Apex Triggers :
https://trailhead.salesforce.com/content/learn/modules/apex_triggers?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1) Get Started with Apex Triggers

AccountAddressTrigger Code :

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

2) Bulk Apex Triggers Unit

ClosedOpportunityTrigger Code :

```
trigger ClosedOpportunityTrigger on Opportunity (after insert, after update) {
   List<Task> taskList = new List<Task>();

   for (Opportunity o :[SELECT Id,Name FROM Opportunity
                        WHERE Id IN :Trigger.New]){
      taskList.add(new Task(Subject='Follow Up Test Task',
                            WhatId=o.Id,
                            Status='Not Started',
                            Priority='Normal'));
   }
   if (taskList.size() > 0){
      insert taskList;
   }
}
```

Apex Testing :
https://trailhead.salesforce.com/content/learn/modules/apex_testing?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Get Started with Apex Unit Testing

VerifyDate Code :

```
public class VerifyDate {

    //method to handle potential checks against two dates
    public static Date CheckDates(Date date1, Date date2) {
        //if date2 is within the next 30 days of date1, use date2.  Otherwise use the end of the month
        if(DateWithin30Days(date1,date2)) {
            return date2;
        } else {
            return SetEndOfMonthDate(date1);
        }
    }

    //method to check if date2 is within the next 30 days of date1
    private static Boolean DateWithin30Days(Date date1, Date date2) {
        //check for date2 being in the past
    if( date2 < date1) { return false; }

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

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

```
        }

}
```

TestVerifyDate Code :

```
@isTest
private class TestVerifyDate {

   @isTest static void testCheckDates() {
      Date now = Date.today();
      Date lastOfTheMonth = Date.newInstance(now.year(), now.month(),
Date.daysInMonth(now.year(), now.month()));
      Date plus60 = Date.today().addDays(60);

                  Date d1 = VerifyDate.CheckDates(now, now);
      System.assertEquals(now, d1);

      Date d2 = VerifyDate.CheckDates(now, plus60);
      System.assertEquals(lastOfTheMonth, d2);
   }

}
```

2) Test Apex Triggers Unit

RestrictContactByName Code :

```
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 Code :

```
@isTest
private class TestRestrictContactByName {

   @isTest
   static void invalidName() {
      try {
         Contact c = new Contact(LastName='INVALIDNAME');
         insert c;
      }
      catch (Exception e) {
                        System.assert(true);
      }
   }

}
```

3) Create Test Data for Apex Tests :

RandomContactFactory Code :

```
public class RandomContactFactory {

   public static List<Contact> generateRandomContacts(Integer num, String lastName) {
      List<Contact> contacts = new List<Contact>();
      for (Integer i = 0; i < num; i++) {
         Contact c = new Contact(FirstName=i.format(), LastName=lastName);
         contacts.add(c);
      }
      return contacts;
```

```
    }

}
```

Asynchronous Apex
:https://trailhead.salesforce.com/content/learn/modules/asynchronous_apex?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz
2)Use Future Methods

AccountProcessor Code :

```
public class AccountProcessor {
    @future
    public static void countContacts(List<Id> accountIds) {
        List<Account> accounts = [SELECT Id,
                                  Name,
                                  Number_of_Contacts__c,
                                  (
                                    SELECT Contact.Id
                                     FROM Contacts
                                  )
                                FROM Account
                               WHERE Id in :accountIds];
        for (Account a : accounts) {
            a.Number_of_Contacts__c = a.Contacts.size();
        }
        update accounts;
    }
}
```

AccountProcessorTest Code :

```
@isTest
```

```
private class AccountProcessorTest {

    static TestMethod void myTest() {
        List<Account> accounts = new List<Account>();
        for (Integer i=0; i<100; i++) {
            Account account = new Account();
            account.Name = 'AccountProcessorTest Account ' + i;
            accounts.add(account);
        }
        insert accounts;

        List<Id> accountIds = new List<Id>();
        List<Contact> contacts = new List<Contact>();
        for (Account a : accounts) {
            accountIds.add(a.Id);
            for (Integer i=0; i<5; i++) {
                Contact contact = new Contact();
                contact.FirstName = 'AccountProcessor Test Contact';
                contact.LastName = String.valueOf(i);
                contact.AccountId = a.Id;
                contacts.add(contact);
            }
        }
        insert contacts;

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

        List<Account> results = [SELECT Id, Number_of_Contacts__c
                                 FROM Account
                                WHERE Id in :accountIds];
        for (Account a : results) {
            System.AssertEquals(5, a.Number_of_Contacts__c);
        }
    }
}
```

