Apex Specialist-Superbadge (Codes):

Apex Trigger (Module)

Get Started with Apex

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;
}
}
}
```

Bulk Apex Trigger

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;
}
}
```

Apex Testing (Module)

Get started with Apex Unit Test

VerifyDate

```
public class VerifyDate {
	public static Date CheckDates(Date date1, Date date2) {
		if(DateWithin30Days(date1,date2)) {
			return date2;
		} else {
			return SetEndOfMonthDate(date1);
		}
	}

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

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

	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

```
@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);
    }
}
```

Test Apex Trigger

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');
		}
	}
}
```

TestRestrictContactByName

```
@isTest
private class TestRestrictContactByName {
   @isTest static void testInvalidName() {
      //try inserting a Contact with INVALIDNAME
      Contact myConact = new Contact(LastName='INVALIDNAME');
      insert myConact;

      // Perform test
      Test.startTest();
      Database.SaveResult result = Database.insert(myConact, false);
      Test.stopTest();
      // Verify
      // In this case the creation should have been stopped by the trigger,
      // so verify that we got back an error.
      System.assert(!result.isSuccess());
      System.assert(result.getErrors().size() > 0);
      System.assertEquals('Cannot create contact with invalid last name.',
                           result.getErrors()[0].getMessage());
```

```
    }
}
```

Create Test Data For Apex Tests

RandomContactFactory

```
public class RandomContactFactory {
    public static List<Contact> generateRandomContacts(Integer
numContactsToGenerate, String FName) {
        List<Contact> contactList = new List<Contact>();

        for(Integer i=0;i<numContactsToGenerate;i++) {
            Contact c = new Contact(FirstName=FName + ' ' + i, LastName = 'Contact '+i);
            contactList.add(c);
            System.debug(c);
        }
        //insert contactList;
        System.debug(contactList.size());
        return contactList;
    }

}public class RandomContactFactory {
    public static List<Contact> generateRandomContacts(Integer
numContactsToGenerate, String FName) {
        List<Contact> contactList = new List<Contact>();

        for(Integer i=0;i<numContactsToGenerate;i++) {
            Contact c = new Contact(FirstName=FName + ' ' + i, LastName = 'Contact '+i);
            contactList.add(c);
            System.debug(c);
        }
        //insert contactList;
        System.debug(contactList.size());
        return contactList;
    }
```

}

Asynchronous Apex (Module)

Use Future Methods Unit

AccountProcessor

```
public class AccountProcessor
{
  @future
  public static void countContacts(List<Id> accountIds)
  {
     List<Account> accountToUpdate=new List<Account>();
     List<Account> account = [select id,Number_Of_Contacts__c, (select id from
contacts ) from Account Where id in :accountIds];
     For( Account acc:account)
     {
        acc.Number_Of_Contacts__c=acc.Contacts.size();
     }
     update account;
  }
}
```

AccountProcessorTest

```
@isTest
public class AccountProcessorTest {
   public static testmethod void testAccountProcessor(){
      Account a=new Account();
      a.Name = 'Test Account';
      insert a;

      Contact con = new Contact();
      con.FirstName='Binary';
```

```
        con.LastName='Programming';
        con.AccountId=a.Id;
        insert con;

        List<Id> accListId=new List<Id>();
        accListId.add(a.Id);
        Test.startTest();
        AccountProcessor.countContacts(accListId);
        Test.stopTest();
        Account acc=[Select Number_Of_Contacts__c from Account where Id=:a.Id];
        System.assertEquals(Integer.valueOf(acc.Number_Of_Contacts__c),1);
    }
}
```

Use Batch Apex Unit

LeadProcessor

```
global class LeadProcessor implements Database.Batchable<sObject> {
    global Integer count=0;
    global Database.QueryLocator start(Database.BatchableContext bc){
        return Database.getQueryLocator('SELECT ID,LeadSource FROM Lead');
    }
    global void execute(Database.BatchableContext bc,List<Lead> L_list){
        List<lead> L_list_new=new List<lead>();
        for(lead L:L_list){
            L.leadsource='Dreamforce';
            L_list_new.add(L);
            count+=1;
        }
        update L_list_new;
    }
    global void finish(Database.BatchableContext bc){
        system.debug('count= '+count);
    }
}
```

LeadProcessorTest

```
@isTest
public class LeadProcessorTest {
   @isTest
   public static void testit(){
      List<lead> L_list=new List<lead>();
      for(Integer i=0;i<200;i++){
         Lead L=new lead();
         L.LastName='name'+i;
         L.Company='Company';
         L.Status='Random status';
         L_list.add(L);
      }
      insert L_list;
      Test.startTest();
      LeadProcessor lp=new LeadProcessor();
      Id batchId=Database.executeBatch(lp);
      Test.stopTest();
   }
}
```

Schedule Jobs Using the Apex Scheduler

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{
//Seconds Minutes Hours Day_of_month Month Day_of_week optional_year
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 - Not Contacted');
leads.add(lead);
}

insert leads;

Test.startTest();
// Schedule the test job
String jobId = System.schedule('Update LeadSource to DreamForce', CRON_EXP,
new DailyLeadProcessor());

