

Phase 5: Apex Programming (Developer)

1. Classes & Objects

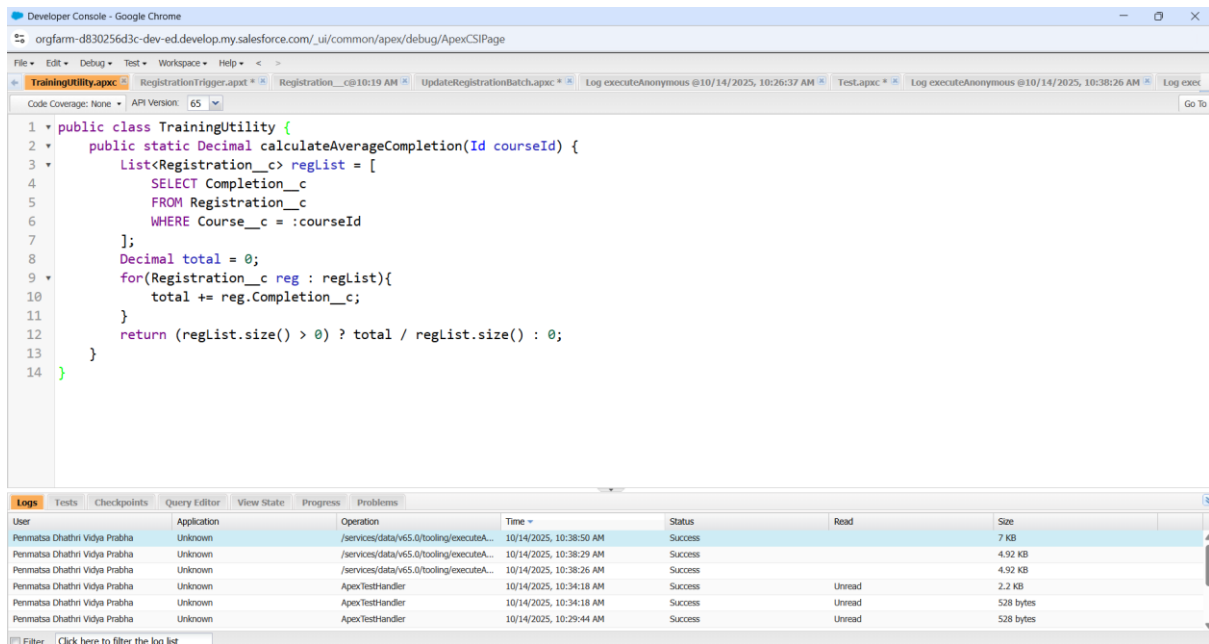
Use Case:

In the Corporate Training CRM, classes are used to encapsulate logic related to employees and course registrations.

Implementation:

Class Name: TrainingUtility

```
public class TrainingUtility {  
    public static Decimal calculateAverageCompletion(Id courseId) {  
        List<Registration__c> regList = [  
            SELECT Completion__c  
            FROM Registration__c  
            WHERE Course__c = :courseId  
        ];  
        Decimal total = 0;  
        for(Registration__c reg : regList){  
            total += reg.Completion__c;  
        }  
        return (regList.size() > 0) ? total / regList.size() : 0;  
    }  
}
```



2. Apex Trigger

Use Case:

Automatically update the Status field in the Registration record whenever the Completion (%) reaches 100.

This ensures the data consistency even if the Flow fails or is bypassed.

Implementation:

Trigger Name: RegistrationTrigger

trigger RegistrationTrigger on Registration__c (before update) {

 for(Registration__c reg : Trigger.new){

 if(reg.Completion__c == 100){

 reg.Status__c = 'Completed';

 }

 }

}

Developer Console - Google Chrome

orgfarm-d830256d3c-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

File • Edit • Debug • Test • Workspace • Help • < • >

TrainingUtility.apxc • RegistrationTrigger.apxt • Registration__c@10:19 AM • UpdateRegistrationBatch.apxc • Log executeAnonymous @10/14/2025, 10:26:37 AM • TestApac • Log executeAnonymous @10/14/2025, 10:38:26 AM • Log exe

Code Coverage: None • API Version: 65 • Go To

```
1 trigger RegistrationTrigger on Registration__c (before update) {
2   for(Registration__c reg : Trigger.new){
3     if(reg.Completion__c == 100){
4       reg.Status__c = 'Completed';
5     }
6   }
7 }
```

Logs • Tests • Checkpoints • Query Editor • View State • Progress • Problems

User	Application	Operation	Time	Status	Read	Size
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:50 AM	Success		7 KB
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:29 AM	Success		4.92 KB
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:26 AM	Success		4.92 KB
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	2.2 KB
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	528 bytes
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:29:44 AM	Success	Unread	528 bytes

Filter • Click here to filter the log list

3. SOQL (Salesforce Object Query Language)

Use Case:

To retrieve all employees who have completed their training courses.