3)Use Batch Apex

LeadProcessor Code :

```
global class LeadProcessor implements Database.Batchable<sObject>, Database.Stateful {

   global Integer recs_processed = 0;

   global Database.QueryLocator start(Database.BatchableContext bc) {
      String sQuery = '';
      sQuery += 'SELECT Id, Name, Status,';
      sQuery += 'LeadSource ';
      sQuery += 'FROM Lead ';
      sQuery += 'LIMIT 100000';
      return Database.getQueryLocator(sQuery);
   }

   global void execute(Database.BatchableContext bc, List<Lead> scope) {
      for (Lead l : scope) {
         l.LeadSource = 'Dreamforce';
         recs_processed += 1;
      }
      update scope;
   }

   global void finish(Database.BatchableContext bc) {
      AsyncApexJob job = [SELECT Id,
                                Status,
                                NumberOfErrors,
                                TotalJobItems,
                                JobItemsProcessed,
                                CreatedBy.Email
                           FROM AsyncApexJob
                          WHERE Id = :bc.getJobId()];
      String s = '';
      s += job.JobItemsProcessed + ' job items processed ';
```

```
        s += 'out of ' + job.TotalJobItems + ' total job items.  ';
        s += job.NumberOfErrors + ' error(s) encountered. ';
        System.debug(s);
        s = recs_processed + ' record(s) processed.';
        System.debug(s);
    }
}
```

LeadProcessorTest Code :

```
@isTest
private class LeadProcessorTest {

    @testSetup
    static void createLeads() {
        List<Lead> leads = new List<Lead>();
        for (Integer i=0; i<200; i++) {
            Lead l = new Lead();
            l.FirstName = 'Test';
            l.LastName = 'Lead';
            l.Company = 'Test Lead ' + i;
            leads.add(l);
        }
        insert leads;
    }

    static TestMethod void myTest() {
        Test.startTest();
        LeadProcessor lp = new LeadProcessor();
        Id batchId = Database.executeBatch(lp);
        Test.stopTest();

        System.assertEquals(200, [SELECT Count()
                                  FROM Lead
                                 WHERE Name = 'Test Lead'
                                  AND LeadSource = 'Dreamforce']);
    }
```

```
}
```

4)Controp Processes with Queueable Apex

AddPrimaryContact Code :

```
public class AddPrimaryContact implements Queueable {

   private Contact contactObj;
   private String state_code;

   public AddPrimaryContact(Contact c, String s) {
      this.contactObj = c;
      this.state_code = s;
   }

   public void execute(QueueableContext context) {
      List<Account> accounts = [SELECT Id
                                FROM Account
                                WHERE BillingState = :this.state_code
                                LIMIT 200];

      List<Contact> contacts = new List<Contact>();
      for (Account a : accounts) {
         Contact c = this.contactObj.clone(false, false, false, false);
         c.AccountId = a.Id;
         contacts.add(c);
      }

      if (contacts.size() > 0) {
        insert contacts;
      }
   }
}
```

