

AccountAddressTrigger:

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

AccountManager:

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

    @HttpGet
    global static Account getAccount(){
        RestRequest request = RestContext.request;
        string accountId = request.requestURI.substringBetween('Accounts/', '/contacts');
        Account result = [SELECT Id, Name, (Select Id, Name from Contacts) from Account where
Id=:accountId Limit 1];
        return result;
    }
}
```

AccountManagerTest:

```
@IsTest
private class AccountManagerTest {
    @isTest static void testGetContactsByAccountId(){
        Id recordId = createTestRecord();
        RestRequest request = new RestRequest();
        request.requestUri =
'https://yourInstance.my.salesforce.com/services/apexrest/Accounts/'

        + recordId + '/contacts';
        request.httpMethod = 'GET';
        RestContext.request = request;
        Account thisAccount = AccountManager.getAccount();
    }
}
```

```

        System.assert(thisAccount != null);
        System.assertEquals('Test record', thisAccount.Name);
    }

    static Id createTestRecord(){
        Account accountTest = new Account(
            Name ='Test record');
        insert accountTest;

        Contact contactTest = new Contact(
            FirstName='John',
            LastName = 'Doe',
            AccountId = accountTest.Id

        );
        insert contactTest;

        return accountTest.Id
    };
}

```

AccountProcessor:

```

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;
    }
}

```

AccountProcessorTest:

```
@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> setAcclId = new Set<ID>();
        setAcclId.add(a.id);

        Test.startTest();
        AccountProcessor.countContacts(setAcclId);
        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);
    }
}
```

AddPrimaryContact:

```
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 = '+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:

```

@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);
    }

}

```

AnimalLocator:

```

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');
    }
}

```

AnimalLocatorMock:

```

@Test
global class AnimalLocatorMock implements HttpCalloutMock {
    // Implement this interface method
    global HTTPResponse respond(HTTPRequest request) {
        // Create a fake response
        HttpResponse response = new HttpResponse();
        response.setHeader('Content-Type', 'application/json');
        response.setBody('{"animals": ["majestic badger", "fluffy bunny", "scary bear", "chicken",
"mighty moose"]}');
        response.getStatusCode(200);
        return response;
    }
}

```

AnimalLocatorTest:

```
@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 );
    }
}
```

AnimalsCallouts:

```
public class AnimalsCallouts {
    public static HttpResponse makeGetCallout() {
        Http http = new Http();
        HttpRequest request = new HttpRequest();
        request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals');
        request.setMethod('GET');
        HttpResponse response = http.send(request);
        // If the request is successful, parse the JSON response.
        if(response.getStatusCode() == 200) {
            // Deserializes the JSON string into collections of primitive data types.
            Map<String, Object> results = (Map<String, Object>)
JSON.deserializeUntyped(response.getBody());
            // Cast the values in the 'animals' key as a list
            List<Object> animals = (List<Object>) results.get('animals');
            System.debug('Received the following animals:');
            for(Object animal: animals) {
                System.debug(animal);
            }
        }
        return response;
    }

    public static HttpResponse makePostCallout() {
        Http http = new Http();
        HttpRequest request = new HttpRequest();
        request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals');
        request.setMethod('POST');
        request.setHeader('Content-Type', 'application/json;charset=UTF-8');
```

```

request.setBody("{\"name\":\"mighty moose\"}");
HttpResponse response = http.send(request);
// Parse the JSON response
if(response.getStatusCode() != 201) {
    System.debug('The status code returned was not expected: ' +
        response.getStatusCode() + ' ' + response.getStatus());
} else {
    System.debug(response.getBody());
}
return response;
}
}

```

AnimalsCalloutsTest:

```

@isTest
private class AnimalsCalloutsTest {
    @isTest static void testGetCallout() {
        // Create the mock response based on a static resource
        StaticResourceCalloutMock mock = new StaticResourceCalloutMock();
        mock.setStaticResource('GetAnimalResource');
        mock.setStatusCode(200);
        mock.setHeader('Content-Type', 'application/json;charset=UTF-8');
        // Associate the callout with a mock response
        Test.setMock(HttpCalloutMock.class, mock);
        // Call method to test
        HttpResponse result = AnimalsCallouts.makeGetCallout();
        // Verify mock response is not null
        System.assertNotEquals(null,result, 'The callout returned a null response.');
```

// Verify status code

```

        System.assertEquals(200,result.getStatusCode(), 'The status code is not 200.');
```

// Verify content type

```

        System.assertEquals('application/json;charset=UTF-8',
            result.getHeader('Content-Type'),
            'The content type value is not expected.');
```

// Verify the array contains 3 items

```

        Map<String, Object> results = (Map<String, Object>)
            JSON.deserializeUntyped(result.getBody());
        List<Object> animals = (List<Object>) results.get('animals');
```

System.assertEquals(3, animals.size(), 'The array should only contain 3 items.');

```

    }
}

```

AnimalsHttpCalloutMock:

```
@isTest
global class AnimalsHttpCalloutMock implements HttpCalloutMock {
    // Implement this interface method
    global HTTPResponse respond(HTTPRequest request) {
        // Create a fake response
        HTTPResponse response = new HTTPResponse();
        response.setHeader('Content-Type', 'application/json');
        response.setBody('{"animals": ["majestic badger", "fluffy bunny", "scary bear", "chicken",
"mighty moose"]}');
        response.setStatusCode(200);
        return response;
    }
}
```

