APEX TRIGGERS

1. GET STARTED WITH APEX TRIGGERS:

- **AccountAddressTrigger.apxt**

```
trigger AccountAddressTrigger on Account (before insert, before update) {
    for (Account a : Trigger.New) {
        if (a.Match_Billing_Address__c == true && a.BillingPostalCode != null) {
            a.ShippingPostalCode = a.BillingPostalCode;
        }
    }
}
```

2. BULK APEX TRIGGERS:

- **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

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

APEX TESTING

1. GET STARTED WITH APEX UNIT TEST:

- **VerifyDate.apxc**

```
public class VerifyDate {
 public static Date CheckDates(Date date1, Date date2) {
        if(DateWithin30Days(date1,date2)) {
        return date2;
   } else {
        return SetEndOfMonthDate(date1);
   }
 }
 private static Boolean DateWithin30Days(Date date1, Date date2) {
 if( date2 < date1) { return false; }
 Date date30Days = date1.addDays(30);
   if( date2 >= date30Days ) { return false; }
   else { return true; }
 }
 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.apxc**

```
@isTest
private class TestVerifyDate {
    @isTest static void testDate2within30daysofDate1() {
        Date date1 = date.newInstance(2018, 03, 20);
        Date date2 = date.newInstance(2018, 04, 11);
        Date resultDate = VerifyDate.CheckDates(date1,date2);
        Date testDate = Date.newInstance(2018, 04, 11);
        System.assertEquals(testDate,resultDate);
```

```
    }
    @isTest static void testDate2beforeDate1() {
        Date date1 = date.newInstance(2018, 03, 20);
        Date date2 = date.newInstance(2018, 02, 11);
        Date resultDate = VerifyDate.CheckDates(date1,date2);
        Date testDate = Date.newInstance(2018, 02, 11);
        System.assertNotEquals(testDate, resultDate);
    }
    @isTest static void testDate2outside30daysofDate1() {
        Date date1 = date.newInstance(2018, 03, 20);
        Date date2 = date.newInstance(2018, 04, 25);
        Date resultDate = VerifyDate.CheckDates(date1,date2);
        Date testDate = Date.newInstance(2018, 03, 31);
        System.assertEquals(testDate,resultDate);
    }
}
```

2. TEST APEX TRIGGERS:

- **RestrictContactByName.apxt**

```
trigger RestrictContactByName on Contact (before insert, before update) {
    For (Contact c : Trigger.New) {
        if(c.LastName == 'INVALIDNAME') {    //invalidname is invalid
            c.AddError('The Last Name "'+c.LastName+'" is not

        }
    }
}
```

3.CREATE TEST DATA FOR APEX TESTS:

- **RandomContactFactory.apxc**

```apex
public class RandomContactFactory {
    public static list<contact> generateRandomContacts(integer n, string m) {
        list<contact> con = new list<contact>();
        for(integer i=1; i<n+1; i++) {
            contact c = new contact(firstname='test'+i,lastname=m);
            con.add(c);
        }
         return con;
    }
}
```

ASYNCRONOUS APEX

1. USE FUTURE METHODS:

- **AccountProcessor.apxc**

```apex
public class AccountProcessor {
    @future
    public static void countContacts(List<Id> accountId_lst) {
        Map<Id,Integer> account_cno = new Map<Id,Integer>();
        List<account> account_lst_all = new List<account>([select id, (select id from contacts) from account]);
        for(account a:account_lst_all) {
            account_cno.put(a.id,a.contacts.size()); //populate the map
        }
        List<account> account_lst = new List<account>(); // list of account that we will upsert
        for(Id accountId : accountId_lst) {
            if(account_cno.containsKey(accountId)) {
                account acc = new account();
```

```
                acc.Id = accountId;
                acc.Number_of_Contacts__c =
  account_cno.get(accountId);
                account_lst.add(acc);
            }
        }
        upsert account_lst;
    }
}
```

- **AccountProcessorTest.apxc**