AddPrimaryContactTest Code :

```
@isTest
private class AddPrimaryContactTest {
    @testSetup
    static void setup() {
        List<Account> accounts = new List<Account>();
        for (Integer i=0; i<50; i++) {
            Account ny = new Account();
            ny.Name = 'Test Account (NY)';
            ny.BillingState = 'NY';
            accounts.add(ny);
            Account ca = new Account();
            ca.Name = 'Test Account (CA)';
            ca.BillingState = 'CA';
            accounts.add(ca);
        }
        insert accounts;
    }

    static TestMethod void myTest() {
        Contact contactObj = new Contact(
            FirstName = 'California',
            LastName = 'Bob'
        );
        String state_abbrev = 'CA';

        Test.startTest();
        AddPrimaryContact apc = new AddPrimaryContact(contactObj, state_abbrev);
        Id jobId = System.enqueueJob(apc);
        Test.stopTest();

        List<Account> accounts = [SELECT Id, (SELECT Contact.Name FROM
Account.Contacts) FROM Account WHERE BillingState = 'CA'];
        System.assertEquals(50, accounts.size());
        for (Account a : accounts) {
            System.assertEquals(a.Contacts.size(), 1);
        }
    }
```

```
}
```

5)Schedule Jobs Using the Apex Scheduler

DailyLeadProcessor Code :

```
global class DailyLeadProcessor implements Schedulable {

   global void execute(SchedulableContext ctx) {
      List<Lead> leads = [SELECT Id,
                          LeadSource
                   FROM Lead
                   WHERE LeadSource = '' OR LeadSource = null
                   LIMIT 200];
      for (Lead l : leads) {
         l.LeadSource = 'Dreamforce';
      }

      if (leads.size() > 0) {
         update leads;
      }
   }
}
```

DailyLeadProcessorTest Code :

```
@isTest
private class DailyLeadProcessorTest {

   @testSetup
   static void setup() {
      List<Lead> leads = new List<Lead>();
      for (Integer i=0; i<200; i++) {
         Lead l = new Lead();
```

```
            l.FirstName = 'Test';
            l.LastName = 'Lead ' + i;
            l.Company = 'Test Company ' + i;
            leads.add(l);
        }
        insert leads;
    }

    static TestMethod void myTest() {
        String jobName = 'Daily Lead Processor - Test';
        String CRON_EXP = '0 0 0 15 3 ? 2017'; // dummy cron entry

        test.startTest();
        DailyLeadProcessor dp = new DailyLeadProcessor();
        String JobId = System.schedule(jobName, CRON_EXP, dp);
        test.stopTest();

        List<Lead> results = [SELECT Id FROM Lead WHERE LeadSource =
'Dreamforce'];
        System.assertEquals(200, results.size());
    }
}
```

Apex Integration Services
:https://trailhead.salesforce.com/content/learn/modules/apex_integration_services?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz
2)Apex REST Callouts

AnimalLocator Code :

```
public class AnimalLocator {
```

```
  public static HttpResponse makeGetCallout {
     Http http = new Http();
     HttpRequest request = new HttpRequest();
     request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/:id');
     request.setMethod('GET');
     HttpResponse response = http.send(request);
     // If the request is successful, parse the JSON response.
     if (response.getStatusCode() == 200) {
       // Deserialize the JSON string into collections of primitive data types.
       Map<Integer, Object> Results
     }
  }
}
```

AnimalLocatorTest Code :

```
@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 Code :

```
@isTest
global class AnimalLocatorMock implements HttpCalloutMock {
   global HTTPResponse respond(HTTPRequest request) {
      HttpResponse response = new HttpResponse();
      response.setHeader('Content-Type', 'application/json');
      response.setBody('{"animal":{"id":1,"name":"chicken","eats":"chicken food","says":"cluck
cluck"}}');
      response.setStatusCode(200);
      return response;
```

```
    }
}
```

2)Apex SOAP Callouts

ParkService Code :

```
//Generated by wsdl2apex


public class ParkService {
    public class byCountryResponse {
        public String[] return_x;
        private String[] return_x_type_info = new
String[]{'return','http://parks.services/',null,'0','-1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://parks.services/','false','false'};
        private String[] field_order_type_info = new String[]{'return_x'};
    }
    public class byCountry {
        public String arg0;
        private String[] arg0_type_info = new
String[]{'arg0','http://parks.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://parks.services/','false','false'};
        private String[] field_order_type_info = new String[]{'arg0'};
    }
    public class ParksImplPort {
```

