Phase 5 – Apex Programming

PROJECT:- DEEPFAKE CRM

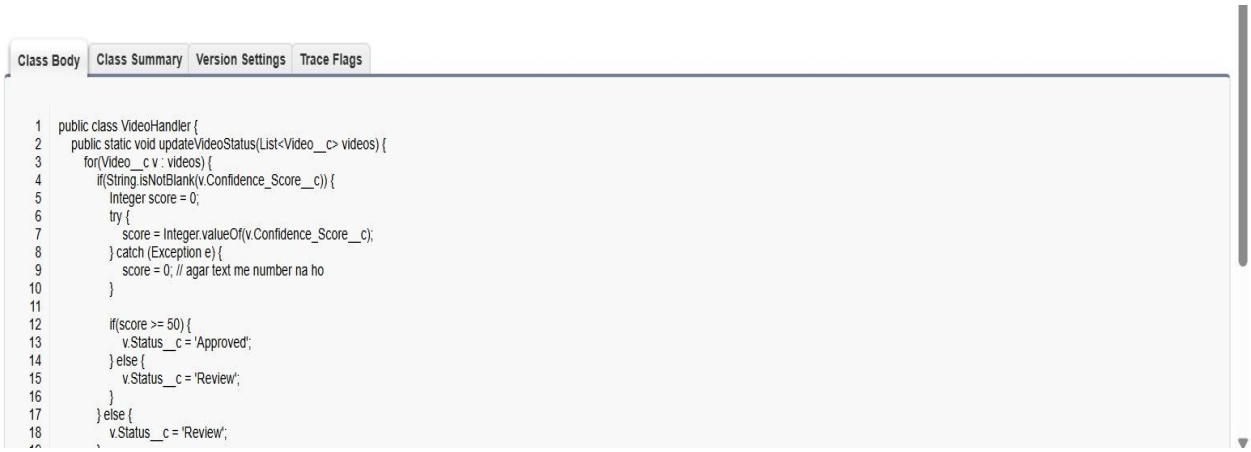
1. Apex Classes & Objects

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:

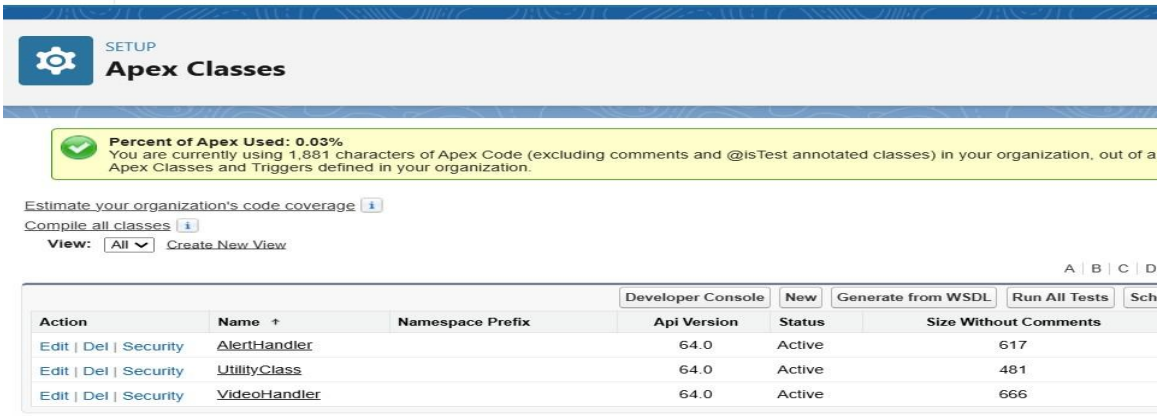
Class Body | Class Summary | Version Settings | Trace Flags

```
public class AlertHandler {

    // Method to send alert based on type
    public static void processAlerts(List<Alert__c> alerts) {
        for(Alert__c a : alerts) {
            if(a.Alert_Type__c == 'System') {
                a.Status__c = 'Pending Review';
            } else if(a.Alert_Type__c == 'Video') {
                a.Status__c = 'Check Video';
            } else {
                a.Status__c = 'User Action Required';
            }
        }
        update alerts;
    }

    // Fetch alerts by type
    public static List<Alert__c> getAlertsByType(String alertType) {
        return [SELECT Id, Name, Alert_Type__c FROM Alert__c WHERE Alert_Type__c = :alertType];
    }
}
```

All Apex Classes :



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

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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.