AsyncCalculatorServices:

```
public class AsyncCalculatorServices {
    public class doDivideResponseFuture extends System.WebServiceCalloutFuture {
        public Double getValue() {
            calculatorServices.doDivideResponse response =
(calculatorServices.doDivideResponse)System.WebServiceCallout.endInvoke(this);
            return response.return_x;
        }
    }
    public class doSubtractResponseFuture extends System.WebServiceCalloutFuture {
        public Double getValue() {
            calculatorServices.doSubtractResponse response =
(calculatorServices.doSubtractResponse)System.WebServiceCallout.endInvoke(this);
            return response.return_x;
        }
    }
    public class doMultiplyResponseFuture extends System.WebServiceCalloutFuture {
        public Double getValue() {
            calculatorServices.doMultiplyResponse response =
(calculatorServices.doMultiplyResponse)System.WebServiceCallout.endInvoke(this);
            return response.return_x;
        }
    }
}
```



```

public class doAddResponseFuture extends System.WebServiceCalloutFuture {
    public Double getValue() {
        calculatorServices.doAddResponse response =
(calculatorServices.doAddResponse)System.WebServiceCallout.endInvoke(this);
        return response.return_x;
    }
}

public class AsyncCalculatorImplPort {
    public String endpoint_x = 'https://th-apex-soap-service.herokuapp.com/service/calculator';
    public Map<String,String> inputHttpHeaders_x;
    public String clientCertName_x;
    public Integer timeout_x;
    private String[] ns_map_type_info = new String[]{'http://calculator.services/',
'calculatorServices'};
    public AsyncCalculatorServices.doDivideResponseFuture
beginDoDivide(System.Continuation continuation,Double arg0,Double arg1) {
        calculatorServices.doDivide request_x = new calculatorServices.doDivide();
        request_x.arg0 = arg0;
        request_x.arg1 = arg1;
        return (AsyncCalculatorServices.doDivideResponseFuture)
System.WebServiceCallout.beginInvoke(
            this,
            request_x,
            AsyncCalculatorServices.doDivideResponseFuture.class,
            continuation,
            new String[]{endpoint_x,
            ",
            'http://calculator.services/',
            'doDivide',
            'http://calculator.services/',
            'doDivideResponse',
            'calculatorServices.doDivideResponse'}
            );
    }

    public AsyncCalculatorServices.doSubtractResponseFuture
beginDoSubtract(System.Continuation continuation,Double arg0,Double arg1) {
        calculatorServices.doSubtract request_x = new calculatorServices.doSubtract();
        request_x.arg0 = arg0;
        request_x.arg1 = arg1;
        return (AsyncCalculatorServices.doSubtractResponseFuture)
System.WebServiceCallout.beginInvoke(

```

```

        this,
        request_x,
        AsyncCalculatorServices.doSubtractResponseFuture.class,
        continuation,
        new String[]{endpoint_x,
            "",
            'http://calculator.services/',
            'doSubtract',
            'http://calculator.services/',
            'doSubtractResponse',
            'calculatorServices.doSubtractResponse'}
    );
}

public AsyncCalculatorServices.doMultiplyResponseFuture
beginDoMultiply(System.Continuation continuation, Double arg0, Double arg1) {
    calculatorServices.doMultiply request_x = new calculatorServices.doMultiply();
    request_x.arg0 = arg0;
    request_x.arg1 = arg1;
    return (AsyncCalculatorServices.doMultiplyResponseFuture)
System.WebServiceCallout.beginInvoke(
    this,
    request_x,
    AsyncCalculatorServices.doMultiplyResponseFuture.class,
    continuation,
    new String[]{endpoint_x,
        "",
        'http://calculator.services/',
        'doMultiply',
        'http://calculator.services/',
        'doMultiplyResponse',
        'calculatorServices.doMultiplyResponse'}
    );
}

public AsyncCalculatorServices.doAddResponseFuture beginDoAdd(System.Continuation
continuation, Double arg0, Double arg1) {
    calculatorServices.doAdd request_x = new calculatorServices.doAdd();
    request_x.arg0 = arg0;
    request_x.arg1 = arg1;
    return (AsyncCalculatorServices.doAddResponseFuture)
System.WebServiceCallout.beginInvoke(
    this,

```

```

        request_x,
        AsyncCalculatorServices.doAddResponseFuture.class,
        continuation,
        new String[]{endpoint_x,
            "",
            'http://calculator.services/',
            'doAdd',
            'http://calculator.services/',
            'doAddResponse',
            'calculatorServices.doAddResponse'}
    );
}
}
}

```

AsyncParkService:

//Generated by wsdl2apex

```

public class AsyncParkService {
    public class byCountryResponseFuture extends System.WebServiceCalloutFuture {
        public String[] getValue() {
            ParkService.byCountryResponse response =
(ParkService.byCountryResponse)System.WebServiceCallout.endInvoke(this);
            return response.return_x;
        }
    }
    public class AsyncParksImplPort {
        public String endpoint_x = 'https://th-apex-soap-service.herokuapp.com/service/parks';
        public Map<String,String> inputHttpHeaders_x;
        public String clientCertName_x;
        public Integer timeout_x;
        private String[] ns_map_type_info = new String[]{"http://parks.services/", 'ParkService'};
        public AsyncParkService.byCountryResponseFuture beginByCountry(System.Continuation
continuation,String arg0) {
            ParkService.byCountry request_x = new ParkService.byCountry();
            request_x.arg0 = arg0;
            return (AsyncParkService.byCountryResponseFuture)
System.WebServiceCallout.beginInvoke(
                this,
                request_x,

```

```

        AsyncParkService.byCountryResponseFuture.class,
        continuation,
        new String[]{endpoint_x,
            "",
            'http://parks.services/',
            'byCountry',
            'http://parks.services/',
            'byCountryResponse',
            'ParkService.byCountryResponse'}
        );
    }
}
}

```

CalculatorServices:

```

public class calculatorServices {
    public class doDivideResponse {
        public Double return_x;
        private String[] return_x_type_info = new
String[]{'return','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/','false','false'};
        private String[] field_order_type_info = new String[]{'return_x'};
    }
    public class doMultiply {
        public Double arg0;
        public Double arg1;
        private String[] arg0_type_info = new
String[]{'arg0','http://calculator.services/',null,'0','1','false'};
        private String[] arg1_type_info = new
String[]{'arg1','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/','false','false'};
        private String[] field_order_type_info = new String[]{'arg0','arg1'};
    }
    public class doAdd {
        public Double arg0;
        public Double arg1;
        private String[] arg0_type_info = new
String[]{'arg0','http://calculator.services/',null,'0','1','false'};

```

```

        private String[] arg1_type_info = new
String[]{'arg1','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/',false,false'};
        private String[] field_order_type_info = new String[]{'arg0','arg1'};
    }
    public class doAddResponse {
        public Double return_x;
        private String[] return_x_type_info = new
String[]{'return','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/',false,false'};
        private String[] field_order_type_info = new String[]{'return_x'};
    }
    public class doDivide {
        public Double arg0;
        public Double arg1;
        private String[] arg0_type_info = new
String[]{'arg0','http://calculator.services/',null,'0','1','false'};
        private String[] arg1_type_info = new
String[]{'arg1','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/',false,false'};
        private String[] field_order_type_info = new String[]{'arg0','arg1'};
    }
    public class doSubtract {
        public Double arg0;
        public Double arg1;
        private String[] arg0_type_info = new
String[]{'arg0','http://calculator.services/',null,'0','1','false'};
        private String[] arg1_type_info = new
String[]{'arg1','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://calculator.services/',false,false'};
        private String[] field_order_type_info = new String[]{'arg0','arg1'};
    }
    public class doSubtractResponse {
        public Double return_x;
        private String[] return_x_type_info = new
String[]{'return','http://calculator.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new