```
        public String endpoint_x = 'https://th-apex-soap-
service.herokuapp.com/service/parks';

        public Map<String,String> inputHttpHeaders_x;

        public Map<String,String> outputHttpHeaders_x;

        public String clientCertName_x;

        public String clientCert_x;

        public String clientCertPasswd_x;

        public Integer timeout_x;

        private String[] ns_map_type_info = new String[]{'http://parks.services/',
'ParkService'};

        public String[] byCountry(String arg0) {

            ParkService.byCountry request_x = new ParkService.byCountry();

            request_x.arg0 = arg0;

            ParkService.byCountryResponse response_x;

            Map<String, ParkService.byCountryResponse> response_map_x = new
Map<String, ParkService.byCountryResponse>();

            response_map_x.put('response_x', response_x);

            WebServiceCallout.invoke(

              this,

              request_x,

              response_map_x,

              new String[]{endpoint_x,

              '',
```

```
          'http://parks.services/',
          'byCountry',
          'http://parks.services/',
          'byCountryResponse',
          'ParkService.byCountryResponse'}
        );
        response_x = response_map_x.get('response_x');
        return response_x.return_x;
    }
  }
}
```

ParkLocator Code :

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

```
    }
}
```

ParkLocatorTest Code :

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

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

ParkServiceMock Code :

```
@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);
    }
}
```

4) Apex Web Services

AccountManager Code :

```
@RestResource(urlMapping='/Accounts/*/contacts')
global with sharing class AccountManager {


    @HttpGet
    global static account getAccount() {

        RestRequest request = RestContext.request;
```

```
        String accountId =
request.requestURI.substring(request.requestURI.lastIndexOf('/')-18,
          request.requestURI.lastIndexOf('/'));
        List<Account> a = [select id, name, (select id, name from
contacts) from account where id = :accountId];
        List<contact> co = [select id, name from contact where
account.id = :accountId];
        system.debug('** a[0]= '+ a[0]);
        return a[0];

    }

}
```

AccountManagerTest Code :

```
@Istest(SeeAllData=true)
public class AccountManagerTest {



    @IsTest
    public static void testaccountmanager() {
        RestRequest request = new RestRequest();
        request.requestUri = 'https://mannharleen-dev-
ed.my.salesforce.com/services/apexrest/Accounts/00190000016cw4tAAA/con
tacts';
        request.httpMethod = 'GET';
        RestContext.request = request;

                        system.debug('test account result = '+
AccountManager.getAccount());



    }


}
```

APEX SPECIALIST SUPERBADGE :

https://trailhead.salesforce.com/content/learn/modules/apex_integration_services?trailmix_creator_id=trailblazerconnect&trailmix_slug=salesforce-developer-catalyst

1)Quiz

2)Automate Record Creation

`MaintenanceRequestHelper Code :`

```
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;
      }
    }
}
```

MaitenanceRequest Code :

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

3)Synchronize Salesforce Data

WarehouseCalloutService Code :

```
public with sharing class WarehouseCalloutService {
```

```
    private static final String WAREHOUSE_URL = 'https://th-superbadge-
apex.herokuapp.com/equipment';

    //@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());
            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);
        }

    }
  }
}
```

4)Schedule Synchronization

`WarehouseSyncSchedule Code :`

```
global class WarehouseSyncSchedule implements Schedulable {
  global void execute(SchedulableContext ctx) {

    WarehouseCalloutService.runWarehouseEquipmentSync();
  }
}
```

5)Test Automatic Logic

`MaintenanceRequestHelperTest Code :`

```
@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;
  }
```

MaintenanceRequestHelper Code :

```
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 Code :

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

6) Test Callout Logic

WarehouseCalloutService Code :

```
public with sharing class WarehouseCalloutService {

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

   //@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());
         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 Code :

```
@isTest

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

`WarehouseCalloutServiceMock Code :`

```
@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;
    }
}
```

7) Test Scheduling Logic

WarehouseSyncSchedule Code :

```
global class WarehouseSyncSchedule implements Schedulable {
    global void execute(SchedulableContext ctx) {

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}
```

`WarehouseSyncScheduleTest Code :`

```
@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 ');


    }
}
```