Advanced SQL Queries - Part 2

Subqueries and Views

Lesson Objectives (Part 2)

- Understand the use of **subqueries**
- Use **views** to simplify complex queries
- Recognize use cases and benefits

SUBQUERY - Introduction

A **subquery** is a query **nested inside** another query

Types of Subquery

- **In SELECT**: for derived calculations
- **In WHERE**: for comparisons
- **In FROM**: as temporary tables
- **With operators**: `IN`, `ANY`, `ALL`, `EXISTS`, `=`, `<`, `>`

Generic Syntax - Subquery in SELECT

```
SELECT col1, (SELECT AVG(col2) FROM table2) AS avg
FROM table1;
```

Example

Show each book and the average number of available copies in the library

```
SELECT title,
       (SELECT AVG(available_copies) FROM Books) AS avg_copies
FROM Books;
```

Generic Syntax - Subquery in WHERE

```
SELECT col1
FROM table1
WHERE col2 IN (SELECT colx FROM table2 WHERE condition);
```

Example

Show books that have been borrowed at least once

```
SELECT title
FROM Books
WHERE id IN (SELECT book_id FROM Loans);
```

Generic Syntax - Subquery in FROM

```
SELECT sub.col1
FROM (SELECT col1, col2 FROM table WHERE condition) AS sub;
```

Example

Average copies only for Computer Science books

```
SELECT AVG(available_copies)
FROM (SELECT * FROM Books WHERE genre = 'Computer Science') AS cs_books;
```

VIEWS - Introduction

A **view** is a **saved query** that behaves like a virtual table

Characteristics of Views

- Hide complexity
- Improve reusability
- Can be used like a regular table
- Do not physically store data

Generic Syntax - CREATE VIEW

```
CREATE VIEW view_name AS
SELECT col1, col2
FROM table
WHERE condition;
```

Example

View of recent loans

```
CREATE VIEW Recent_Loans AS
SELECT *
FROM Loans
WHERE loan_date >= '2025-01-01';
```

Syntax to use a view

```
SELECT * FROM view_name;
```

Example

Display all recent loans

```
SELECT * FROM Recent_Loans;
```

Delete a View

```
DROP VIEW view_name;
```