```

```

String[]{'http://calculator.services/', 'false', 'false'};
    private String[] field_order_type_info = new String[]{'return_x'};
}
public class doMultiplyResponse {
    public Double return_x;
    private String[] return_x_type_info = new
String[]{'return', 'http://calculator.services/', null, '0', '1', 'false'};
    private String[] apex_schema_type_info = new
String[]{'http://calculator.services/', 'false', 'false'};
    private String[] field_order_type_info = new String[]{'return_x'};
}
public class CalculatorImplPort {
    public String endpoint_x = 'https://th-apex-soap-service.herokuapp.com/service/calculator';
    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://calculator.services/',
'calculatorServices'};
    public Double doDivide(Double arg0, Double arg1) {
        calculatorServices.doDivide request_x = new calculatorServices.doDivide();
        request_x.arg0 = arg0;
        request_x.arg1 = arg1;
        calculatorServices.doDivideResponse response_x;
        Map<String, calculatorServices.doDivideResponse> response_map_x = new Map<String,
calculatorServices.doDivideResponse>();
        response_map_x.put('response_x', response_x);
        WebServiceCallout.invoke(
            this,
            request_x,
            response_map_x,
            new String[]{endpoint_x,
            ",
            'http://calculator.services/',
            'doDivide',
            'http://calculator.services/',
            'doDivideResponse',
            'calculatorServices.doDivideResponse'}
        );
    }
}

```

```

        response_x = response_map_x.get('response_x');
        return response_x.return_x;
    }

    public Double doSubtract(Double arg0, Double arg1) {
        calculatorServices.doSubtract request_x = new calculatorServices.doSubtract();
        request_x.arg0 = arg0;
        request_x.arg1 = arg1;
        calculatorServices.doSubtractResponse response_x;
        Map<String, calculatorServices.doSubtractResponse> response_map_x = new
Map<String, calculatorServices.doSubtractResponse>();
        response_map_x.put('response_x', response_x);
        WebServiceCallout.invoke(
            this,
            request_x,
            response_map_x,
            new String[]{endpoint_x,
                "",
                'http://calculator.services/',
                'doSubtract',
                'http://calculator.services/',
                'doSubtractResponse',
                'calculatorServices.doSubtractResponse'}
        );
        response_x = response_map_x.get('response_x');
        return response_x.return_x;
    }

    public Double doMultiply(Double arg0, Double arg1) {
        calculatorServices.doMultiply request_x = new calculatorServices.doMultiply();
        request_x.arg0 = arg0;
        request_x.arg1 = arg1;
        calculatorServices.doMultiplyResponse response_x;
        Map<String, calculatorServices.doMultiplyResponse> response_map_x = new
Map<String, calculatorServices.doMultiplyResponse>();
        response_map_x.put('response_x', response_x);
        WebServiceCallout.invoke(
            this,
            request_x,
            response_map_x,
            new String[]{endpoint_x,
                "",
                'http://calculator.services/',

```

```

        'doMultiply',
        'http://calculator.services/',
        'doMultiplyResponse',
        'calculatorServices.doMultiplyResponse'}
    );
    response_x = response_map_x.get('response_x');
    return response_x.return_x;
}

public Double doAdd(Double arg0, Double arg1) {
    calculatorServices.doAdd request_x = new calculatorServices.doAdd();
    request_x.arg0 = arg0;
    request_x.arg1 = arg1;
    calculatorServices.doAddResponse response_x;
    Map<String, calculatorServices.doAddResponse> response_map_x = new Map<String,
calculatorServices.doAddResponse>();
    response_map_x.put('response_x', response_x);
    WebServiceCallout.invoke(
        this,
        request_x,
        response_map_x,
        new String[]{endpoint_x,
            "",
            'http://calculator.services/',
            'doAdd',
            'http://calculator.services/',
            'doAddResponse',
            'calculatorServices.doAddResponse'}
    );
    response_x = response_map_x.get('response_x');
    return response_x.return_x;
}
}
}

```

ClosedOpportunityTrigger:

```

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;
}
}

```

ContactsTodayController:

```

public class ContactsTodayController {

    @AuraEnabled
    public static List<Contact> getContactsForToday() {

        List<Task> my_tasks = [SELECT Id, Subject, Whold FROM Task WHERE OwnerId =
:UserInfo.getUserId() AND IsClosed = false AND Whold != null];
        List<Event> my_events = [SELECT Id, Subject, Whold FROM Event WHERE OwnerId =
:UserInfo.getUserId() AND StartDateTime >= :Date.today() AND Whold != null];
        List<Case> my_cases = [SELECT ID, ContactId, Status, Subject FROM Case WHERE OwnerId
= :UserInfo.getUserId() AND IsClosed = false AND ContactId != null];

        Set<Id> contactIds = new Set<Id>();
        for(Task tsk : my_tasks) {
            contactIds.add(tsk.Whold);
        }
        for(Event evt : my_events) {
            contactIds.add(evt.Whold);
        }
        for(Case cse : my_cases) {
            contactIds.add(cse.ContactId);
        }

        List<Contact> contacts = [SELECT Id, Name, Phone, Description FROM Contact WHERE Id
IN :contactIds];

        for(Contact c : contacts) {
            c.Description = "";
            for(Task tsk : my_tasks) {
                if(tsk.Whold == c.Id) {
                    c.Description += 'Because of Task "' + tsk.Subject + "'\n';
                }
            }
        }
    }
}

```

```

    }
    for(Event evt : my_events) {
        if(evt.Whold == c.Id) {
            c.Description += 'Because of Event "' + evt.Subject + "'\n';
        }
    }
    for(Case cse : my_cases) {
        if(cse.ContactId == c.Id) {
            c.Description += 'Because of Case "' + cse.Subject + "'\n';
        }
    }
}

return contacts;
}
}

```

ContactsTodayControllerTest:

```

@Test
public class ContactsTodayControllerTest {

    @Test
    public static void testGetContactsForToday() {

        Account acct = new Account(
            Name = 'Test Account'
        );
        insert acct;

        Contact c = new Contact(
            AccountId = acct.Id,
            FirstName = 'Test',
            LastName = 'Contact'
        );
        insert c;

        Task tsk = new Task(
            Subject = 'Test Task',
            Whold = c.Id,