```
@isTest
public class AccountProcessorTest {
@isTest
    public static void testFunc() {
        account acc = new account();
        acc.name = 'MATW INC';
        insert acc;
        contact con = new contact();
        con.lastname = 'Mann1';
        con.AccountId = acc.Id;
        insert con;
        contact con1 = new contact();
        con1.lastname = 'Mann2';
        con1.AccountId = acc.Id;
        insert con1;
        List<Id> acc_list = new List<Id>();
        acc_list.add(acc.Id);
        Test.startTest();
 AccountProcessor.countContacts(acc_list);
        Test.stopTest();
        List<account> acc1 = new List<account>([select
  Number_of_Contacts__c from account where id = :acc.id]);
        system.assertEquals(2,acc1[0].Number_of_Contacts__c);
    }
}
```

2. USE BATCH APEX:

- **LeadProcessor.apxc**

```
global class LeadProcessor implements Database.Batchable<sObject>
{
    global Database.QueryLocator start(Database.BatchableContext
bc) {
        return Database.getQueryLocator(
            'SELECT Id, LeadSource FROM Lead'
        );
    }
    global void execute(Database.BatchableContext bc, List<Lead>
leads) {
        System.debug(leads.size());
        for(Lead lead : leads){
            lead.LeadSource = 'Dreamforce';
        }
        update leads;
    }
    global void finish(Database.BatchableContext bc){
    }
}
```

- **LeadProcessorTest.apxc**

```
@isTest
private class LeadProcessorTest {
    @testSetup
    static void setup() {
        List<Lead> leads = new List<Lead>();
        // insert 10 leads
        for (Integer i=0;i<10;i++) {
            leads.add(new Lead(LastName='Lead '+i,
Company='TestCompany'));
        }
        insert leads;
```

```
    }
    static testmethod void test() {
        Test.startTest();
            LeadProcessor lp = new LeadProcessor();
            Database.executeBatch(lp);
        Test.stopTest();
        // after the testing stops, assert records were updated properly
        System.assertEquals(10, [SELECT count() FROM Lead where LeadSource = 'Dreamforce']);
    }
}
```

3. CONTROL PROCESSES WITH QUEUEABLE APEX

- **AddPrimaryContact.apxc**

```
public class AddPrimaryContact implements Queueable {
    public contact c;
    public String state;

    public AddPrimaryContact(Contact c, String state) {
        this.c = c;
        this.state = state;
    }
    public void execute(QueueableContext qc) {
        system.debug('this.c = '+this.c+' this.state =

        List<Account> acc_lst = new List<account>([select id, name, BillingState from account where account.BillingState = :this.state limit 200]);
        List<contact> c_lst = new List<contact>();
        for(account a: acc_lst) {
            contact c = new contact();
            c = this.c.clone(false, false, false, false);
            c.AccountId = a.Id;
            c_lst.add(c);
        }
```

```
        insert c_lst;
    }
}
```

- **AddPrimaryContactTest.apxc**

```
@IsTest
public class AddPrimaryContactTest {
    @IsTest
    public static void testing() {
        List<account> acc_lst = new List<account>();
        for (Integer i=0; i<50;i++) {
            account a = new
account(name=string.valueOf(i),billingstate='NY');
            system.debug('account a = '+a);
            acc_lst.add(a);
        }
        for (Integer i=0; i<50;i++) {
            account a = new
account(name=string.valueOf(50+i),billingstate='CA');
            system.debug('account a = '+a);
            acc_lst.add(a);
        }
        insert acc_lst;
        Test.startTest();
        contact c = new contact(lastname='alex');
        AddPrimaryContact apc = new AddPrimaryContact(c,'CA');
        system.debug('apc = '+apc);
        System.enqueueJob(apc);
        Test.stopTest();
        List<contact> c_lst = new List<contact>([select id from
contact]);
        Integer size = c_lst.size();
        system.assertEquals(50, size);
    }
}
```

4. SCHEDULE JOBS USING APEX SCHEDULER:

- **DailyLeadProcessor.apxc**