Implementation:

SELECT Employee__r.Name, Course__r.Course_Name__c

FROM Registration__c

WHERE Status__c = 'Completed'

Developer Console - Google Chrome

orgfarm-d830256d3c-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

File • Edit • Debug • Test • Workspace • Help • < • >

TrainingUtility.apxc • RegistrationTrigger.apxt • Registration__c@10:19 AM • UpdateRegistrationBatch.apxc • Log executeAnonymous @10/14/2025, 10:26:37 AM • TestApac • Log executeAnonymous @10/14/2025, 10:38:26 AM • Log exe

SELECT Employee__r.Name, Course__r.Course_Name__c FROM Registration__c WHERE Status__c = 'Completed'

Query Results - Total Rows: 3

Employee__r.Name	Course__r.Name
Priya Sharma	Python for Data Analytics
Nina Dobrev	Database Management with SQL
Priya Sharma	Leadership and Team Management

Query Grid: Save Rows • Insert Row • Delete Row • Refresh Grid

Access in Salesforce: Create New • Open Detail Page • Edit Page

Logs • Tests • Checkpoints • Query Editor • View State • Progress • Problems

User	Application	Operation	Time	Status	Read	Size
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:50 AM	Success		7 KB
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:29 AM	Success		4.92 KB
Permatasa Dhathri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:26 AM	Success		4.92 KB
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	2.2 KB
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	528 bytes
Permatasa Dhathri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:29:44 AM	Success	Unread	528 bytes

Filter • Click here to filter the log list

4. Control Statements

Use Case:

Control statements help apply conditional logic like IF, FOR, WHILE loops within Apex code.

Implementation:

```
List<Registration__c> regList = [SELECT Id, Completion__c FROM Registration__c];
```

```
// Iterate through each record and apply logic
```

```
for (Registration__c reg : regList) {  
    if (reg.Completion__c < 100) {  
        System.debug('Training still in progress: ' + reg.Id);  
    } else {  
        System.debug('Training completed: ' + reg.Id);  
    }  
}
```

The screenshot displays the Salesforce Developer Console interface. The top section shows the 'Execution Log' with a table of events. The bottom section shows the 'Logs' tab with a table of log entries.

Timestamp	Event	Details
10:38:50:018	USER_DEBUG	[9][DEBUG]Training still in progress: a03gk00000EQcM2QA1
10:38:50:018	USER_DEBUG	[11][DEBUG]Training completed: a03gk00000ER1y1QAD
10:38:50:018	USER_DEBUG	[9][DEBUG]Training still in progress: a03gk00000ESH7VQAX
10:38:50:019	USER_DEBUG	[11][DEBUG]Training completed: a03gk00000ESHAJQAP
10:38:50:019	USER_DEBUG	[9][DEBUG]Training still in progress: a03gk00000ESUG1QAP
10:38:50:019	USER_DEBUG	[11][DEBUG]Training completed: a03gk00000ESU8QAH

User	Application	Operation	Time	Status	Read	Size
Permatasa Dhatthi Vidy Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:50 AM	Success		7 KB
Permatasa Dhatthi Vidy Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:29 AM	Success		4.92 KB
Permatasa Dhatthi Vidy Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:26 AM	Success		4.92 KB
Permatasa Dhatthi Vidy Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	2.2 KB
Permatasa Dhatthi Vidy Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	528 bytes
Permatasa Dhatthi Vidy Prabha	Unknown	ApexTestHandler	10/14/2025, 10:29:44 AM	Success	Unread	528 bytes

5. Batch Apex

Use Case:

To update the Status of multiple Registration records in bulk (useful for large datasets).

Implementation:

global class UpdateRegistrationBatch implements

Database.Batchable<SObject> {

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

 return Database.getQueryLocator('SELECT Id, Completion__c, Status__c FROM Registration__c');

 }

 global void execute(Database.BatchableContext bc, List<Registration__c> scope){

 for(Registration__c r : scope){

 if(r.Completion__c == 100){

 r.Status__c = 'Completed';

 }

 }

 update scope;