```

```

        Status = 'Not Started'
    );
    insert tsk;

    Event evt = new Event(
        Subject = 'Test Event',
        Whold = c.Id,
        StartDateTime = Date.today().addDays(5),
        EndDateTime = Date.today().addDays(6)
    );
    insert evt;

    Case cse = new Case(
        Subject = 'Test Case',
        ContactId = c.Id
    );
    insert cse;

    List<Contact> contacts = ContactsTodayController.getContactsForToday();
    System.assertEquals(1, contacts.size());
    System.assert(contacts[0].Description.containsIgnoreCase(tsk.Subject));
    System.assert(contacts[0].Description.containsIgnoreCase(evt.Subject));
    System.assert(contacts[0].Description.containsIgnoreCase(cse.Subject));
}

@IsTest
public static void testGetNoContactsForToday() {

    Account acct = new Account(
        Name = 'Test Account'
    );
    insert acct;

    Contact c = new Contact(
        AccountId = acct.Id,
        FirstName = 'Test',
        LastName = 'Contact'
    );
    insert c;

```

```

Task tsk = new Task(
    Subject = 'Test Task',
    Whold = c.Id,
    Status = 'Completed'
);
insert tsk;

Event evt = new Event(
    Subject = 'Test Event',
    Whold = c.Id,
    StartDateTime = Date.today().addDays(-6),
    EndDateTime = Date.today().addDays(-5)
);
insert evt;

Case cse = new Case(
    Subject = 'Test Case',
    ContactId = c.Id,
    Status = 'Closed'
);
insert cse;

List<Contact> contacts = ContactsTodayController.getContactsForToday();
System.assertEquals(0, contacts.size());

}

}

```

CreateDefaultData:

```

public with sharing class CreateDefaultData{
    Static Final String TYPE_ROUTINE_MAINTENANCE = 'Routine Maintenance';
    //gets value from custom metadata How_We_Roll_Settings__mdt to know if Default data was
    created
    @AuraEnabled
    public static Boolean isDataCreated() {
        How_We_Roll_Settings__c      customSetting =
        How_We_Roll_Settings__c.getOrgDefaults();
        return customSetting.Is_Data_Created__c;
    }
}

```

```

//creates Default Data for How We Roll application
@AuraEnabled
public static void createDefaultData(){
    List<Vehicle__c> vehicles = createVehicles();
    List<Product2> equipment = createEquipment();
    List<Case> maintenanceRequest = createMaintenanceRequest(vehicles);
    List<Equipment_Maintenance_Item__c> joinRecords = createJoinRecords(equipment,
maintenanceRequest);

    updateCustomSetting(true);
}

public static void updateCustomSetting(Boolean isDataCreated){
    How_We_Roll_Settings__c customSetting =
How_We_Roll_Settings__c.getOrgDefaults();
    customSetting.Is_Data_Created__c = isDataCreated;
    upsert customSetting;
}

public static List<Vehicle__c> createVehicles(){
    List<Vehicle__c> vehicles = new List<Vehicle__c>();
    vehicles.add(new Vehicle__c(Name = 'Toy Hauler RV', Air_Conditioner__c = true,
Bathrooms__c = 1, Bedrooms__c = 1, Model__c = 'Toy Hauler RV'));
    vehicles.add(new Vehicle__c(Name = 'Travel Trailer RV', Air_Conditioner__c = true,
Bathrooms__c = 2, Bedrooms__c = 2, Model__c = 'Travel Trailer RV'));
    vehicles.add(new Vehicle__c(Name = 'Teardrop Camper', Air_Conditioner__c = true,
Bathrooms__c = 1, Bedrooms__c = 1, Model__c = 'Teardrop Camper'));
    vehicles.add(new Vehicle__c(Name = 'Pop-Up Camper', Air_Conditioner__c = true,
Bathrooms__c = 1, Bedrooms__c = 1, Model__c = 'Pop-Up Camper'));
    insert vehicles;
    return vehicles;
}

public static List<Product2> createEquipment(){
    List<Product2> equipments = new List<Product2>();
    equipments.add(new Product2(Warehouse_SKU__c = '55d66226726b611100aaf741',name
= 'Generator 1000 kW', Replacement_Part__c = true, Cost__c = 100 ,Maintenance_Cycle__c =
100));
    equipments.add(new Product2(name = 'Fuse 20B', Replacement_Part__c = true, Cost__c =

```

```

1000, Maintenance_Cycle__c = 30 ));
    equipments.add(new Product2(name = 'Breaker 13C',Replacement_Part__c = true,Cost__c =
100 , Maintenance_Cycle__c = 15));
    equipments.add(new Product2(name = 'UPS 20 VA',Replacement_Part__c = true,Cost__c =
200 , Maintenance_Cycle__c = 60));
    insert equipments;
    return equipments;

}

```

```

public static List<Case> createMaintenanceRequest(List<Vehicle__c> vehicles){
    List<Case> maintenanceRequests = new List<Case>();
    maintenanceRequests.add(new Case(Vehicle__c = vehicles.get(1).Id, Type =
TYPE_ROUTINE_MAINTENANCE, Date_Reported__c = Date.today()));
    maintenanceRequests.add(new Case(Vehicle__c = vehicles.get(2).Id, Type =
TYPE_ROUTINE_MAINTENANCE, Date_Reported__c = Date.today()));
    insert maintenanceRequests;
    return maintenanceRequests;
}

```

```

public static List<Equipment_Maintenance_Item__c> createJoinRecords(List<Product2>
equipment, List<Case> maintenanceRequest){
    List<Equipment_Maintenance_Item__c> joinRecords = new
List<Equipment_Maintenance_Item__c>();
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(0).Id, Maintenance_Request__c = maintenanceRequest.get(0).Id));
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(1).Id, Maintenance_Request__c = maintenanceRequest.get(0).Id));
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(2).Id, Maintenance_Request__c = maintenanceRequest.get(0).Id));
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(0).Id, Maintenance_Request__c = maintenanceRequest.get(1).Id));
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(1).Id, Maintenance_Request__c = maintenanceRequest.get(1).Id));
    joinRecords.add(new Equipment_Maintenance_Item__c(Equipment__c =
equipment.get(2).Id, Maintenance_Request__c = maintenanceRequest.get(1).Id));
    insert joinRecords;
    return joinRecords;

}
}

