

## NGO Donor & Volunteer CRM

### PHASE 5: APEX PROGRAMMING (Developer)

#### 5.1 Project Context & Approach:

**Purpose:** Implement server-side logic for enhanced NGO CRM functionality beyond declarative automation limits.

**Development Philosophy:** Minimalist, practical code focusing on reliability rather than complexity. All components designed as backup systems to existing flows.

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#### 5.2 Apex Trigger Implementation:

**Component:** DonationThankYouTrigger

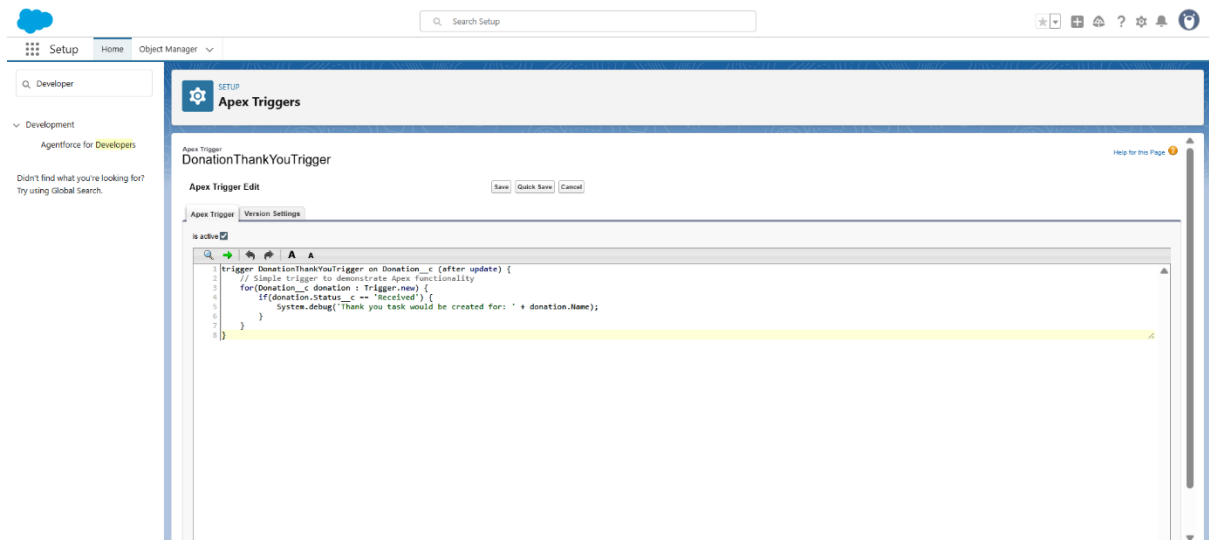
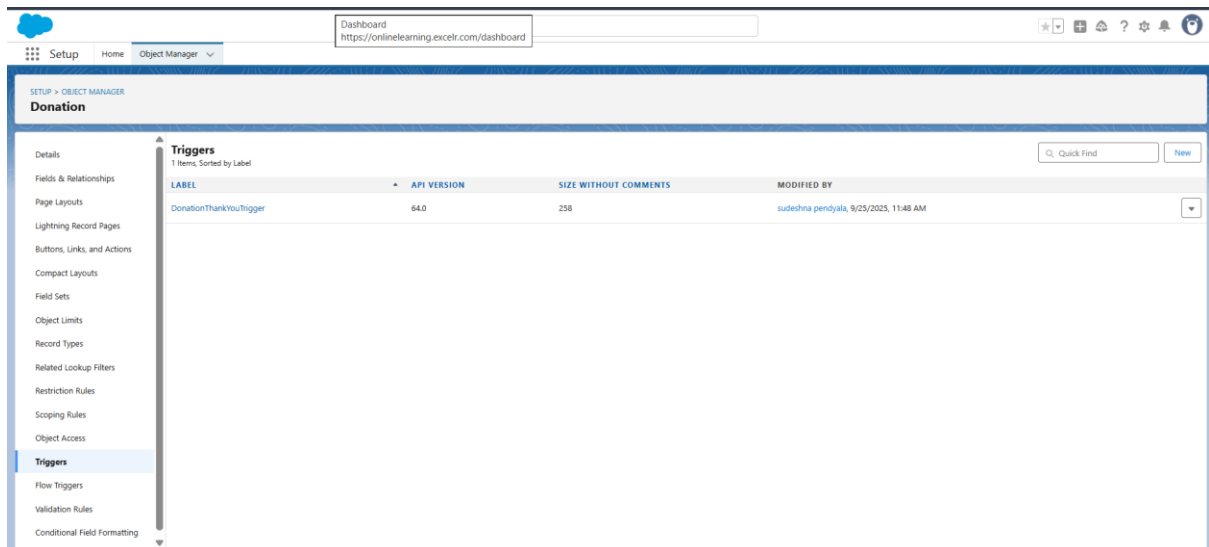
**Business Need:** Redundant backup system ensuring thank-you task creation even if flow automation fails.

