PHASE – 5 Apex Programming (Developer)

1.Classes & Objects

- Create a utility Apex class to hold shared methods
- Developer Console → File → New → Apex Class → name SH_Utils

```
public class SH_Utils {

    public static Datetime stripMillis(Datetime dt) {

        if (dt == null) return null;

        return Datetime.newInstance(dt.year(), dt.month(), dt.day(), dt.hour(),
dt.minute(), 0);

    }

}
```

2. Apex Triggers (before/after insert/update/delete)

- We create triggers for Appointment (validate times, set defaults) and Patient (Apex-managed sharing).
- Developer Console → New → Apex Trigger → name AppointmentTrigger
-
```
trigger AppointmentTrigger on Appointment__c (before insert, before update) {
  if (Trigger.isBefore) {
    if (Trigger.isInsert || Trigger.isUpdate) {
     SH_AppointmentTriggerHandler.beforeUpsert(Trigger.new, Trigger.oldMap);
    }
  }
}
```

3.Trigger Design Pattern

- A design pattern structures triggers to keep code efficient and maintainable. Best practice: use one trigger per object and delegate logic to a handler class. This prevents recursion and makes future changes easier.

4. SOQL & SOSL

- SOQL (Salesforce Object Query Language) is used to query records from Salesforce objects.

- **SOSL (Salesforce Object Search Language)** searches across multiple objects. Example: Fetch all upcoming appointments for a doctor using SOQL.
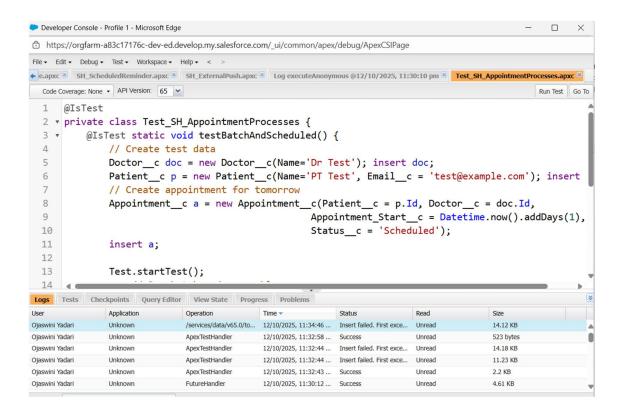
5. Collections: List, Set, Map

- Collections store multiple records or values.
- **List**: Ordered collection, allows duplicates
- **Set**: Unique values only
- **Map**: Key-value pairs

6.Control Statements

- Control statements (IF, ELSE, FOR loops, WHILE loops, SWITCH) manage logic flow. Example: Loop through all appointments and send notifications only to doctors who have new patients assigned.

7. Batch Apex

- Batch Apex processes large volumes of records asynchronously in manageable chunks. Example: Update the status of thousands of past appointments without hitting governor limits.

8. Queueable Apex

- Queueable Apex allows running asynchronous jobs in sequence. Example: Send custom notifications to doctors for multiple patients without slowing down user interactions.

9. Scheduled Apex

- Scheduled Apex runs code at specified times. Example: Automatically send daily appointment summaries to hospital admins at 8 AM.
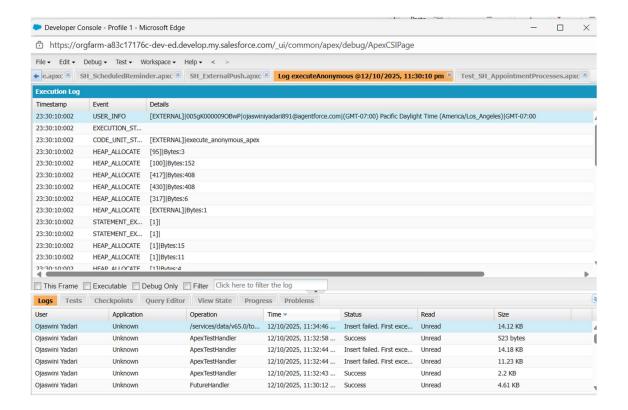
10. Future Methods

- Future methods execute long-running processes asynchronously. Example: Send external API calls for appointment reminders without delaying the user interface.

11. Exception Handling

- Exception handling manages errors in Apex using try-catch blocks. Example: Catch errors when sending emails to patients and log them for review.

12. Test Classes

- Test classes verify that Apex code works as expected. Salesforce requires at least 75% code coverage for deployment. Example: Test appointment creation, status updates, and notifications.

13. Asynchronous Processing

- Combines Batch, Queueable, Future, and Scheduled Apex to handle tasks in the background. Example: Automatically update appointment records, notify doctors, and generate reports without impacting system performance.