```

CreateDefaultDataTest:

```
@isTest
private class CreateDefaultDataTest {
    @isTest
    static void createData_test(){
        Test.startTest();
        CreateDefaultData.createDefaultData();
        List<Vehicle__c> vehicles = [SELECT Id FROM Vehicle__c];
        List<Product2> equipment = [SELECT Id FROM Product2];
        List<Case> maintenanceRequest = [SELECT Id FROM Case];
        List<Equipment_Maintenance_Item__c> joinRecords = [SELECT Id FROM
Equipment_Maintenance_Item__c];

        System.assertEquals(4, vehicles.size(), 'There should have been 4 vehicles created');
        System.assertEquals(4, equipment.size(), 'There should have been 4 equipment created');
        System.assertEquals(2, maintenanceRequest.size(), 'There should have been 2
maintenance request created');
        System.assertEquals(6, joinRecords.size(), 'There should have been 6 equipment
maintenance items created');

    }

    @isTest
    static void updateCustomSetting_test(){
        How_We_Roll_Settings__c customSetting =
How_We_Roll_Settings__c.getOrgDefaults();
        customSetting.Is_Data_Created__c = false;
        upsert customSetting;

        System.assertEquals(false, CreateDefaultData.isDataCreated(), 'The custom setting
How_We_Roll_Settings__c.Is_Data_Created__c should be false');

        customSetting.Is_Data_Created__c = true;
        upsert customSetting;

        System.assertEquals(true, CreateDefaultData.isDataCreated(), 'The custom setting
How_We_Roll_Settings__c.Is_Data_Created__c should be true');

    }
}
```

```
}
```

DailyLeadProcessor:

```
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:

```
@isTest
private class DailyLeadProcessorTest{
    @testSetup
    static void setup(){
        List<Lead> lstofLead = new List<Lead>();
        for(Integer i = 1; i <= 200; i++){
            Lead ld = new Lead(Company = 'Comp' + i, LastName = 'LN' + i, status='working -
Contacted');
            lstofLead.add(ld);
        }
        Insert lstofLead;
    }

    static testmethod void testDailyLeadProcessorscheduledJob(){
        String sch = '0 5 12 * * ?';
        Test.startTest();
        String jobId = System.Schedule('ScheduledApexText', sch, new
DailyLeadProcessor());
    }
}
```



```

        List<Lead> IstofLead=[SELECT Id FROM Lead WHERE Leadsources = null LIMIT 200];
        system.assertEquals(200, Istoflead.size());
        Test.stopTest();
    }
}

```

GeocodingService:

```

public with sharing class GeocodingService {
    private static final String BASE_URL =
'https://nominatim.openstreetmap.org/search?format=json';

    @InvocableMethod(callout=true label='Geocode address')
    public static List<Coordinates> geocodeAddresses(
        List<GeocodingAddress> addresses
    ) {
        List<Coordinates> computedCoordinates = new List<Coordinates>();

        for (GeocodingAddress address : addresses) {
            String geocodingUrl = BASE_URL;
            geocodingUrl += (String.isNotBlank(address.street))
                ? '&street=' + address.street
                : "";
            geocodingUrl += (String.isNotBlank(address.city))
                ? '&city=' + address.city
                : "";
            geocodingUrl += (String.isNotBlank(address.state))
                ? '&state=' + address.state
                : "";
            geocodingUrl += (String.isNotBlank(address.country))
                ? '&country=' + address.country
                : "";
            geocodingUrl += (String.isNotBlank(address.postalcode))
                ? '&postalcode=' + address.postalcode
                : "";

            Coordinates coords = new Coordinates();
            if (geocodingUrl != BASE_URL) {
                Http http = new Http();
                HttpRequest request = new HttpRequest();
                request.setEndpoint(geocodingUrl);
            }
        }
    }
}

```

```

        request.setMethod('GET');
        request.setHeader(
            'http-referer',
            URL.getSalesforceBaseUrl().toExternalForm()
        );
        HttpResponse response = http.send(request);
        if (response.getStatusCode() == 200) {
            List<Coordinates> deserializedCoords = (List<Coordinates>) JSON.deserialize(
                response.getBody(),
                List<Coordinates>.class
            );
            coords = deserializedCoords[0];
        }
    }

    computedCoordinates.add(coords);
}
return computedCoordinates;
}

public class GeocodingAddress {
    @InvocableVariable
    public String street;
    @InvocableVariable
    public String city;
    @InvocableVariable
    public String state;
    @InvocableVariable
    public String country;
    @InvocableVariable
    public String postalcode;
}

public class Coordinates {
    @InvocableVariable
    public Decimal lat;
    @InvocableVariable
    public Decimal lon;
}
}

```

GeocodingServiceTest:

@isTest

```
private with sharing class GeocodingServiceTest {  
    private static final String STREET = 'Camino del Jueves 26';  
    private static final String CITY = 'Armillá';  
    private static final String POSTAL_CODE = '18100';  
    private static final String STATE = 'Granada';  
    private static final String COUNTRY = 'Spain';  
    private static final Decimal LATITUDE = 3.123;  
    private static final Decimal LONGITUDE = 31.333;
```

@isTest

```
static void successResponse() {  
    // GIVEN  
    GeocodingService.GeocodingAddress address = new  
GeocodingService.GeocodingAddress();  
    address.street = STREET;  
    address.city = CITY;  
    address.postalcode = POSTAL_CODE;  
    address.state = STATE;  
    address.country = COUNTRY;  
  
    Test.setMock(  
        HttpCalloutMock.class,  
        new OpenStreetMapHttpCalloutMockImpl()  
    );  
  
    // WHEN  
    List<GeocodingService.Coordinates> computedCoordinates =  
GeocodingService.geocodeAddresses(  
        new List<GeocodingService.GeocodingAddress>{ address }  
    );  
  
    // THEN  
    System.assert(  
        computedCoordinates.size() == 1,  
        'Expected 1 pair of coordinates were returned'  
    );  
    System.assert(  
        computedCoordinates[0].lat == LATITUDE,
```

```

        'Expected mock lat was returned'
    );
    System.assert(
        computedCoordinates[0].lon == LONGITUDE,
        'Expected mock lon was returned'
    );
}
@Test
static void blankAddress() {
    // GIVEN
    GeocodingService.GeocodingAddress address = new
GeocodingService.GeocodingAddress();

