DOCUMENTATION

Module Name: Get Started with Apex Triggers(apex triggers)

FileName:AccountAddressTrigger.apxt

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

Module Name: Bulk Apex Triggers(apex triggers)

Filename:ClosedOpportunityTrigger.apxt

```
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;     }
 }
```

Module Name: Get Started with Apex Unit Tests(Apex Testing)

FileName:VerifyDate.apxc

```
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;
        }

}
```

FileName:TestVerifyDate.apxc

```
@isTest
public class TestVerifyDate {
   @isTest static void test1(){
      Date
d=VerifyDate.CheckDates(Date.parse('01/01/2022'),Date.parse('01/03/2022'));
      system.assertEquals(Date.parse('01/03/2022'),d);
   }
   @isTest static void test2(){
      Date
d=VerifyDate.CheckDates(Date.parse('01/01/2022'),Date.parse('03/03/2022'));
      system.assertEquals(Date.parse('01/31/2022'),d);
   }
```

```
}
```

Module Name: Test Apex Triggers(Apex Testing)

FileName:RestrictContactByName.apxt

```
trigger RestrictContactByName on Contact (before insert) {
    //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');
                }

        }
}
```

FileName:TestRestrictContactByName.apxc

```
@isTest
public class TestRestrictContactByName {
   @istest
   public static void testContact(){
      Contact ct=new Contact();
      ct.LastName='INVALIDNAME';
      Database.SaveResult res=Database.insert(ct,false);
      system.assertEquals('The Last Name "INVALIDNAME" is not allowed for
DML',res.getErrors()[0].getMessage());
   }
}
```

Module Name:CreateTestDataforApexTests(ApexTesting)

FileName:RandomContactFactory.apxc

```
public class RandomContactFactory {
   public static List<Contact> generateRandomContacts(Integer n,string lastname){
      List<Contact> contacts= new List<Contact>();
      for(Integer i=0;i<n;i++){
         Contact c= new Contact(    FirstName='Test'+i,LastName= lastname);
```

```
        contacts.add(c);
      }
      return contacts;
   }
```

Module Name: Apex REST Callouts (Apex Integration)

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

FileName: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 );
 }
 }
```

FileName:AnimalLocatorMock.apxc

```
@isTest global class AnimalLocatorMock implements HttpCalloutMock {
   global HTTPResponse respond(HTTPRequest request) {
```

```
        HttpResponse response = new HttpResponse();
        response.setHeader('Content-Type', 'application/json');
        response.setBody('{"animals": ["id":1, "name":"chicken" , "eats":"chicken food",
"says":"cluck cluck"]}');
        response.setStatusCode(200);
        return response;   }
}
```

Module Name: Apex SOAP Callouts (Apex Integration)

FileName:ParkLocator.apxc

```
public class ParkLocator {
    public static String[] country(String country){
        ParkService.ParksImplPort parks = new ParkService.ParksImplPort();
        String[] parksname = parks.byCountry(country);
        return parksname;
    }
}
```

FileName:ParkLocatorTest.apxc

```
@isTest
private class ParkLocatorTest{
    @isTest
    static void testParkLocator() {
        Test.setMock(WebServiceMock.class, new ParkServiceMock());
        String[] arrayOfParks = ParkLocator.country('India');

        System.assertEquals('Park1', arrayOfParks[0]);
    }
}
```

FileName: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) {
      ParkService.byCountryResponse response_x = new
ParkService.byCountryResponse();
      List<String> lstOfDummyParks = new List<String> {'Park1','Park2','Park3'};
      response_x.return_x = lstOfDummyParks;

      response.put('response_x', response_x);
   }
}
```

Module Name: Apex Web Services (Apex Integration)

FileName:AccountManager.apxc

```
@RestResource(urlMapping='/Accounts/*/contacts')
global with sharing class AccountManager{
   @HttpGet
   global static Account getAccount(){
      RestRequest req = RestContext.request;
      String accId = req.requestURI.substringBetween('Accounts/', '/contacts');
      Account acc = [SELECT Id, Name, (SELECT Id, Name FROM Contacts)
                  FROM Account WHERE Id = :accId];

      return acc;
   }
}
```

FileName:AccountManagerTest.apxc

```
@IsTest
private class AccountManagerTest{
   @isTest static void testAccountManager(){
      Id recordId = getTestAccountId();
      // Set up a test request
      RestRequest request = new RestRequest();
      request.requestUri =
```

```
        'https://ap5.salesforce.com/services/apexrest/Accounts/'+ recordId +'/contacts';
        request.httpMethod = 'GET';
        RestContext.request = request;

        // Call the method to test
        Account  acc = AccountManager.getAccount();

        // Verify results
        System.assert(acc != null);
    }
    private static Id getTestAccountId(){
        Account acc = new Account(Name = 'TestAcc2');
        Insert acc;
        Contact con = new Contact(LastName = 'TestCont2', AccountId = acc.Id);
        Insert con;
        return acc.Id;
    }
}
```

Module Name: Use Future Methods(Apex Asynchronus)

FileName:AccountProcessor.apxc

```
public class AccountProcessor {
@future
  public static void countContacts(Set<id> setId)
  {
     List<Account> lstAccount = [select id,Number_of_Contacts__c , (select id from
contacts ) from account where id in :setId ];
     for( Account acc : lstAccount )
     {
        List<Contact> lstCont = acc.contacts ;

        acc.Number_of_Contacts__c = lstCont.size();
     }
     update lstAccount;
  }
}
```