// Stopping the test will run the job synchronously
Test.stopTest();
}
}
```

Control Processes with Queueable Apex

AddPrimaryContact

```
public class AddPrimaryContact implements Queueable {
   private Contact con;
   private String state;
   public AddPrimaryContact(Contact con,String state){
      this.con=con;
      this.state=state;
   }
   public void execute(QueueableContext context){
      List<Account> accounts=[Select Id,Name,(Select FirstName,LastName,Id from
contacts)
                              from Account where BillingState= :state Limit 200];
      List<Contact> primaryContacts = new List<Contact>();
      for(Account acc:accounts){
         Contact c=con.clone();
         c.AccountId=acc.Id;
         primaryContacts.add(c);
      }
      if(primaryContacts.size()>0){
         insert primaryContacts;
      }
   }

}
```

AddPrimaryContactTest

```
@isTest
public class AddPrimaryContactTest {
   static testmethod void testQueueable(){
      List<Account> testAccounts=new List<Account>();
      for(Integer i=0;i<50;i++){
         testAccounts.add(new Account(Name='Account' +i,BillingState='CA'));
      }
       for(Integer j=0;j<50;j++){
```

```
        testAccounts.add(new Account(Name='Account' +j,BillingState='NY'));
    }
    insert testAccounts;
    Contact testContact = new Contact(FirstName='John',LastName='Doe');
    insert testContact;
    AddPrimaryContact addit=new addPrimaryContact(testContact,'CA');
    Test.startTest();
    system.enqueueJob(addit);
    Test.stopTest();
    system.assertEquals(50,[Select count() from Contact where accountId in (Select
Id from Account where BillingState='CA')]);
  }
}
```

Apex Integration Services (Module)

Apex REST Callouts

AnimalLocator

```
public class AnimalLocator
{

  public static String getAnimalNameById(Integer id)
   {
      Http http = new Http();
      HttpRequest request = new HttpRequest();
      request.setEndpoint('https://th-apex-http-callout.herokuapp.com/animals/'+id);
      request.setMethod('GET');
      HttpResponse response = http.send(request);
        String strResp = '';
         system.debug('******response '+response.getStatusCode());
         system.debug('******response '+response.getBody());
      // 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
        Map<string,object> animals = (map<string,object>) results.get('animal');
        System.debug('Received the following animals:' + animals );
        strResp = string.valueof(animals.get('name'));
        System.debug('strResp >>>>>>' + strResp );
      }
      return strResp ;
  }

}
```

AnimalLocatorTest

```
@isTest
private class AnimalLocatorTest{
   @isTest static  void AnimalLocatorMock1() {
      Test.SetMock(HttpCallOutMock.class, new AnimalLocatorMock());
      String response=AnimalLocator.getAnimalNameById(1);
      System.assertEquals('chicken', response);
   }
}
```

Apex SOAP Callouts

parksServices

```
//Generated by wsdl2apex

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

```
        private String[] field_order_type_info = new String[]{'return_x'};
    }
    public class byCountry {
        public String arg0;
        private String[] arg0_type_info = new
String[]{'arg0','http://parks.services/',null,'0','1','false'};
        private String[] apex_schema_type_info = new
String[]{'http://parks.services/','false','false'};
        private String[] field_order_type_info = new String[]{'arg0'};
    }
    public class ParksImplPort {
        public String endpoint_x = 'https://th-apex-soap-
service.herokuapp.com/service/parks';
        public Map<String,String> inputHttpHeaders_x;
        public Map<String,String> outputHttpHeaders_x;
        public String clientCertName_x;
        public String clientCert_x;
        public String clientCertPasswd_x;
        public Integer timeout_x;
        private String[] ns_map_type_info = new String[]{'http://parks.services/',
'ParkService'};
        public String[] byCountry(String arg0) {
            ParkService.byCountry request_x = new ParkService.byCountry();
            request_x.arg0 = arg0;
            ParkService.byCountryResponse response_x;
            Map<String, ParkService.byCountryResponse> response_map_x = new
Map<String, ParkService.byCountryResponse>();
            response_map_x.put('response_x', response_x);
            WebServiceCallout.invoke(
              this,
              request_x,
              response_map_x,
              new String[]{endpoint_x,
              '',
              'http://parks.services/',
              'byCountry',
              'http://parks.services/',
```

```
            'byCountryResponse',
            'ParkService.byCountryResponse'}
          );
          response_x = response_map_x.get('response_x');
          return response_x.return_x;
      }
   }
}
```

ParkLocator

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

ParkLocatorTest

```
@isTest
public class ParkLocatorTest {
@isTest static void testMock(){
      test.setMock(WebserviceMock.class, new ParkServiceMock());
      String[] parksName = ParkLocator.Country('India');
      List<String> country = new List<String>();
         country.add('Inamdar National Park');
            country.add('Riza National Park');
            country.add('Shilpa National Park');
      System.assertEquals(country, parksName, 'park names are not as expected');
   }

}
```

Apex Web Services

AccountManager

```
@RestResource (urlMapping = '/Account/*/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.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;
    }

}
```