    Test.setMock(
        HttpCalloutMock.class,
        new OpenStreetMapHttpCalloutMockImpl()
    );

    // WHEN
    List<GeocodingService.Coordinates> computedCoordinates =
GeocodingService.geocodeAddresses(
        new List<GeocodingService.GeocodingAddress>{ address }
    );

    // THEN
    System.assert(
        computedCoordinates.size() == 1,
        'Expected 1 pair of coordinates were returned'
    );
    System.assert(
        computedCoordinates[0].lat == null,
        'Expected null lat was returned'
    );
    System.assert(
        computedCoordinates[0].lon == null,
        'Expected null lon was returned'
    );
}
@Test
static void errorResponse() {
    // GIVEN

```

```

        GeocodingService.GeocodingAddress address = new
GeocodingService.GeocodingAddress();
        address.street = STREET;
        address.city = CITY;
        address.postalcode = POSTAL_CODE;
        address.state = STATE;
        address.country = COUNTRY;

Test.setMock(
    HttpCalloutMock.class,
    new OpenStreetMapHttpCalloutMockImplError()
);

// WHEN
List<GeocodingService.Coordinates> computedCoordinates =
GeocodingService.geocodeAddresses(
    new List<GeocodingService.GeocodingAddress>{ address }
);

// THEN
System.assert(
    computedCoordinates.size() == 1,
    'Expected 1 pair of coordinates were returned'
);
System.assert(
    computedCoordinates[0].lat == null,
    'Expected null lat was returned'
);
System.assert(
    computedCoordinates[0].lon == null,
    'Expected null lon was returned'
);
}

```

```

public class OpenStreetMapHttpCalloutMockImpl implements HttpCalloutMock {
    public HTTPResponse respond(HTTPRequest req) {
        HttpResponse res = new HttpResponse();
        res.setHeader('Content-Type', 'application/json');
        res.setBody('{"lat": ' + LATITUDE + ', "lon": ' + LONGITUDE + '}');
        res.setStatusCode(200);
        return res;
    }
}

```

```

    }
}

public class OpenStreetMapHttpCalloutMockImplError implements HttpCalloutMock {
    public HTTPResponse respond(HTTPRequest req) {
        HTTPResponse res = new HTTPResponse();
        res.setHeader('Content-Type', 'application/json');
        res.setStatusCode(400);
        return res;
    }
}
}

```

LeadProcessor:

```

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

    //Creating a variable that will keep the count of Leads processed:
    global Integer recordsProcessed = 0;

    //Retrieving all Leads records (First step in Batch)
    global Database.QueryLocator start(Database.BatchableContext bc) {
        return Database.getQueryLocator([SELECT ID, LeadSource FROM Lead]);
    }

    //Processing all retrieved records (Second step in Batch)
    global void execute(Database.BatchableContext bc, List<Lead> scope) {
        for (Lead lead : scope) {
            lead.LeadSource = 'Dreamforce';
            recordsProcessed = recordsProcessed + 1;
            System.debug(lead.LeadSource);
        }
        update scope;
    }

    //Finishing (Final step in Batch)
    global void finish(Database.BatchableContext bc){
        System.debug(recordsProcessed + ' records processed. Shazam!');
    }
}

```

LeadProcessorTest:

```
@isTest
private class LeadProcessorTest {

    //Creating 200 lead records to Test
    @TestSetup
    static void setup(){
        List<Lead> leads = new List<Lead>();

        for (Integer i = 0; i < 200; i++) {
            //Adding a new lead to the lead list
            leads.add(new Lead(LastName='Lead ' + i, Company='Company Number ' + i,
                Status='Open - Not Contacted'));
        }

        //Inserting the lead list
        insert leads;
    }

    static testMethod void test() {

        Test.startTest();
        LeadProcessor lp = new LeadProcessor();
        Id batchId = Database.executeBatch(lp);
        Test.stopTest();

        // after the testing stops, assert records were updated properly
        System.assertEquals(200, [select count() from lead where LeadSource = 'Dreamforce']);
    }
}
```

MaintenanceRequest:

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

MaintenanceRequestHelper:

```
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;
}
}
}
}

```

MaintenanceRequestHelperTest:

@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++){

equipmentMaintenanceItem.add(createEquipmentMaintenanceItem(equipmentList.get(i).id,
caseList.get(i).id));
}
insert equipmentMaintenanceItem;

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);
    }
}

```

OpportunityAlertController:

```

public class OpportunityAlertController {

    @AuraEnabled
    public static List<Opportunity> getOpportunities(Decimal daysSinceLastModified, String
oppStage, Boolean hasOpen) {
        DateTime lastModifiedDateFilter =
DateTime.now().addDays((Integer)daysSinceLastModified * -1);
        List<Opportunity> opportunities = [
            SELECT Id, Name, StageName, LastModifiedDate, CloseDate
            FROM Opportunity
            WHERE StageName = :oppStage AND LastModifiedDate <= :lastModifiedDateFilter
        ];
        Map<Id,Opportunity> oppMap = new Map<Id,Opportunity>(opportunities);
        if(hasOpen == true) {
            List<Task> tasks = [SELECT ID, WhatId FROM TASK WHERE IsClosed = false AND WhatId
IN :oppMap.keySet()];
            List<Opportunity> opps_with_tasks = new List<Opportunity>();
            for(Task ta : tasks) {
                if(oppMap.containsKey(ta.WhatId)) {
                    opps_with_tasks.add(oppMap.get(ta.WhatId));
                }
            }
            opportunities = opps_with_tasks;
        }
        return opportunities;
    }

}

```

OpportunityAlertControllerTest:

```

@IsTest
public class OpportunityAlertControllerTest {

```

```

@IsTest
public static void testGetOpptyWithoutOpenTasks() {

    Opportunity oppty = new Opportunity(
        Name = 'Test Oppty',
        CloseDate = Date.today(),
        StageName = 'Prospecting'
    );
    insert oppty;

    Task tsk = new Task(
        Subject = 'Test Task',
        WhatId = oppty.Id,
        Status = 'Completed'
    );
    insert tsk;

    List<Opportunity> opps;

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', false);
    System.assertEquals( 1, opps.size() );

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', true);
    System.assertEquals( 0, opps.size() );

}