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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**.

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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**.

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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

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

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

    // 2 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:

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

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

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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.

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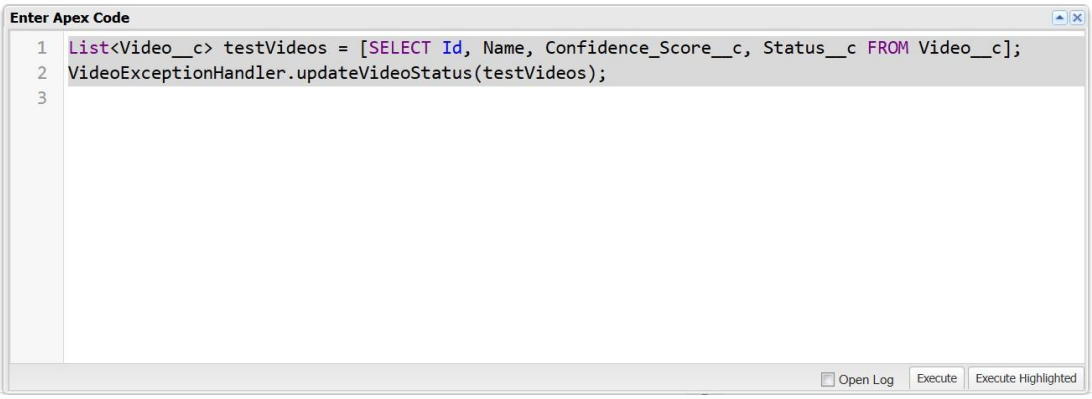
7. Exception Handling

- **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.

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8. Test Classes

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

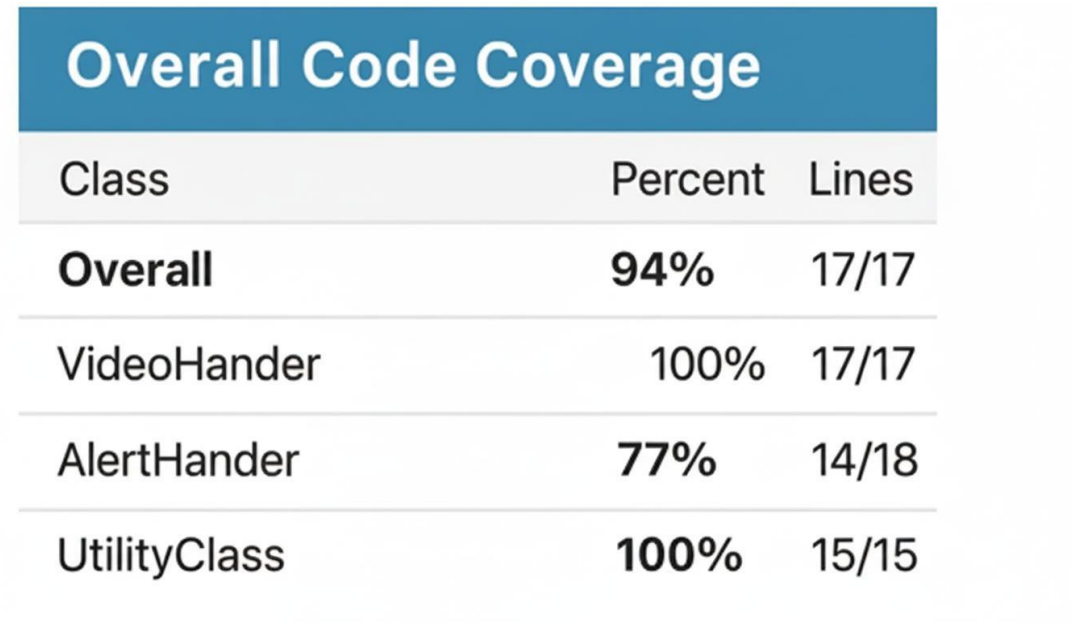
Video Handler Test

```apex
@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