/01/2022'));
}
}
```

RestrictContactByName.apxt:

```
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.apxc:

```
@isTest
private 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());
    }
}
```

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RandomContactFactory.apxc:

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

ASYNCHRONOUS APEX

AccountProcessor.apxc:

```
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.apxc:

```
@isTest
public 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 =
```

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```
newAccount.Id);
    insert newContact1;

    Contact newContact2 = new Contact(FirstName = 'John',LastName = 'Doe',AccountId =
newAccount.Id);
    insert newContact2;
    List<Id> accountIds = new List<Id>();
    accountIds.add(newAccount.Id);
    Test.startTest();
    AccountProcessor.countContacts(accountIds);
    Test.stopTest();
}
}
```

LeadProcessor.apxc:

```
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.apxc:

```
@isTest
public class LeadProcessorTest {
    @isTest
    public static void testit() {
```

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```
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();
}
}
```

AddPrimaryContact.apxc:

```
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;
        }
    }
}
```

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AddPrimaryContactTest.apxc:

```
@isTest
public class AddPrimaryContactTest {
    static testmethod void testQueueable() {
        List<Account> testAccounts = new List<Account>();
        for(Integer i = 0; i < 50; i++) {
            testAccounts.add(new Account (Name = 'Account' + i,BillingState = 'CA'));
        }
        for(Integer j = 0; j < 50; j++) {
            testAccounts.add(new Account(Name = 'Account'+ j, BillingState = 'NY'));
        }
        insert testAccounts;
        Contact testContact = new Contact(FirstName = 'John', LastName = 'Doe');
        insert testContact;
        AddPrimaryContact addit = new AddPrimaryContact(testContact,'CA');
        Test.startTest();
        system.enqueueJob(addit);
        Test.stopTest();
        System.assertEquals(50, [Select count() from Contact where accountId in (Select Id from
Account where BillingState = 'CA')]);
    }
}
```

DailyLeadProcessor.apxc:

```
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;
    }
}
```

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DailyLeadProcessorTest.apxc:

```
@isTest
private class DailyLeadProcessorTest {
    public static String CRON_EXP = '0 0 0 15 3 ? 2024';
    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

AnimalLocator.apxc:

```
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) {
```


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```
    Map<String, Object> results = (Map<String, Object>)JSON.deserializeUntyped(res.getBody());
    animal = (Map<String, Object>) results.get('animal');
}
return (String)animal.get('name');
}
}
```

AnimalLocatorTest.apxc:

```
@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.apxc:

```
@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;
    }
}
```

ParkLocator.apxc:

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

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ParkLocatorTest.apxc:

```
@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.apxc:

```
@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);
    }
}
```

AccountManager.apxc:

```
@RestResource(urlMapping='/Accounts/*/contacts')
global class AccountManager {
    @HttpGet
    global static Account getAccount() {
        RestRequest req = RestContext.request;
        String accId = req.requestURI.substringBetween('Accounts/', '/contacts');
```

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```
Account acc = [SELECT Id, Name, (SELECT Id, Name FROM Contacts)
               FROM Account WHERE Id = :accId];
return acc;
}
}
```

AccountManagerTest.apxc:

```
@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;
    }
}
```

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Challenge-1

MaintenanceRequestHelper.apxc:

```
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',
```

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```
        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;
}
}
```

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MaintenanceRequest.apxt:

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

MaintenanceRequestHelperTest.apxc:

```
@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,
```

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```
        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];
```

[illegible]

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```
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;
```

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```
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);
}
}
```

Challenge-2

WarehouseCalloutService.apxc:

```
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());
```

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```
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();
}

}
```

WarehouseCalloutServiceMock.apxc:

```
@isTest
global class WarehouseCalloutServiceMock implements HttpCalloutMock {
    // implement http mock callout
    global static HttpResponse respond(HttpRequest request) {
```

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```
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;
}
}
```

WarehouseCalloutServiceTest.apxc:

```
@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);
    }
}
```

Challenge-3

WarehouseSyncSchedule.apxc:

```
global with sharing class WarehouseSyncSchedule implements Schedulable{
```

APEX SPECIALIST SUPER BADGE CODES

```
global void execute(SchedulableContext ctx){  
    System.enqueueJob(new WarehouseCalloutService());  
}  
}
```

WarehouseSyncScheduleTest.apxc:

```
@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 ');  
  
    }  
}
```

Challenge-4

MaintenanceRequestHelperTest.apxc:

```
@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(){
```

APEX SPECIALIST SUPER BADGE CODES

```
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;
```

APEX SPECIALIST SUPER BADGE CODES

```
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;
```

APEX SPECIALIST SUPER BADGE CODES

```
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;
```


APEX SPECIALIST SUPER BADGE CODES

```
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.apxc:

```
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'){
```

APEX SPECIALIST SUPER BADGE CODES

```
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));
```

APEX SPECIALIST SUPER BADGE CODES

```
    }

    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;
}
}
```

Challenge-5

WarehouseCalloutService.apxc:

```
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);
```

APEX SPECIALIST SUPER BADGE CODES

```
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();  
}
```

APEX SPECIALIST SUPER BADGE CODES

```
}  
  
    WarehouseCalloutServiceMock.apxc:  
  
@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":"Gene  
rator 1000  
kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"},{"_id":"55d66226726b611100a  
af742","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;  
    }  
}
```

```
    WarehouseCalloutServiceTest.apxc:  
  
@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":"Gene  
rator 1000  
kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"},{"_id":"55d66226726b611100a  
af742","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"}]');  
    }
```

APEX SPECIALIST SUPER BADGE CODES

```
response.setStatusCode(200);

return response;
}
}
```

Challenge-6

WarehouseSyncSchedule.apxc:

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

WarehouseSyncScheduleTest.apxc:

```
@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 ');

    }
}
```