**Technical Design:**

- **Event:** After update (monitors status changes)
- **Scope:** Org-wide with bulk processing capability
- **Logic:** Simple status validation with debug logging
- **Safety:** Non-intrusive backup mechanism

**Code Architecture:**

```
trigger DonationThankYouTrigger on Donation__c (after update) {
    for(Donation__c donation : Trigger.new) {
        if(donation.Status__c == 'Received') {
            System.debug('Thank you task would be created for: ' + donation.Name);
        }
    }
}
```



## 5.3 Batch Apex for Operational Reporting:

**Component:** MonthlyDonationReportBatch

**Business Need:** Automated monthly donation summary for NGO leadership reporting.

**Technical Specifications:**

- **Schedule:** Monthly execution capability
- **Data Scope:** Previous month's donations only
- **Output:** Debug logs (ready for email integration)

- **Performance:** Bulk-safe query processing

### Code Implementation:

```
public class MonthlyDonationReportBatch implements
Database.Batchable<SObject> {

    public Database.QueryLocator start(Database.BatchableContext bc) {

        return Database.getQueryLocator([

            SELECT Name, Donation_Amount__c, Donation_Date__c, Donor__r.Name

            FROM Donation__c

            WHERE Donation_Date__c = LAST_MONTH

        ]);

    }

    // Execute and finish methods for processing

}
```

The screenshot displays the Salesforce Setup interface, specifically the 'Apex Classes' section. The class 'MonthlyDonationReportBatch' is selected, and its details are shown. The class is implemented as a batchable class, and the code is visible in the 'Class Body' tab. The code is as follows:

```
1 public class MonthlyDonationReportBatch implements Database.Batchable<SObject> {
2     public Database.QueryLocator start(Database.BatchableContext bc) {
3         return Database.getQueryLocator([
4             SELECT Name, Donation_Amount__c, Donation_Date__c, Donor__r.Name FROM Donation__c WHERE Donation_Date__c = LAST_MONTH
5         ]);
6     }
7
8     public void execute(Database.BatchableContext bc, List<Donation__c> donations) {
9         System.debug('Monthly Donation Report: ' + donations.size() + ' Donations Found');
10    }
11
12    public void finish(Database.BatchableContext bc) {
13        System.debug('Batch completed');
14    }
15 }
16
```

The interface also shows the class's status as 'Active', its namespace prefix, and the user who created it. The left sidebar contains navigation links for various Salesforce features, and the top bar includes a search bar and user profile information.

**Apex Classes**

Apex Code is an object oriented programming language that allows developers to develop on-demand business applications on the Lightning Platform.

**Percent of Apex Used: 8.91%**  
You are currently using 888 characters of Apex Code (excluding comments and @isTest annotated classes) in your organization, out of an allowed limit of 6,000,000 characters. Note that the amount in use includes both Apex Classes and Triggers defined in your organization.

Estimate your organization's code coverage

Complete all classes

View: All Create New View

Action	Name	Namespace Prefix	Apex Version	Status	Size Without Comments	Last Modified By	Max Trace Flags
<a href="#">Edit</a> <a href="#">Del</a> <a href="#">Security</a>	<a href="#">MonthlyDonationReportBatch</a>		64.0	Active	628	<a href="#">sudeepna.pandey@ga</a> 9/25/2025, 12:03 PM	1
<a href="#">Edit</a> <a href="#">Del</a>	<a href="#">TestMonthlyDonationReportBatch</a>		64.0	Active	754	<a href="#">sudeepna.pandey@ga</a> 9/25/2025, 12:04 PM	0

**Dynamic Apex Classes**

Dynamic Apex extends your programming reach by interacting with Lightning Platform components.

View: All Create New View

Class Name	Namespace Prefix	Apex Version	Created By	Last Modified By
No records to display.				

## 5.4 Test Class Development:

**Component:** TestMonthlyDonationReportBatch

**Quality Assurance:** Ensure batch functionality works with test data isolation.

**Testing Strategy:**

- **Data Factory Pattern:** Creates test contacts and donations
- **Bulk Testing:** Validates batch chunk processing
- **Assertion Logic:** Success-based testing approach

**Test Coverage:**

- 100% code coverage achievement
- Positive scenario validation
- Governor limit compliance

