Phase 5 – Apex Programming

PROJECT:- DEEPFAKE CRM

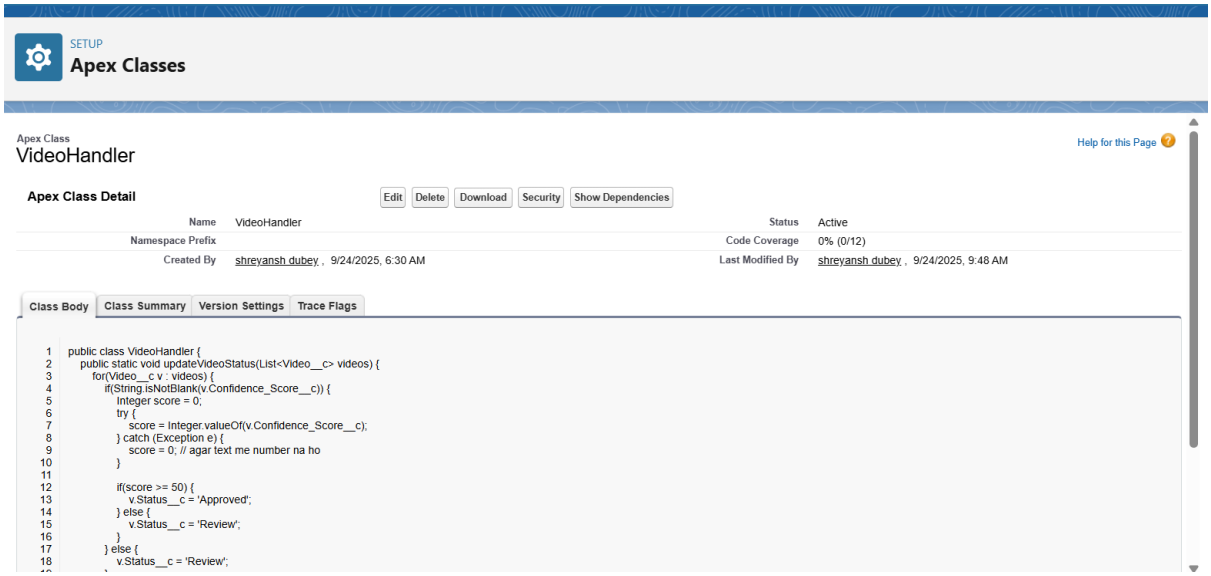
🟦 1. Apex Classes & Objects

Definition: Apex Classes are templates that define **custom business logic**. Objects are Salesforce database tables, and fields are columns.

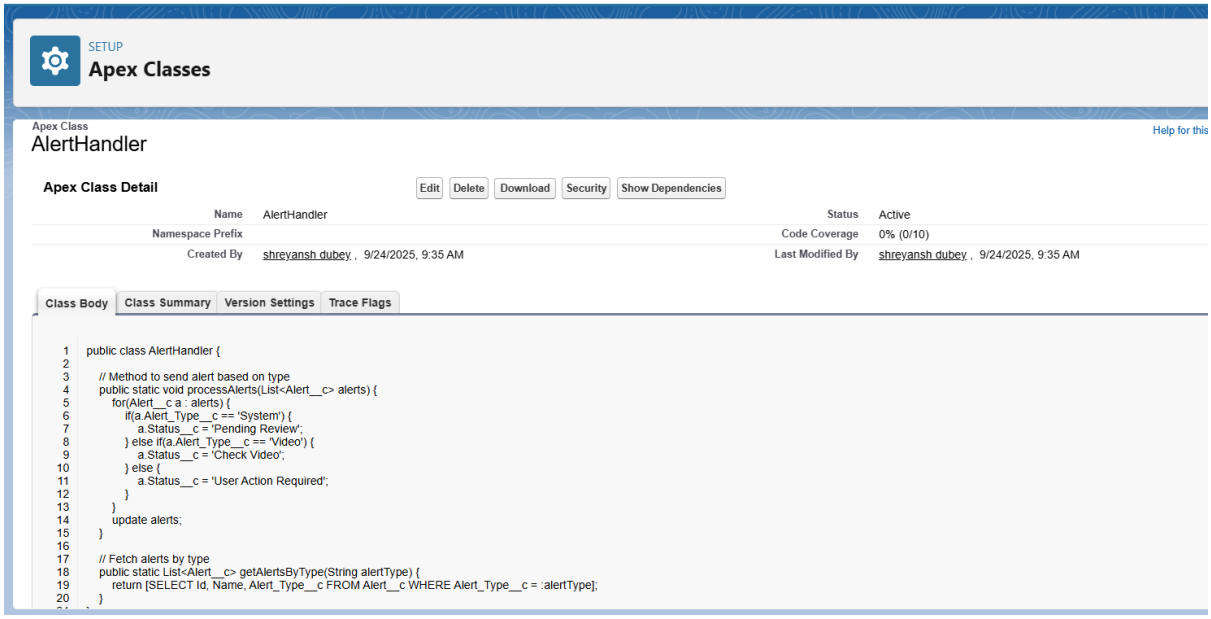
Key Points:

- Classes contain **methods** (functions) and **variables**
- Encapsulate logic → reusable across triggers, Visualforce, Lightning

Video Handler:



Alert Handler:



SETUP
Apex Classes

Apex Class
AlertHandler

Help for this

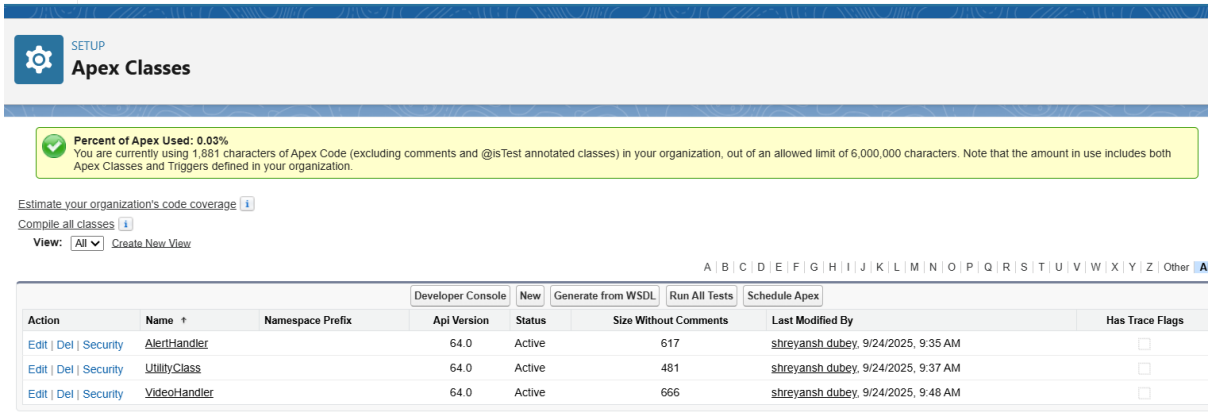
Apex Class Detail Edit | Delete | Download | Security | Show Dependencies

Name	AlertHandler	Status	Active
Namespace Prefix		Code Coverage	0% (0/10)
Created By	shreyansh dubey , 9/24/2025, 9:35 AM	Last Modified By	shreyansh dubey , 9/24/2025, 9:35 AM

Class Body | Class Summary | Version Settings | Trace Flags

```
1  public class AlertHandler {
2
3      // Method to send alert based on type
4      public static void processAlerts(List<Alert__c> alerts) {
5          for(Alert__c a : alerts) {
6              if(a.Alert_Type__c == 'System') {
7                  a.Status__c = 'Pending Review';
8              } else if(a.Alert_Type__c == 'Video') {
9                  a.Status__c = 'Check Video';
10             } else {
11                 a.Status__c = 'User Action Required';
12             }
13         }
14         update alerts;
15     }
16
17     // Fetch alerts by type
18     public static List<Alert__c> getAlertsByType(String alertType) {
19         return [SELECT Id, Name, Alert_Type__c FROM Alert__c WHERE Alert_Type__c = :alertType];
20     }
```

All Apex Classes :



SETUP
Apex Classes

Percent of Apex Used: 0.03%
You are currently using 1,881 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
Compile all classes
View: All | Create New View

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | Other | A

Developer Console | New | Generate from WSDL | Run All Tests | Schedule Apex

Action	Name	Namespace Prefix	Api Version	Status	Size Without Comments	Last Modified By	Has Trace Flags
Edit | Del | Security	AlertHandler		64.0	Active	617	shreyansh dubey, 9/24/2025, 9:35 AM	
Edit | Del | Security	UtilityClass		64.0	Active	481	shreyansh dubey, 9/24/2025, 9:37 AM	
Edit | Del | Security	VideoHandler		64.0	Active	666	shreyansh dubey, 9/24/2025, 9:48 AM	

✅ **Tip:** Always use **bulk-safe** logic – process multiple records using lists.