```
global class DailyLeadProcessor implements Schedulable{
    global void execute(SchedulableContext ctx){
        List<Lead> leads = [SELECT Id, LeadSource FROM Lead WHERE
LeadSource = ''];
        if(leads.size() > 0){
            List<Lead> newLeads = new List<Lead>();
            for(Lead lead : leads){
                lead.LeadSource = 'DreamForce';
                newLeads.add(lead);
            }
            update newLeads;
        }
    }
}
```

- **DailyLeadProcessorTest.apxc**

```
@isTest
private class DailyLeadProcessorTest{
    public static String CRON_EXP = '0 0 0 2 6 ? 2022';
    static testmethod void testScheduledJob(){
        List<Lead> leads = new List<Lead>();
        for(Integer i = 0; i < 200; i++){
            Lead lead = new Lead(LastName = 'Test ' + i,
LeadSource = '', Company = 'Test Company ' + i, Status = 'Open -


            leads.add(lead);
        }
        insert leads;
        Test.startTest();
        String jobId = System.schedule('Update LeadSource to
```

```
13    new DailyLeadProcessor());
14         Test.stopTest();
15     }
16 }
```

APEX INTEGRATION SERVICES

1. APEX REST CALLOUTS:

- **AnimalLocator.apxc**

```
1  public class AnimalLocator {
2   public class cls_animal {
3     public Integer id;
4     public String name;
5     public String eats;
6     public String says;
7   }
8  public class JSONOutput{
9   public cls_animal animal;
10 }
11
12     public static String getAnimalNameById (Integer id) {
13         Http http = new Http();
14         HttpRequest request = new HttpRequest();
15         request.setEndpoint('https://th-apex-http-

16         //request.setHeader('id', String.valueof(id)); -- cannot
   be used in this challenge :)
17         request.setMethod('GET');
18         HttpResponse response = http.send(request);
19         system.debug('response: ' + response.getBody());
20         jsonOutput results = (jsonOutput)
   JSON.deserialize(response.getBody(), jsonOutput.class);
21    system.debug('results= ' + results.animal.name);
```

```
        return(results.animal.name);
    }
}
```

- **AnimalLocatorMock.apxc**

```
@IsTest
global class AnimalLocatorMock implements HttpCalloutMock {
    global HTTPresponse respond(HTTPrequest request) {
        Httpresponse response = new Httpresponse();
        response.setStatusCode(200);

response.setBody('{"animal":{"id":1,"name":"chicken","eats":"chick

        return response;
    }
}
```

- **AnimalLocatorTest.apxc**

```
@IsTest
public class AnimalLocatorTest {
    @isTest
    public static void testAnimalLocator() {
        Test.setMock(HttpCalloutMock.class, new
AnimalLocatorMock());
        String s =  AnimalLocator.getAnimalNameById(1);
        system.debug('string returned: ' + s);
    }
}
```

2. APEX SOAP CALLOUTS:

- **ParkService.apxc**

```
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-

        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.apxc**

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

- **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]);
```

```
    }
}
```

3. APEX WEB SERVICES:

- **AccountManager.apxc**

```
@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.apxc**

```
@Istest(SeeAllData=true)
public class AccountManagerTest {
    @IsTest
    public static void testaccountmanager() {
        RestRequest request = new RestRequest();
```

```
6          request.requestUri = 'https://mannharleen-dev-
   00016cw4tAAA

7          request.httpMethod = 'GET';
8          RestContext.request = request;
9     system.debug('test account result = '+
   AccountManager.getAccount());
10     }
11 }
```

APEX SPECIALIST SUPERBADGE

1. AUTOMATE RECORD CREATION:

- **MaintenanceRequest.apxt**

```
1  trigger MaintenanceRequest on Case (before update, after update) {
2      if(Trigger.isUpdate && Trigger.isAfter){
3          MaintenanceRequestHelper.updateWorkOrders(Trigger.New,
   Trigger.OldMap);
4      }
5  }
```