```

```

@IsTest
public static void testGetOpptyWithOpenTasks() {

    Opportunity oppty = new Opportunity(
        Name = 'Test Oppty',
        CloseDate = Date.today(),
        StageName = 'Prospecting'
    );
    insert oppty;

    Task tsk = new Task(
        Subject = 'Test Task',
        WhatId = oppty.Id,
        Status = 'Not Started'
    );
    insert tsk;

    List<Opportunity> opps;

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', false);
    System.assertEquals( 1, opps.size() );

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', true);
    System.assertEquals( 1, opps.size() );

}

```

```

    );
    insert tsk;

    List<Opportunity> opps;

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', false);
    System.assertEquals( 1, opps.size() );

    opps = OpportunityAlertController.getOpportunities(0, 'Prospecting', true);
    System.assertEquals( 1, opps.size() );

}

}

```

PagedResult:

```

public with sharing class PagedResult {
    @AuraEnabled
    public Integer pageSize { get; set; }

    @AuraEnabled
    public Integer pageNumber { get; set; }

    @AuraEnabled
    public Integer totalItemCount { get; set; }

    @AuraEnabled
    public Object[] records { get; set; }
}

```

ParkLocator:

```

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

```

ParkLocatorTest:

```
@isTest
private class ParkLocatorTest {
    @isTest static void testCallout() {
        Test.setMock(WebServiceMock.class, new ParkServiceMock ());
        String country = 'United States';
        List<String> result = ParkLocator.country(country);
        List<String> parks = new List<String>{'Yellowstone', 'Mackinac National Park', 'Yosemite'};
        System.assertEquals(parks, result);
    }
}
```

ParkService:

```
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;
    }
}
}

```

ParkServiceMock:

```

@isTest
global class ParkServiceMock implements WebServiceMock {
    global void doInvoke(
        Object stub,
        Object request,
        Map<String, Object> response,
        String endpoint,
        String soapAction,
        String requestName,
        String responseNS,
        String responseName,
        String responseType) {
        // start - specify the response you want to send
        ParkService.byCountryResponse response_x = new ParkService.byCountryResponse();
        response_x.return_x = new List<String>{'Yellowstone', 'Mackinac National Park', 'Yosemite'};
        // end
        response.put('response_x', response_x);
    }
}

```

```
}
```

PropertyController:

```
public with sharing class PropertyController {
    private static final Decimal DEFAULT_MAX_PRICE = 99999999;
    private static final Integer DEFAULT_PAGE_SIZE = 9;

    /**
     * Endpoint that retrieves a paged and filtered list of properties
     * @param searchKey String used for searching on property title, city and tags
     * @param maxPrice Maximum price
     * @param minBedrooms Minimum number of bedrooms
     * @param minBathrooms Minimum number of bathrooms
     * @param pageSize Number of properties per page
     * @param pageNumber Page number
     * @return PagedResult object holding the paged and filtered list of properties
     */
    @AuraEnabled(cacheable=true)
    public static PagedResult getPagedPropertyList(
        String searchKey,
        Decimal maxPrice,
        Integer minBedrooms,
        Integer minBathrooms,
        Integer pageSize,
        Integer pageNumber
    ) {
        // Normalize inputs
        Decimal safeMaxPrice = (maxPrice == null
            ? DEFAULT_MAX_PRICE
            : maxPrice);
        Integer safeMinBedrooms = (minBedrooms == null ? 0 : minBedrooms);
        Integer safeMinBathrooms = (minBathrooms == null ? 0 : minBathrooms);
        Integer safePageSize = (pageSize == null
            ? DEFAULT_PAGE_SIZE
            : pageSize);
        Integer safePageNumber = (pageNumber == null ? 1 : pageNumber);

        String searchPattern = '%' + searchKey + '%';
        Integer offset = (safePageNumber - 1) * safePageSize;
```

```

PagedResult result = new PagedResult();
result.pageSize = safePageSize;
result.pageNumber = safePageNumber;
result.totalItemCount = [
    SELECT COUNT()
    FROM Property__c
    WHERE
        (Name LIKE :searchPattern
        OR City__c LIKE :searchPattern
        OR Tags__c LIKE :searchPattern)
        AND Price__c <= :safeMaxPrice
        AND Beds__c >= :safeMinBedrooms
        AND Baths__c >= :safeMinBathrooms
];
result.records = [
    SELECT
        Id,
        Address__c,
        City__c,
        State__c,
        Description__c,
        Price__c,
        Baths__c,
        Beds__c,
        Thumbnail__c,
        Location__Latitude__s,
        Location__Longitude__s
    FROM Property__c
    WHERE
        (Name LIKE :searchPattern
        OR City__c LIKE :searchPattern
        OR Tags__c LIKE :searchPattern)
        AND Price__c <= :safeMaxPrice
        AND Beds__c >= :safeMinBedrooms
        AND Baths__c >= :safeMinBathrooms
    WITH SECURITY_ENFORCED
    ORDER BY Price__c
    LIMIT :safePageSize
    OFFSET :offset
];
return result;

```

```

}

/**
 * Endpoint that retrieves pictures associated with a property
 * @param propertyId Property Id
 * @return List of ContentVersion holding the pictures
 */
@AuraEnabled(cacheable=true)
public static List<ContentVersion> getPictures(Id propertyId) {
    List<ContentDocumentLink> links = [
        SELECT Id, LinkedEntityId, ContentDocumentId
        FROM ContentDocumentLink
        WHERE
            LinkedEntityId = :propertyId
            AND ContentDocument.FileType IN ('PNG', 'JPG', 'GIF')
        WITH SECURITY_ENFORCED
    ];

    if (links.isEmpty()) {
        return null;
    }

    Set<Id> contentIds = new Set<Id>();

    for (ContentDocumentLink link : links) {
        contentIds.add(link.ContentDocumentId);
    }

    return [
        SELECT Id, Title
        FROM ContentVersion
        WHERE ContentDocumentId IN :contentIds AND IsLatest = TRUE
        WITH SECURITY_ENFORCED
        ORDER BY CreatedDate
    ];
}
}

```

RandomContactFactory:

```

public class RandomContactFactory {
    public static List<Contact> generateRandomContacts(Integer numContacts, String
lastName){
        List<Contact> contacts = new List<Contact>();

        for(Integer i=0;i<numContacts;i++) {
            Contact c = new Contact(FirstName='Test ' + i, LastName=lastName);
            contacts.add(c);
        }
        system.debug(contacts);
        return contacts;
    }
}

```

RestrictContactByName:

```

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');
        }
    }

}