🟩 2. Apex Triggers

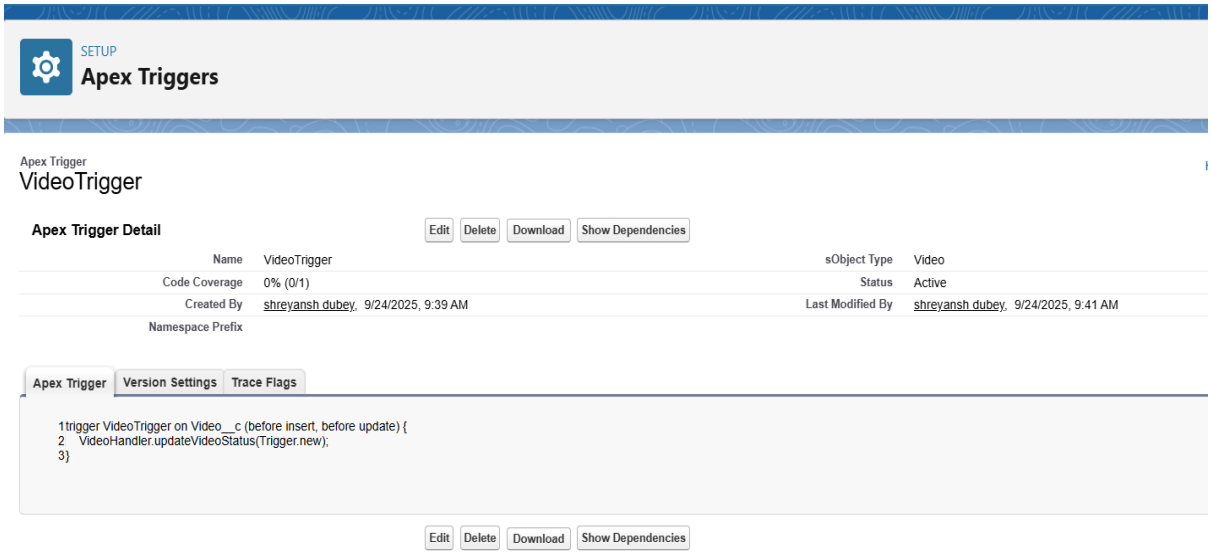
Definition: Triggers automate logic **before or after record events** (insert, update, delete).

Trigger Design Pattern:

- Trigger calls **Handler Class**
- Keeps logic **centralized & maintainable**
- Supports **bulkification**

Video Trigger

```
trigger VideoTrigger on Video__c (before insert, before update) {
   VideoHandler.updateVideoStatus(Trigger.new);
}
```



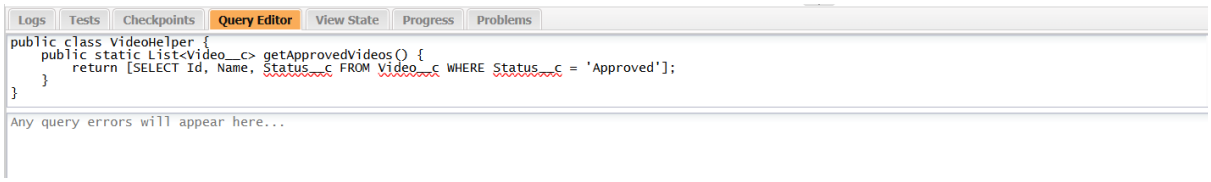
✅ Use **before triggers** to update fields before saving, **after triggers** for related objects.

🟧 3. SOQL & SOSL

SOQL (Salesforce Object Query Language):

- Fetch records from a **single object**
- Can filter, order, and aggregate

```
List<Video__c> approvedVideos = [SELECT Id, Name, Status__c
                                 FROM Video__c
                                 WHERE Status__c = 'Approved'];
```



SOSL (Salesforce Object Search Language):

- Search **text across multiple objects/fields**
- Returns a **list of lists of sObjects**

```
List<List<sObject>> results = [FIND 'Tutorial*' IN ALL FIELDS
                               RETURNING Video__c(Id, Name, Title__c)];
List<Video__c> videosFound = (List<Video__c>)results[0];
```

✅ **Tip:** Use SOSL for **quick text search**, SOQL for **specific field filtering**.

🟪 4. Collections: List, Set, Map

1. List – Ordered, allows duplicates
2. Set – Unique elements, unordered
3. Map – Key-Value pairs, keys unique

Example:

```
List<Video__c> videos = [SELECT Id, Name FROM Video__c];

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

Map<Id, Video__c> videoMap = new Map<Id, Video__c>(videos);
```

✅ Use collections for **bulk-safe triggers** and to **avoid SOQL inside loops**.

🟧 5. Batch Apex

Purpose: Process **large datasets** asynchronously in chunks (batches).