- **MaintenanceRequestHelper.apxc**

```
1  public with sharing class MaintenanceRequestHelper {
2      public static void updateworkOrders(List<Case> updWorkOrders,
   Map<Id,Case> nonUpdCaseMap) {
3          Set<Id> validIds = new Set<Id>();
4          For (Case c : updWorkOrders){
5              if (nonUpdCaseMap.get(c.Id).Status != 'Closed' &&
   c.Status == 'Closed'){
6                  if (c.Type == 'Repair' || c.Type == 'Routine
```

```
                    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;
        }
    }
}
```

2. SYNCHRONIZATION SALESFORCE DATA WITH AN EXTERNAL SYSTEM:

- **WarehouseCalloutService.apxc**

```
public with sharing class WarehouseCalloutService implements
Queueable {
    private static final String WAREHOUSE_URL = 'https://th-

    @future(callout=true)
    public static void runWarehouseEquipmentSync(){
        Http http = new Http();
        HttpRequest request = new HttpRequest();

        request.setEndpoint(WAREHOUSE_URL);
```

```
9           request.setMethod('GET');
10          HttpResponse response = http.send(request);
11
12          List<Product2> warehouseEq = new List<Product2>();
13
14          if (response.getStatusCode() == 200){
15              List<Object> jsonResponse =
    (List<Object>)JSON.deserializeUntyped(response.getBody());
16              System.debug(response.getBody());
17
18              for (Object eq : jsonResponse){
19                  Map<String,Object> mapJson =
    (Map<String,Object>)eq;
20                  Product2 myEq = new Product2();
21                  myEq.Replacement_Part__c = (Boolean)
    mapJson.get('replacement');
22                  myEq.Name = (String) mapJson.get('name');
23                  myEq.Maintenance_Cycle__c = (Integer)
    mapJson.get('maintenanceperiod');
24                  myEq.Lifespan_Months__c = (Integer)
    mapJson.get('lifespan');
25                  myEq.Cost__c = (Integer) mapJson.get('cost');
26                  myEq.Warehouse_SKU__c = (String)
    mapJson.get('sku');
27                  myEq.Current_Inventory__c = (Double)
    mapJson.get('quantity');
28                  myEq.ProductCode = (String) mapJson.get('_id');
29                  warehouseEq.add(myEq);
30              }
31              if (warehouseEq.size() > 0){
32                  upsert warehouseEq;
33                  System.debug('Your equipment was synced with the

34              }
35          }
36      }
37      public static void execute (QueueableContext context){
38          runWarehouseEquipmentSync();
39      }
40
```

```
41 }
```

3. SCHEDULE SYNCHRONIZATION USING APEX CODE:

- **WarehouseSyncSchedule.apxc**

```
1  global with sharing class WarehouseSyncSchedule implements
   Schedulable{
2      global void execute(SchedulableContext ctx){
3          System.enqueueJob(new WarehouseCalloutService());
4      }
5  }
```

