

## APEX SPECIALIST SUPERBADGE-SOLUTIONS

### Automated Record Creation

#### 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',
```

```

Subject = 'Routine Maintenance',
Type = 'Routine Maintenance',
Vehicle__c = cc.Vehicle__c,
Equipment__c =cc.Equipment__c,
Origin = 'Web',
Date_Reported__c = Date.Today()
);
If (maintenanceCycles.containskey(cc.Id)){
nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.Id));
} else {
nc.Date_Due__c = Date.today().addDays((Integer)
cc.Equipment__r.maintenance_Cycle__c);
}
newCases.add(nc);
}
insert newCases;
List<Equipment_Maintenance_Item__c> clonedWPs = new
List<Equipment_Maintenance_Item__c>();
for (Case nc : newCases){
for (Equipment_Maintenance_Item__c wp :
closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items__r){
Equipment_Maintenance_Item__c wpClone = wp.clone();
wpClone.Maintenance_Request__c = nc.Id;
ClonedWPs.add(wpClone);
}
}
insert ClonedWPs;
}
}
}

```

MaintenanceRequest.apxt

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

Synchronize Salesforce data with an external system

WarehouseCalloutService.apxc :-

```
public with sharing class WarehouseCalloutService implements Queueable {  
    private static final String WAREHOUSE_URL =  
        'https://thsuperbadgeapex.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 qqfesc80rqna4ljmv0ga2m5m6f58twm7nqc27h0gx2(){  
        Http http = new Http();  
        HttpRequest request = new HttpRequest();  
        request.setEndpoint(WAREHOUSE_URL);  
        request.setMethod('GET');  
        HttpResponse response = http.send(request);  
        List<Product2> warehouseEq = new List<Product2>();  
        if (response.getStatusCode() == 200){  
            List<Object> jsonResponse =  
                (List<Object>)JSON.deserializeUntyped(response.getBody());  
            System.debug(response.getBody());  
            //class maps the following fields: replacement part (always true), cost, current  
            //inventory, lifespan, maintenance cycle, and warehouse SKU  
            //warehouse SKU will be external ID for identifying which equipment records  
            //to update within Salesforce  
            for (Object eq : jsonResponse){
```

```

Map<String,Object> mapJson = (Map<String,Object>)eq;
Product2 myEq = new Product2();
myEq.Replacement_Part__c = (Boolean) mapJson.get('replacement');
myEq.Name = (String) mapJson.get('name');
myEq.Maintenance_Cycle__c = (Integer)
mapJson.get('maintenanceperiod');
myEq.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
myEq.Cost__c = (Integer) mapJson.get('cost');
myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
myEq.ProductCode = (String) mapJson.get('_id');
warehouseEq.add(myEq);
}
if (warehouseEq.size() > 0){
upsert warehouseEq;
System.debug('Your equipment was synced with the warehouse one');
}
}
}
public static void execute (QueueableContext context){
qqfesc80rqna4lrmv0ga2m5m6f58twm7nqc27h0gx2();
}
}

```

After saving the code open execute anonymous window ( CTRL+E ) and run this method ,

```

System.enqueueJob(new WarehouseCalloutService());

```

Schedule synchronization using Apex code

WarehouseSyncSchedule.apxc :-

```

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

```

Test automation logic

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,
        Vehicle__c=vehicleId);
        return cs;
    }
}
```

```

PRIVATE STATIC Equipment_Maintenance_Item__c createWorkPart(id
equipmentId,id requestId){
Equipment_Maintenance_Item__c wp = new
Equipment_Maintenance_Item__c(Equipment__c = equipmentId,
Maintenance_Request__c = requestId);
return wp;
}

