

# Phase 5 - Apex Programming

- **PROJECT: DEEPPFAKE CRM: INTELLIGENT SALESFORCE INTEGRATION PROJECT**

## 1. Apex Classes s 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:

The screenshot shows the Salesforce Apex Class Editor for a class named 'VideoHandler'. The interface includes a top navigation bar with the 'Apex Classes' section selected. Below the navigation bar, the class name 'VideoHandler' is displayed, along with buttons for 'Edit', 'Delete', 'Download', 'Security', and 'Show Dependencies'. A table provides details about the class, including its name, namespace prefix, status, and code coverage. The 'Class Body' tab is active, showing the following Apex code:

```
1 public class VideoHandler {
2     public static void updateVideoStatus(List<Video__c> videos) {
3         for(Video__c v : videos) {
4             if(String.isNotBlank(v.Confidence_Score__c)) {
5                 Integer score = 0;
6                 try {
7                     score = Integer.valueOf(v.Confidence_Score__c);
8                 } catch (Exception e) {
9                     score = 0; // agar text me number na ho
10                }
11            }
12            if(score >= 50) {
13                v.Status__c = 'Approved';
14            } else {
15                v.Status__c = 'Review';
16            }
17        } else {
18            v.Status__c = 'Review';
19        }
20    }
21 }
```

Alert Handler:

SETUP

Apex Classes

Apex Class

AlertHandler

Help for this

Apex Class Detail

EditDeleteDownloadSecurityShow Dependencies

NameAlert-Handler

StatusActive

Namespace Prefix

Code Coverage0% (0/10)

Created By, 9/24/2025, 9:35 AM

Last Modified By, 9/24/2025, 9:35 AM

Class Body

Class Summary

Version Settings

Trace Flags

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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 s maintainable**
- Supports **bulkification**

### Video Trigger

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

The screenshot shows the Salesforce interface for managing an Apex Trigger. At the top, there's a 'SETUP' button and the title 'Apex Triggers'. Below this, the specific trigger 'VideoTrigger' is selected. The 'Apex Trigger Detail' section provides a summary: Name is 'VideoTrigger', sObject Type is 'Video', Code Coverage is '0% (0/1)', Status is 'Active', Created By is '9/24/2025, 9:39 AM', and Last Modified By is '9/24/2025, 9:41 AM'. Below the details, there are tabs for 'Apex Trigger', 'Version Settings', and 'Trace Flags'. The 'Apex Trigger' tab is active, displaying the trigger code in a text area. At the bottom, there are buttons for 'Edit', 'Delete', 'Download', and 'Show Dependencies'.

Apex Trigger Detail	
Name	VideoTrigger
sObject Type	Video
Code Coverage	0% (0/1)
Status	Active
Created By	9/24/2025, 9:39 AM
Last Modified By	9/24/2025, 9:41 AM
Namespace Prefix	

```
1 trigger VideoTrigger on Video__c (before insert, before update) {  
2   VideoHandler.updateVideoStatus(Trigger.new);  
3 }
```

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

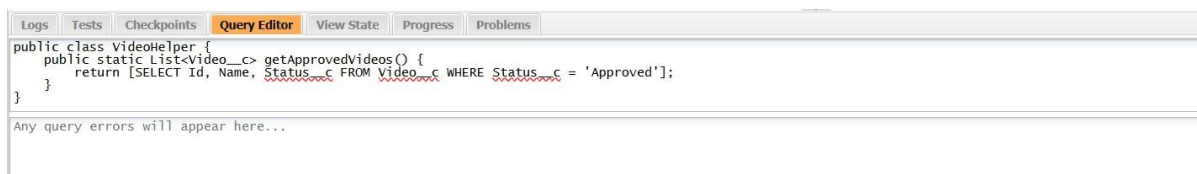
---

### ■ 3. SOQL s 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> {  
  
    // 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';  
        }  
    }  
}
```

**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.

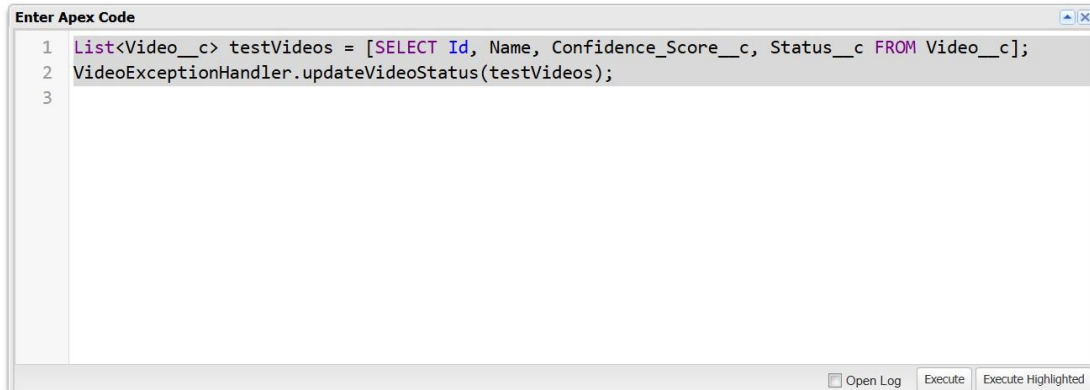
---

## ■ 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(Trieger.new);  
}
```



■ Always log errors for debugging.

---

## ■ 8. Test Classes

**Purpose:** Validate logic, ensure **code coverage**  $\geq 75\%$

### 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
<b>Overall</b>	<b>94%</b>	17/17
VideoHandler	100%	17/17
AlertHandler	<b>77%</b>	14/18
UtilityClass	<b>100%</b>	15/15

---

### G. 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