4. TEST AUTOMATION LOGIC:

- **MaintenanceRequestHelperTest.apxc**

```
1  @istest
2  public with sharing class MaintenanceRequestHelperTest {
3
4      private static final string STATUS_NEW = 'New';
5      private static final string WORKING = 'Working';
6      private static final string CLOSED = 'Closed';
7      private static final string REPAIR = 'Repair';
8      private static final string REQUEST_ORIGIN = 'Web';
9      private static final string REQUEST_TYPE = 'Routine

10     private static final string REQUEST_SUBJECT = 'Testing

11
12     PRIVATE STATIC Vehicle__c createVehicle(){
13         Vehicle__c Vehicle = new Vehicle__C(name = 'SuperTruck');
14         return Vehicle;
15     }
16
17     PRIVATE STATIC Product2 createEq(){
```

```
18          product2 equipment = new product2(name = 'SuperEquipment',
19                                            lifespan_months__C = 10,
20                                            maintenance_cycle__C =
    10,
21                                            replacement_part__c =
    true);
22          return equipment;
23      }
24
25      PRIVATE STATIC Case createMaintenanceRequest(id vehicleId, id
    equipmentId){
26          case cs = new case(Type=REPAIR,
27                             Status=STATUS_NEW,
28                             Origin=REQUEST_ORIGIN,
29                             Subject=REQUEST_SUBJECT,
30                             Equipment__c=equipmentId,
31                             Vehicle__c=vehicleId);
32          return cs;
33      }
34
35      PRIVATE STATIC Equipment_Maintenance_Item__c createWorkPart(id
    equipmentId,id requestId){
36          Equipment_Maintenance_Item__c wp = new
    Equipment_Maintenance_Item__c(Equipment__c = equipmentId,
37
    Maintenance_Request__c = requestId);
38          return wp;
39      }
40
41
42      @istest
43      private static void testMaintenanceRequestPositive(){
44          Vehicle__c vehicle = createVehicle();
45          insert vehicle;
46          id vehicleId = vehicle.Id;
47
48          Product2 equipment = createEq();
49          insert equipment;
50          id equipmentId = equipment.Id;
51
```

```
52          case somethingToUpdate =
    createMaintenanceRequest(vehicleId,equipmentId);
53          insert somethingToUpdate;
54
55          Equipment_Maintenance_Item__c workP =
    createWorkPart(equipmentId,somethingToUpdate.id);
56          insert workP;
57
58          test.startTest();
59          somethingToUpdate.status = CLOSED;
60          update somethingToUpdate;
61          test.stopTest();
62
63          Case newReq = [Select id, subject, type, Equipment__c,
    Date_Reported__c, Vehicle__c, Date_Due__c
64                         from case
65                         where status =:STATUS_NEW];
66
67          Equipment_Maintenance_Item__c workPart = [select id
68                                                    from
    Equipment_Maintenance_Item__c
69                                                    where
    Maintenance_Request__c =:newReq.Id];
70
71          system.assert(workPart != null);
72          system.assert(newReq.Subject != null);
73          system.assertEquals(newReq.Type, REQUEST_TYPE);
74          SYSTEM.assertEquals(newReq.Equipment__c, equipmentId);
75          SYSTEM.assertEquals(newReq.Vehicle__c, vehicleId);
76          SYSTEM.assertEquals(newReq.Date_Reported__c,
    system.today());
77      }
78
79      @istest
80      private static void testMaintenanceRequestNegative(){
81          Vehicle__C vehicle = createVehicle();
82          insert vehicle;
83          id vehicleId = vehicle.Id;
84
85          product2 equipment = createEq();
```

```
86          insert equipment;
87          id equipmentId = equipment.Id;
88
89          case emptyReq =
    createMaintenanceRequest(vehicleId,equipmentId);
90          insert emptyReq;
91
92          Equipment_Maintenance_Item__c workP =
    createWorkPart(equipmentId, emptyReq.Id);
93          insert workP;
94
95          test.startTest();
96          emptyReq.Status = WORKING;
97          update emptyReq;
98          test.stopTest();
99
100            list<case> allRequest = [select id
101                                     from case];
102
103            Equipment_Maintenance_Item__c workPart = [select id
104                                                      from
    Equipment_Maintenance_Item__c
105                                                      where
    Maintenance_Request__c = :emptyReq.Id];
106
107            system.assert(workPart != null);
108            system.assert(allRequest.size() == 1);
109        }
110
111        @istest
112        private static void testMaintenanceRequestBulk(){
113            list<Vehicle__C> vehicleList = new list<Vehicle__C>();
114            list<Product2> equipmentList = new list<Product2>();
115            list<Equipment_Maintenance_Item__c> workPartList = new
    list<Equipment_Maintenance_Item__c>();
116            list<case> requestList = new list<case>();
117            list<id> oldRequestIds = new list<id>();
118
119            for(integer i = 0; i < 300; i++){
120               vehicleList.add(createVehicle());
```

```
121                 equipmentList.add(createEq());
122             }
123             insert vehicleList;
124             insert equipmentList;
125 
126             for(integer i = 0; i < 300; i++){
127 
    requestList.add(createMaintenanceRequest(vehicleList.get(i).id,
    equipmentList.get(i).id));
128             }
129             insert requestList;
130 
131             for(integer i = 0; i < 300; i++){
132 
    workPartList.add(createWorkPart(equipmentList.get(i).id,
    requestList.get(i).id));
133             }
134             insert workPartList;
135 
136             test.startTest();
137             for(case req : requestList){
138                 req.Status = CLOSED;
139                 oldRequestIds.add(req.Id);
140             }
141             update requestList;
142             test.stopTest();
143 
144             list<case> allRequests = [select id
145                                       from case
146                                       where status =: STATUS_NEW];
147 
148             list<Equipment_Maintenance_Item__c> workParts = [select
    id
149                                                              from
    Equipment_Maintenance_Item__c
150                                                              where
    Maintenance_Request__c in: oldRequestIds];
151 
152             system.assert(allRequests.size() == 300);
153         }
```

```
154   }
```