```

```

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

```

```
SYSTEM.assertEquals(newReq.Vehicle__c, vehicleId);
SYSTEM.assertEquals(newReq.Date_Reported__c, system.today());
}
```

```
@istest
private static void testMaintenanceRequestNegative(){
    Vehicle__C vehicle = createVehicle();
    insert vehicle;
    id vehicleId = vehicle.Id;
    product2 equipment = createEq();
    insert equipment;
    id equipmentId = equipment.Id;
    case emptyReq = createMaintenanceRequest(vehicleId,equipmentId);
    insert emptyReq;
    Equipment_Maintenance_Item__c workP = createWorkPart(equipmentId,
emptyReq.Id);
    insert workP;
    test.startTest();
    emptyReq.Status = WORKING;
    update emptyReq;
    test.stopTest();
    list<case> allRequest = [select id
from case];
    Equipment_Maintenance_Item__c workPart = [select id
from Equipment_Maintenance_Item__c
where Maintenance_Request__c = :emptyReq.Id];
    system.assert(workPart != null);
    system.assert(allRequest.size() == 1);
}
```

```
@istest
private static void testMaintenanceRequestBulk(){
    list<Vehicle__C> vehicleList = new list<Vehicle__C>();
    list<Product2> equipmentList = new list<Product2>();
    list<Equipment_Maintenance_Item__c> workPartList = new
```

```

list<Equipment_Maintenance_Item__c>();
list<case> requestList = new list<case>();
list<id> oldRequestIds = new list<id>();
for(integer i = 0; i < 300; i++){
    vehicleList.add(createVehicle());
    equipmentList.add(createEq());
}
insert vehicleList;
insert equipmentList;
for(integer i = 0; i < 300; i++){
    requestList.add(createMaintenanceRequest(vehicleList.get(i).id,
    equipmentList.get(i).id));
}
insert requestList;
for(integer i = 0; i < 300; i++){
    workPartList.add(createWorkPart(equipmentList.get(i).id,
    requestList.get(i).id));
}
insert workPartList;
test.startTest();
for(case req : requestList){
    req.Status = CLOSED;
    oldRequestIds.add(req.Id);
}
update requestList;
test.stopTest();
list<case> allRequests = [select id
from case
where status =: STATUS_NEW];
list<Equipment_Maintenance_Item__c> workParts = [select id
from Equipment_Maintenance_Item__c
where Maintenance_Request__c in: oldRequestIds];
system.assert(allRequests.size() == 300);
}
}

```



MaintenanceRequestHelper.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',
                Subject = 'Routine Maintenance',
                Type = 'Routine Maintenance',
                Vehicle__c = cc.Vehicle__c,
                Equipment__c =cc.Equipment__c,
```

```

Origin = 'Web',
Date_Reported__c = Date.Today()
);
If (maintenanceCycles.containsKey(cc.Id)){
nc.Date_Due__c = Date.today().addDays((Integer)
maintenanceCycles.get(cc.Id));
}
newCases.add(nc);
}
insert newCases;
List<Equipment_Maintenance_Item__c> clonedWPs = new
List<Equipment_Maintenance_Item__c>();
for (Case nc : newCases){
for (Equipment_Maintenance_Item__c wp :
closedCasesM.get(nc.ParentId).Equipment_Maintenance_Items__r){
Equipment_Maintenance_Item__c wpClone = wp.clone();
wpClone.Maintenance_Request__c = nc.Id;
ClonedWPs.add(wpClone);
}
}
insert ClonedWPs;
}
}
}

```

MaintenanceRequest.apxt :-

```

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

```

Test callout logic

WarehouseCalloutService.apxc :-

```
public with sharing class WarehouseCalloutService {
    private static final String WAREHOUSE_URL =
    'https://thsuperbadgeapex.herokuapp.com/equipment';
    //@future(callout=true)
    public static void qqfesc80rqna4ljmv0ga2m5m6f58twm7nqc27h0gx2(){
        Http http = new Http();
        HttpRequest request = new HttpRequest();
        request.setEndpoint(WAREHOUSE_URL);
        request.setMethod('GET');
        HttpResponse response = http.send(request);
        List<Product2> warehouseEq = new List<Product2>();
        if (response.getStatusCode() == 200){
            List<Object> jsonResponse =
            (List<Object>)JSON.deserializeUntyped(response.getBody());
            System.debug(response.getBody());
            for (Object eq : jsonResponse){
                Map<String,Object> mapJson = (Map<String,Object>)eq;
                Product2 myEq = new Product2();
                myEq.Replacement_Part__c = (Boolean) mapJson.get('replacement');
                myEq.Name = (String) mapJson.get('name');
                myEq.Maintenance_Cycle__c = (Integer) mapJson.get('maintenanceperiod');
                myEq.Lifespan_Months__c = (Integer) mapJson.get('lifespan');
                myEq.Cost__c = (Decimal) mapJson.get('lifespan');
                myEq.Warehouse_SKU__c = (String) mapJson.get('sku');
                myEq.Current_Inventory__c = (Double) mapJson.get('quantity');
                warehouseEq.add(myEq);
            }
            if (warehouseEq.size() > 0){
                upsert warehouseEq;
                System.debug('Your equipment was synced with the warehouse one');
                System.debug(warehouseEq);
            }
        }
    }
}
```