```

SampleDataController:

```

public with sharing class SampleDataController {
    @AuraEnabled
    public static void importSampleData() {
        delete [SELECT Id FROM Case];
        delete [SELECT Id FROM Property__c];
        delete [SELECT Id FROM Broker__c];
        delete [SELECT Id FROM Contact];
    }
}

```

```
insertBrokers();
insertProperties();
insertContacts();
}
```

```
private static void insertBrokers() {
    StaticResource brokersResource = [
        SELECT Id, Body
        FROM StaticResource
        WHERE Name = 'sample_data_brokers'
    ];
    String brokersJSON = brokersResource.body.toString();
    List<Broker__c> brokers = (List<Broker__c>) JSON.deserialize(
        brokersJSON,
        List<Broker__c>.class
    );
    insert brokers;
}
```

```
private static void insertProperties() {
    StaticResource propertiesResource = [
        SELECT Id, Body
        FROM StaticResource
        WHERE Name = 'sample_data_properties'
    ];
    String propertiesJSON = propertiesResource.body.toString();
    List<Property__c> properties = (List<Property__c>) JSON.deserialize(
        propertiesJSON,
        List<Property__c>.class
    );
    randomizeDateListed(properties);
    insert properties;
}
```

```
private static void insertContacts() {
    StaticResource contactsResource = [
        SELECT Id, Body
        FROM StaticResource
        WHERE Name = 'sample_data_contacts'
    ];
}
```

```

String contactsJSON = contactsResource.body.toString();
List<Contact> contacts = (List<Contact>) JSON.deserialize(
    contactsJSON,
    List<Contact>.class
);
insert contacts;
}

private static void randomizeDateListed(List<Property__c> properties) {
    for (Property__c property : properties) {
        property.Date_Listed__c =
            System.today() - Integer.valueOf((Math.random() * 90));
    }
}
}

```

TestPropertyController:

```

@Test
private class TestPropertyController {
    private final static String MOCK_PICTURE_NAME = 'MockPictureName';

    public static void createProperties(Integer amount) {
        List<Property__c> properties = new List<Property__c>();
        for (Integer i = 0; i < amount; i++) {
            properties.add(
                new Property__c(
                    Name = 'Name ' + i,
                    Price__c = 20000,
                    Beds__c = 3,
                    Baths__c = 3
                )
            );
        }
        insert properties;
    }

    static testMethod void testGetPagedPropertyList() {
        TestPropertyController.createProperties(5);
        Test.startTest();
        PagedResult result = PropertyController.getPagedPropertyList(
            "",

```



```

        999999,
        0,
        0,
        10,
        1
    );
    Test.stopTest();
    System.assertEquals(5, result.records.size());
}

```

```

static testMethod void testGetPicturesNoResults() {
    Property__c property = new Property__c(Name = 'Name');
    insert property;

    Test.startTest();
    List<ContentVersion> items = PropertyController.getPictures(
        property.Id
    );
    Test.stopTest();

    System.assertEquals(null, items);
}

```

```

static testMethod void testGetPicturesWithResults() {
    Property__c property = new Property__c(Name = 'Name');
    insert property;

    // Insert mock picture
    ContentVersion picture = new Contentversion();
    picture.Title = MOCK_PICTURE_NAME;
    picture.PathOnClient = 'picture.png';
    picture.Versiondata = EncodingUtil.base64Decode('MockValue');
    insert picture;

    // Link picture to property record
    List<ContentDocument> documents = [
        SELECT Id, Title, LatestPublishedVersionId
        FROM ContentDocument
        LIMIT 1
    ];
    ContentDocumentLink link = new ContentDocumentLink();
}

```

```

        link.LinkedEntityId = property.Id;
        link.ContentDocumentId = documents[0].Id;
        link.shareType = 'V';
        insert link;

        Test.startTest();
        List<ContentVersion> items = PropertyController.getPictures(
            property.Id
        );
        Test.stopTest();

        System.assertEquals(1, items.size());
        System.assertEquals(MOCK_PICTURE_NAME, items[0].Title);
    }
}

```

TestRestrictContactByName:

```

@IsTest
public class TestRestrictContactByName {
    @IsTest static void createBadContact(){

        Contact c=new Contact(Firstname='John',LastName='INVALIDNAME');

        Test.startTest();
        Database.SaveResult result = Database.insert(c, false);
        Test.stopTest();

        System.assert(!result.isSuccess());
    }
}

```

TestSampleDataController:

```

@isTest
private class TestSampleDataController {
    @isTest
    static void importSampleData() {
        Test.startTest();
        SampleDataController.importSampleData();
        Test.stopTest();
    }
}

```

```

Integer propertyNumber = [SELECT COUNT() FROM Property__c];
Integer brokerNumber = [SELECT COUNT() FROM Broker__c];
Integer contactNumber = [SELECT COUNT() FROM Contact];

System.assert(propertyNumber > 0, 'Expected properties were created.');
```

TestVerifyDate:

```

@IsTest
public class TestVerifyDate {
    @isTest static void dateWithin() {
        Date returnDate1 = verifyDate.CheckDates(date.valueOf('2020-02-14'), date.valueOf('2020-02-24'));
        System.assertEquals(date.valueOf('2020-02-24'), returnDate1);
    }

    @isTest static void dateNotWithin() {
        Date returnDate2 = verifyDate.CheckDates(date.valueOf('2020-02-14'), date.valueOf('2020-03-24'));
        System.assertEquals(date.valueOf('2020-02-29'), returnDate2);
    }
}

```

VerifyDate:

```

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
@TestVisible 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
@TestVisible private static Date SetEndOfMonthDate(Date date1) {
    Integer totalDays = Date.daysInMonth(date1.year(), date1.month());
    Date lastDay = Date.newInstance(date1.year(), date1.month(), totalDays);
    return lastDay;
}
}

```

WarehouseCalloutService:

```

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');
    }

}

```

WarehouseCalloutServiceMock:

```

@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":"55d66226726b611
100aaf742","replacement":true,"quantity":183,"name":"Cooling
Fan","maintenanceperiod":0,"lifespan":0,"cost":300,"sku":"100004"},{"_id":"55d66226726b611100a
af743","replacement":true,"quantity":143,"name":"Fuse
20A","maintenanceperiod":0,"lifespan":0,"cost":22,"sku":"100005"}]');
        response.setStatusCode(200);

        return response;
    }
}

```

WarehouseCalloutServiceTest:

```

@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);
}
}

```

WarehouseSyncSchedule:

```

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

```

WarehouseSyncScheduleTest:

```

@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();
    }
}

```