Structure:

1. start → Fetch records
2. execute → Process batch
3. finish → Post-processing

Video Batch Update

```
global class VideoBatchUpdate implements Database.Batchable<SObject> {

    // 1️⃣ Start – Query records
    global Database.QueryLocator start(Database.BatchableContext BC) {
        return Database.getQueryLocator(
            'SELECT Id, Confidence_Score__c, Status__c FROM Video__c'
        );
    }

    // 2️⃣ Execute – Process batch
    global void execute(Database.BatchableContext BC, List<Video__c> scope) {
        for(Video__c v : scope) {
            Integer score = 0;
            try {
                score = Integer.valueOf(v.Confidence_Score__c);
            } catch(Exception e){
                score = 0;
            }
            v.Status__c = (score >= 50) ? 'Approved' : 'Review';
```

Tests | Checkpoints | Query Editor | View State | Progress | Problems

Run:

```
Database.executeBatch(new VideoBatchUpdate(), 200);
```

✅ **Tip:** Batch Apex is essential for **50,000+ records**.

🟦 6. Asynchronous Apex

- **Future Methods:** Run in background

@future

public static void sendEmailAsync(String email) { ... }

- **Queueable Apex:** Supports chaining jobs

public class QueueableExample implements Queueable { ... }

- **Scheduled Apex:** Cron-like scheduling

global class ScheduledJob implements Schedulable { ... }

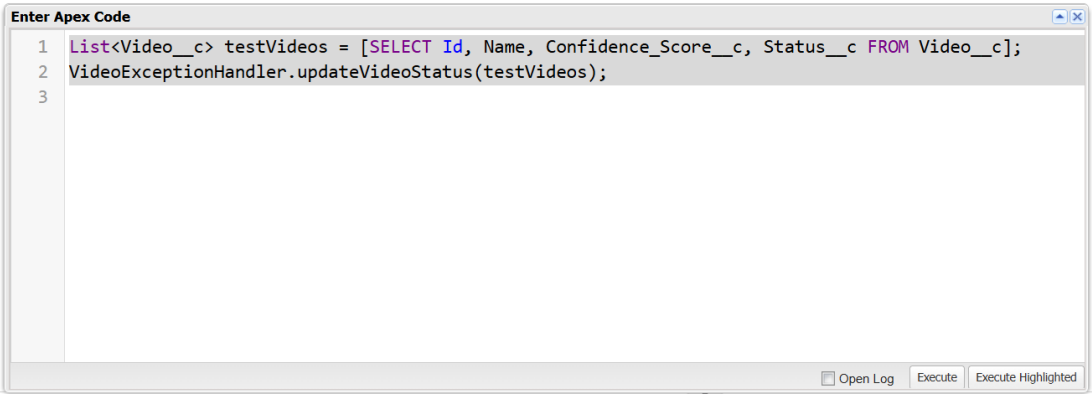
✅ Use async apex for **heavy processing** without hitting governor limits.

🟩 7. Exception Handling

- **Use try-catch to prevent runtime errors**

```
public class VideoExceptionHandler {
    public static void updateVideoStatus(List<Video__c> videos) {
        for(Video__c v : videos){
            try {
                Integer score = Integer.valueOf(v.Confidence_Score__c);
                v.Status__c = (score >= 50) ? 'Approved' : 'Review';
            } catch(Exception e){
                System.debug('Error processing Video: ' + v.Name + ' - ' + e.getMessage());
                v.Status__c = 'Error';
            }
        }
        update videos;
    }
}
```

```
trigger VideoTriggerException on Video__c (before insert, before update) {
    VideoExceptionHandler.updateVideoStatus(Trigger.new);
}
```



✅ Always log errors for debugging.

🟧 8. Test Classes

Purpose: Validate logic, ensure **code coverage ≥75%**

Video Handler Test

```
@IsTest
public class VideoHandlerTest {
    static testMethod void testUpdateVideoStatus() {
        Video__c v1 = new Video__c(Name='V1', Confidence_Score__c='60');
        Video__c v2 = new Video__c(Name='V2', Confidence_Score__c='40');

        Test.startTest();
        insert new List<Video__c>{v1, v2};
        Test.stopTest();

        System.assertEquals('Approved', [SELECT Status__c FROM Video__c WHERE Id=:v1.Id].Status__c);
        System.assertEquals('Review', [SELECT Status__c FROM Video__c WHERE Id=:v2.Id].Status__c);
    }
}
```

Other Test Classes: Alert Helper Test, Utility Class Test (same format)

Overall Code Coverage		
Class	Percent	Lines
Overall	**94%**	17/17
VideoHander	100%	17/17
AlertHander	**77%**	14/18
UtilityClass	**100%**	15/15

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9. Best Practices

- Always **bulkify triggers**
- Avoid SOQL/DML inside loops
- Use **Handler classes** for logic
- Write **robust test classes** with positive/negative scenarios
- Use **Async Apex** for large or delayed processing