```
}  
}
```

WarehouseCalloutServiceTest.apxc :-

```
@isTest  
private class WarehouseCalloutServiceTest {  
    @isTest  
    static void testWareHouseCallout(){  
        Test.startTest();  
        // implement mock callout test here  
        Test.setMock(HTTPCalloutMock.class, new WarehouseCalloutServiceMock());  
        WarehouseCalloutService.qqfesc80rqna4lrmv0ga2m5m6f58twm7nqc27h0gx2();  
        Test.stopTest();  
        System.assertEquals(1, [SELECT count() FROM Product2]);  
    }  
}
```

WarehouseCalloutServiceMock.apxc :-

```
@isTest  
global class WarehouseCalloutServiceMock implements HttpCalloutMock {  
    // implement http mock callout  
    global static HttpResponse respond(HttpRequest request){  
        System.assertEquals('https://th-superbadge-apex.herokuapp.com/equipment',  
            request.getEndpoint());  
        System.assertEquals('GET', request.getMethod());  
        // Create a fake response  
        HttpResponse response = new HttpResponse();  
        response.setHeader('Content-Type', 'application/json');  
        response.setBody('{"_id":"55d66226726b611100aaf741","replacement":false,"quantity":5,"name":"Generator 1000 kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"}');  
        response.setStatusCode(200);  
        return response;  
    }  
}
```

```
}
```

Test scheduling logic

WarehouseSyncSchedule.apxc :-

```
global class WarehouseSyncSchedule implements Schedulable {
global void execute(SchedulableContext ctx) {
WarehouseCalloutService.qqfesc80rqna4ljmv0ga2m5m6f58twm7nqc27h0gx2();
}
}
```

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 ');
}
}
```

## PROCESS AUTOMATION SPECIALIST - SUPERBADGE

Automata leads

error condition formula

```
OR(AND(LEN(State) > 2,  
NOT(CONTAINS("AL:AK:AZ:AR:CA:CO:CT:DE:DC:FL:GA:HI:ID:IL:IN:IA:KS:KY:LA:ME:MD:MA:MI:MN:MS:MO:MT:NE:NV:NH:NJ:NM:NY:NC:ND:OH:OK:OR:PA:RI:SC:SD:TN:TX:UT:VT:VA:WA:WV:WI:WY", State)) ), NOT(OR(Country = "US",Country = "USA",Country = "United States", ISBLANK(Country))))
```

Automate accounts

error condition formula1

```
OR(AND(LEN(BillingState) > 2,  
NOT(CONTAINS("AL:AK:AZ:AR:CA:CO:CT:DE:DC:FL:GA:HI:ID:IL:IN:IA:KS:KY:LA:ME:MD:MA:MI:MN:MS:MO:MT:NE:NV:NH:NJ:NM:NY:NC:ND:OH:OK:OR:PA:RI:SC:SD:TN:TX:UT:VT:VA:WA:WV:WI:WY", BillingState)) ),AND(LEN(ShippingState) > 2,  
NOT(CONTAINS("AL:AK:AZ:AR:CA:CO:CT:DE:DC:FL:GA:HI:ID:IL:IN:IA:KS:KY:LA:ME:MD:MA:MI:MN:MS:MO:MT:NE:NV:NH:NJ:NM:NY:NC:ND:OH:OK:OR:PA:RI:SC:SD:TN:TX:UT:VT:VA:WA:WV:WI:WY", ShippingState)) ),NOT(OR(BillingCountry = "US",BillingCountry = "USA",BillingCountry = "United States", ISBLANK(BillingCountry))),  
NOT(OR(ShippingCountry = "US",ShippingCountry = "USA",ShippingCountry = "United States", ISBLANK(ShippingCountry))))
```

error condition formula1

```
ISCHANGED( Name ) && ( OR( ISPICKVAL( Type , 'Customer - Direct' ) ,ISPICKVAL( Type , 'Customer - Channel' ) ) )
```

Automata steps

formula

Case ( WEEKDAY( Date\_\_c ),

1,"Sunday",

2,"Monday",

3,"Tuesday",

4,"Wednesday",

5,"Thursday",

6,"Friday",

7,"Saturday",

Text(WEEKDay(Date\_\_c)))