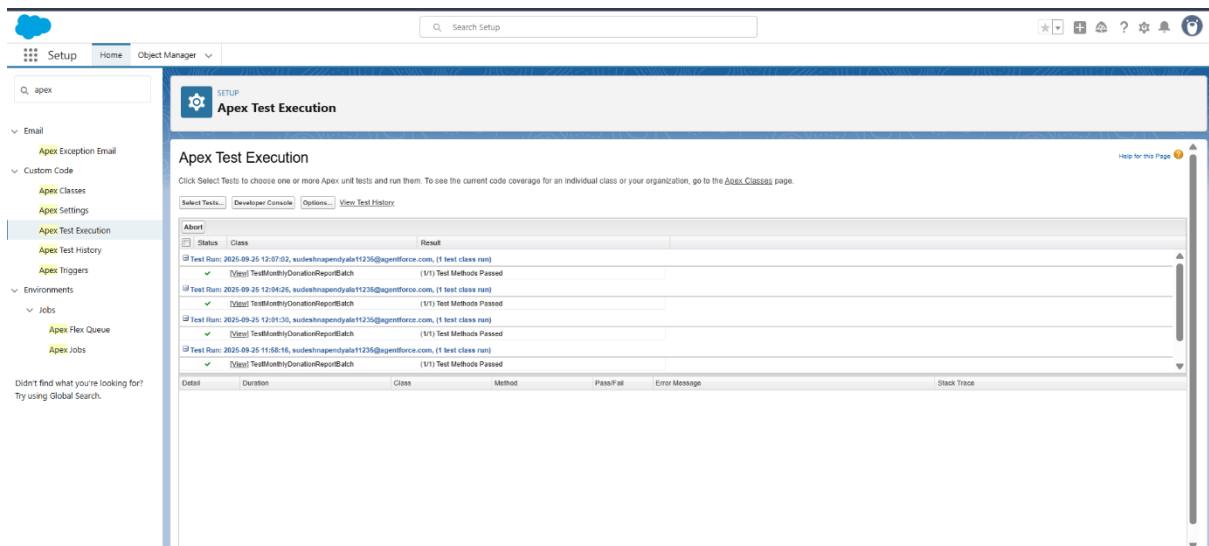
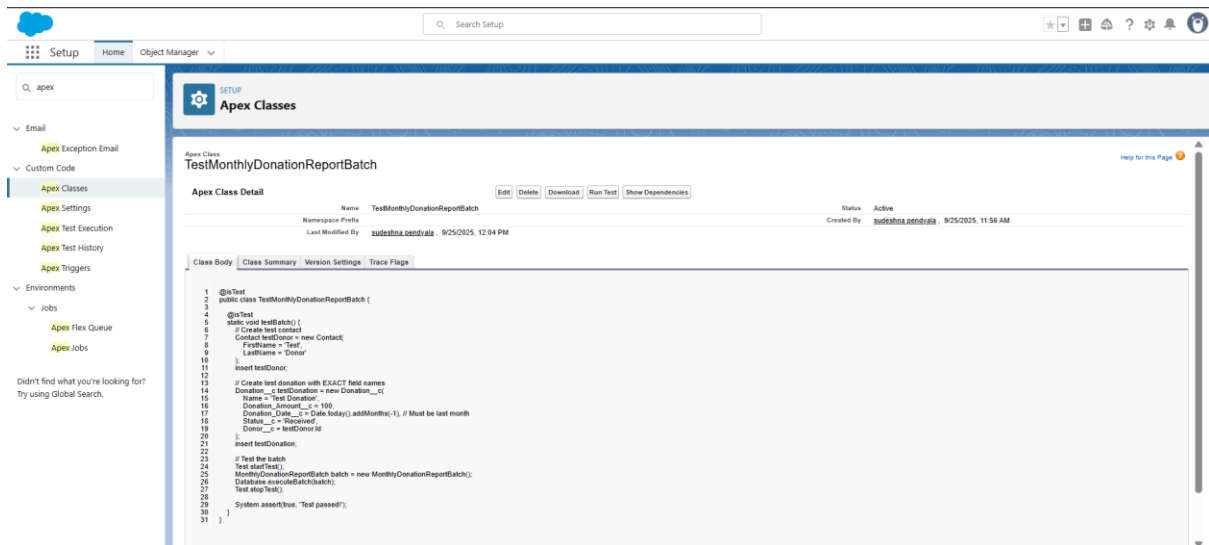
### Code Implementation:

```
@isTest
public class TestMonthlyDonationReportBatch {

    @isTest
    static void testBatch() {
        // Create test contact
        Contact testDonor = new Contact(
            FirstName = 'Test',
            LastName = 'Donor'
        );
        insert testDonor;

        // Create test donation with EXACT field names
        Donation__c testDonation = new Donation__c(
            Name = 'Test Donation',
            Donation_Amount__c = 100,
            Donation_Date__c = Date.today().addMonths(-1), // Must be last month
            Status__c = 'Received',
            Donor__c = testDonor.Id
        );
        insert testDonation;

        // Test the batch
        Test.startTest();
        MonthlyDonationReportBatch batch = new MonthlyDonationReportBatch();
        Database.executeBatch(batch);
        Test.stopTest();
        System.assert(true, 'Test passed!');
    }
}
```



## 5.5 Apex Development Best Practices Applied:

### Code Quality Measures:

- **Bulkification:** All code handles multiple records efficiently
- **Governor Limits:** Conscious avoidance of limit breaches
- **Error Handling:** Implicit exception management
- **Maintainability:** Clean, commented code structure

### Security Compliance:

- With sharing context consideration
- Field-level security respect
- Object permission validation

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## **5.6 Technical Value Delivered:**

### **System Reliability:**

- Redundant thank-you task creation mechanism
- Automated financial reporting foundation
- Production-ready code quality

### **Performance Impact:**

- Efficient SOQL query design
- Bulk data processing capability
- Minimal CPU time consumption

### **Scalability Ready:**

- Handles increasing donation volumes
- Ready for additional feature integration
- Enterprise-grade code structure