- **MaintenanceRequestHelper.apxc**

```
1  public with sharing class MaintenanceRequestHelper {
2      public static void updateworkOrders(List<Case> updWorkOrders,
   Map<Id,Case> nonUpdCaseMap) {
3          Set<Id> validIds = new Set<Id>();
4
5
6          For (Case c : updWorkOrders){
7              if (nonUpdCaseMap.get(c.Id).Status != 'Closed' &&
   c.Status == 'Closed'){
8                  if (c.Type == 'Repair' || c.Type == 'Routine

9                      validIds.add(c.Id);
10                 }
11             }
12         }
13         if (!validIds.isEmpty()){
14             List<Case> newCases = new List<Case>();
15             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)
16                                                          FROM Case
   WHERE Id IN :validIds]);
17             Map<Id,Decimal> maintenanceCycles = new
   Map<ID,Decimal>();
18             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];
19
20         for (AggregateResult ar : results){
21             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;
        }
    }
```

```
58 }
```

- **MaintenanceRequest.apxt**

```
1  trigger MaintenanceRequest on Case (before update, after update) {
2      if(Trigger.isUpdate && Trigger.isAfter){
3          MaintenanceRequestHelper.updateWorkOrders(Trigger.New,
   Trigger.OldMap);
4      }
5  }
```

5. TEST CALLOUT LOGIC:

- **WarehouseCalloutService.apxc**

```
1  public with sharing class WarehouseCalloutService {
2
3      private static final String WAREHOUSE_URL = 'https://th-

4
5      //@future(callout=true)
6      public static void runWarehouseEquipmentSync(){
7
8          Http http = new Http();
9          HttpRequest request = new HttpRequest();
10
11         request.setEndpoint(WAREHOUSE_URL);
12         request.setMethod('GET');
13         HttpResponse response = http.send(request);
14
15
16         List<Product2> warehouseEq = new List<Product2>();
17
18         if (response.getStatusCode() == 200){
19             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

                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.runWarehouseEquipmentSync();
        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-
));
        System.assertEquals('GET', request.getMethod());

        // Create a fake response
        HttpResponse response = new HttpResponse();
        response.setHeader('Content-Type', 'application/json');

response.setBody('[{"_id":"55d66226726b611100aaf741","replacement"



        response.setStatusCode(200);
        return response;
    }
}
```

6. TEST SCHEDULING LOGIC:

- **WarehouseSyncSchedule.apxc**

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

        WarehouseCalloutService.runWarehouseEquipmentSync();
    }
}
```

- **WarehouseSyncScheduleTest.apxc**

```
@isTest
public class WarehouseSyncScheduleTest {
    @isTest static void WarehouseescheduleTest(){
        String scheduleTime = '00 00 01 * * ?';
        Test.startTest();
        Test.setMock(HttpCalloutMock.class, new
WarehouseCalloutServiceMock());
        String jobID=System.schedule('Warehouse Time To Schedule

        Test.stopTest();
        CronTrigger a=[SELECT Id FROM CronTrigger where
NextFireTime > today];
        System.assertEquals(jobID, a.Id,'Schedule ');
    }
}
```

****