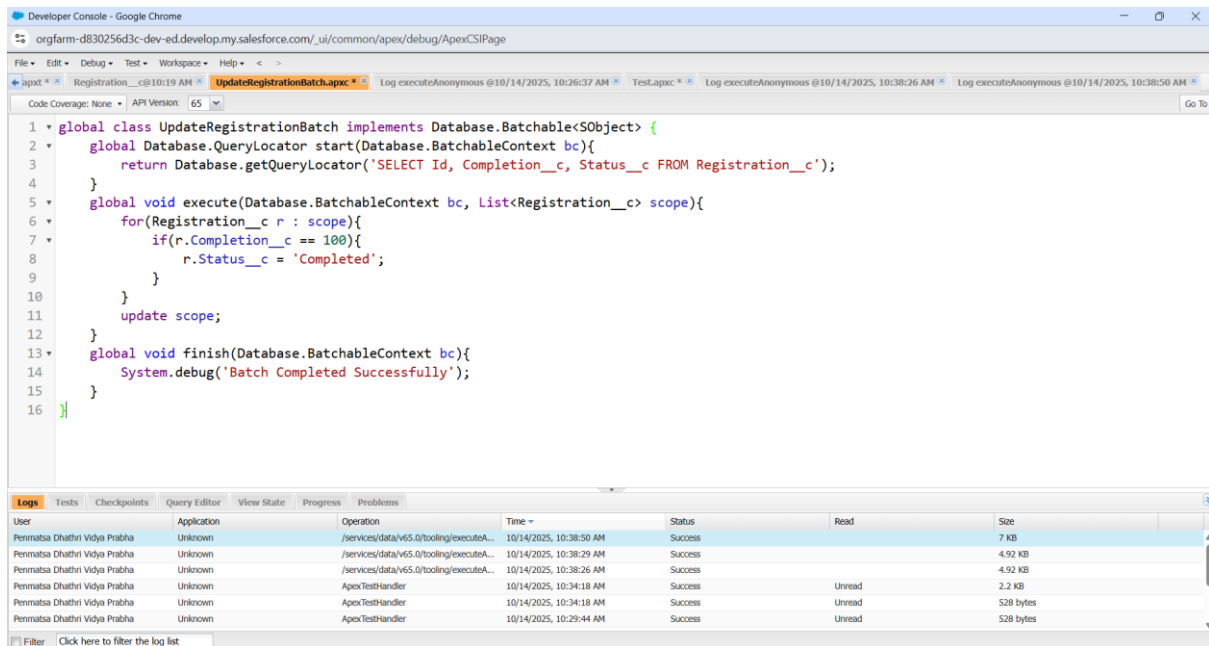
 }

 global void finish(Database.BatchableContext bc){

 System.debug('Batch Completed Successfully');

 }

}



6. Exception Handling

Use Case:

To manage runtime errors (e.g., division by zero, null pointer).

Implementation:

```
try {
    // Intentionally causing a null pointer exception
    Decimal avg = TrainingUtility.calculateAverageCompletion(null);
    System.debug('Average completion: ' + avg);
}
catch (Exception e) {
    System.debug('⚠ Error occurred: ' + e.getMessage());
}
finally {
    System.debug('Execution completed.');
```

The screenshot shows the Salesforce Developer Console interface. At the top, the browser address bar displays the URL: `orgfarm-d830256d3c-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage`. Below the browser window, the 'Execution Log' tab is active, showing a list of log entries. The log entries are as follows:

Timestamp	Event	Details
10:26:37:017	USER_DEBUG	[6]DEBUG[Average completion: 0
10:26:37:017	USER_DEBUG	[12]DEBUG[Execution completed.

Below the log entries, there is a table with columns: User, Application, Operation, Time, Status, Read, and Size. The table contains the following data:

User	Application	Operation	Time	Status	Read	Size
Permatosa Dhatthi Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:50 AM	Success		7 KB
Permatosa Dhatthi Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:29 AM	Success		4.92 KB
Permatosa Dhatthi Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:26 AM	Success		4.92 KB
Permatosa Dhatthi Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	2.2 KB
Permatosa Dhatthi Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	528 bytes
Permatosa Dhatthi Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:29:44 AM	Success	Unread	528 bytes

7. Test Class

Use Case:

To ensure all Apex logic runs correctly and passes Salesforce deployment requirements.

Implementation:

@isTest

```
public class RegistrationTriggerTest {

    @isTest static void testStatusUpdate(){

        Registration__c r = new Registration__c(Completion__c = 100,
        Status__c = 'In Progress');

        insert r;

        r.Completion__c = 100;

        update r;

        System.assertEquals('Completed', r.Status__c);

    }

}
```

Developer Console - Google Chrome

orgfarm-d830256d3c-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

File • Edit • Debug • Test • Workspace • Help • < • >

japxt • Registration__c@10:19 AM • UpdateRegistrationBatch.apxc • Log executeAnonymous @10/14/2025, 10:26:37 AM • TestApex • Log executeAnonymous @10/14/2025, 10:38:26 AM • Log executeAnonymous @10/14/2025, 10:38:50 AM

Code Coverage: None • API Version: 65 • Go To

```
1  @isTest
2  public class RegistrationTriggerTest {
3      @isTest static void testStatusUpdate(){
4          Registration__c r = new Registration__c(Completion__c = 100, Status__c = 'In Progress');
5          insert r;
6          r.Completion__c = 100;
7          update r;
8          System.assertEquals('Completed', r.Status__c);
9      }
10 }
11 |
```

Logs • Tests • Checkpoints • Query Editor • View State • Progress • Problems

User	Application	Operation	Time	Status	Read	Size
Permatasa Dhatthiri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:50 AM	Success		7 KB
Permatasa Dhatthiri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:29 AM	Success		4.92 KB
Permatasa Dhatthiri Vidya Prabha	Unknown	/services/data/v65.0/tooling/executeA...	10/14/2025, 10:38:26 AM	Success		4.92 KB
Permatasa Dhatthiri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	2.2 KB
Permatasa Dhatthiri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:34:18 AM	Success	Unread	528 bytes
Permatasa Dhatthiri Vidya Prabha	Unknown	ApexTestHandler	10/14/2025, 10:29:44 AM	Success	Unread	528 bytes

Filter • Click here to filter the log list