FileName:AccountProcessorTest.apxc

```
@IsTest
public class AccountProcessorTest {
   public static testmethod void TestAccountProcessorTest()
   {
      Account a = new Account();
      a.Name = 'Test Account';
      Insert a;

      Contact cont = New Contact();
      cont.FirstName ='Bob';
      cont.LastName ='Masters';
      cont.AccountId = a.Id;
      Insert cont;

      set<Id> setAccId = new Set<ID>();
      setAccId.add(a.id);

      Test.startTest();
         AccountProcessor.countContacts(setAccId);
      Test.stopTest();

      Account ACC = [select Number_of_Contacts__c from Account where id = :a.id LIMIT
1];
      System.assertEquals ( Integer.valueOf(ACC.Number_of_Contacts__c) ,1);
  }

}
```

Module Name: Use Batch Apex (ApexAsynchronus)

FileName:LeadProcessor.apxc

```
global class LeadProcessor implements Database.Batchable<Sobject>
{
   global Database.QueryLocator start(Database.BatchableContext bc)
   {
      Database.QueryLocator qObj;
      qObj = Database.getQueryLocator('select Id, Name, LeadSource, Rating from Lead');
```

```
    return qObj;
  }

  global void execute(Database.BatchableContext bc, List<sObject> records)
  {

    List<Lead> leadRecords = (List<Lead>) records;
    List<Lead> updatingLeadList = new List<Lead>();
      for (Lead leadObj : leadRecords)
      {
        leadObj.LeadSource = 'Dreamforce';
        updatingLeadList.add(leadObj);
      }
    if(!updatingLeadList.isEmpty()){
      update updatingLeadList;
    }

  }

  global void finish(Database.BatchableContext bc){
 }
}
```

FileName:LeadProcessorTest.apxc

```
@isTest
private class LeadProcessorTest
{
  private static testMethod void LeadProcess()
  {
    List<Lead> lstLead = new List<Lead>();
    for(Integer i=0 ;i <200;i++)
    {
      lstLead.add(new Lead(LastName ='LastName'+i, Company ='demo'+i, City='New
York', Country='US', LeadSource='Phone inquiry'));
    }

    insert lstLead;
```

```
        Test.startTest();

            LeadProcessor obj = new LeadProcessor();
            DataBase.executeBatch(obj);

        Test.stopTest();
    }
}
```

Module Name: Control Processes with Queueable Apex(Apex Asynchronus)

FileName:AddPrimaryContact.apxc

```
public class AddPrimaryContact implements Queueable{
    Contact con;
    String state;

    public AddPrimaryContact(Contact con, String state){
        this.con = con;
        this.state = state;
    }
    public void execute(QueueableContext qc){
        List<Account> lstOfAccs = [SELECT Id FROM Account WHERE BillingState = :state
LIMIT 200];

        List<Contact> lstOfConts = new List<Contact>();
        for(Account acc : lstOfAccs){
            Contact conInst = con.clone(false,false,false,false);
            conInst.AccountId = acc.Id;

            lstOfConts.add(conInst);
        }

        INSERT lstOfConts;
    }
}
```

FileName:AddPrimaryContactTest.apxc

```
@isTest
public class AddPrimaryContactTest{
   @testSetup
   static void setup(){
      List<Account> lstOfAcc = new List<Account>();
      for(Integer i = 1; i <= 100; i++){
         if(i <= 50)
            lstOfAcc.add(new Account(name='AC'+i, BillingState = 'NY'));
         else
            lstOfAcc.add(new Account(name='AC'+i, BillingState = 'CA'));
      }

      INSERT lstOfAcc;
   }

   static testmethod void testAddPrimaryContact(){
      Contact con = new Contact(LastName = 'TestCont');
      AddPrimaryContact addPCIns = new AddPrimaryContact(CON ,'CA');

      Test.startTest();
      System.enqueueJob(addPCIns);
      Test.stopTest();

      System.assertEquals(50, [select count() from Contact]);
   }
}
```

Module Name: Schedule Jobs Using the Apex Scheduler (Apex Asynchronus)

FileName:DailyLeadProcessor.apxc

```
global class DailyLeadProcessor implements Schedulable {
      global void execute(SchedulableContext ctx) {
      //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;
    }
}
```

FileName:DailyLeadProcessorTest.apxc

```
@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 Name: Automate record creation (Apex Specialist SuperBadge)

FileName:MaintenanceRequest.apxt

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

FileName: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);
                }
            }
        }

        //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;
      }
    }
}
```

Module Name: Synchronize Salesforce data(Apex Specialist SuperBadge)

FileName:WarehouseCalloutService.apxc

```
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');
  }
}
```

Module Name: Schedule synchronization (Apex Specialist SuperBadge)

FileName:WarehouseSyncSchedule.apxc

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

FileName:WarehouseCalloutService.apxc

```
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');
  }
}
```

Module Name: Test automation logic(Apex Specialist SuperBadge)

FileName: MaintenanceRequest.apxt

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

FileName: 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);
        }
      }
    }
```

```
    //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;
      }
   }
}
```

FileName: MaintenanceRequestHelperTest.apxc

```
@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);
    }
}
```

Module Name: Test callout logic(Apex Specialist SuperBadge)

FileName: WarehouseCalloutService.apxc

```
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');
    }

}
```

FileName: 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":"Generator 1000
kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"},{"_id":"55d66226
726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d66226726b6
11100aaf743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
        response.setStatusCode(200);

        return response;
    }
}
```

FileName: 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);
    }
}
```

Module Name: test scheduling logic(Apex Specialist SuperBadge)

FileName: WarehouseSyncSchedule.apxc

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

FileName: WarehouseSyncScheduleTest.apxc

```
@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();
    }
}
```

FileName: 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":"Generator 1000
kW","maintenanceperiod":365,"lifespan":120,"cost":5000,"sku":"100003"},{"_id":"55d66226
726b611100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d66226726b6
11100aaf743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
        response.setStatusCode(200);

        return response;
    }
}
```