

# Foundation Technical Training

## Case Study - Digital Asset Management Application

**Name: Niranjan Kolpe, Batch: C#-Batch 2**

**Problem Statement:** Create following tables in SQL Schema with appropriate class and write the unit test case for the Digital Asset Management application.

### Schema Design:

#### 1. employees table:

- a. employee\_id (Primary Key)
- b. name
- c. department
- d. email
- e. password

#### 2. assets table:

- a. asset\_id (Primary Key): Unique identifier for each asset
- b. name
- c. type: Type of the asset (e.g., laptop, vehicle, equipment)
- d. serial\_number: Serial number or unique identifier of the asset
- e. purchase\_date
- f. location: Current location of the asset
- g. status: Status of the asset (e.g., in use, decommissioned, under maintenance)
- h. owner\_id: (Foreign Key): References the employee who owns the asset

#### 3. maintenance\_records table:

- a. maintenance\_id (Primary Key): Unique identifier for each maintenance record
- b. asset\_id (Foreign Key): References the asset for which maintenance was performed
- c. maintenance\_date
- d. description: Description of the maintenance activity
- e. cost: Cost associated with the maintenance

#### 4. asset\_allocations table:

- a. allocation\_id (Primary Key): Unique identifier for each asset allocation
- b. asset\_id (Foreign Key): References the asset that is allocated
- c. employee\_id (Foreign Key): References the employee to whom the asset is allocated
- d. allocation\_date: Date when the asset was allocated
- e. return\_date: Date when the asset was returned (if applicable)

#### 5. reservations table (to store order details):

- a. reservation\_id (Primary Key): Unique identifier for each reservation
- b. asset\_id (Foreign Key): References the asset that is being reserved

- c. employee\_id (Foreign Key): References the employee who made the reservation
- d. reservation\_date: Date when the reservation was made
- e. start\_date: Date when the reserved asset is needed
- f. end\_date: Date when the reservation ends
- g. status: Status of the reservation (e.g., pending, approved, canceled)

**Program Code in SQL:**

-- Name: Niranjana Kolpe, Batch: C# batch-2

-- Case Study: SQL - Digital Asset Management Application

USE master;

CREATE DATABASE AssetDB;

USE AssetDB;

-- Schema Design

-- 1. Employees Table:

CREATE TABLE employees (employee\_id INT PRIMARY KEY IDENTITY, name VARCHAR(20)  
NOT NULL,

department VARCHAR(20) NOT NULL, email VARCHAR(30) NOT  
NULL, password VARCHAR(30) NOT NULL);

INSERT INTO employees VALUES ('Niranjana', 'Technical', 'niranjana@gmail.com',  
'niranjana@123');

INSERT INTO employees VALUES ('Steve', 'Finance', 'steve@gmail.com',  
'steve@123');

INSERT INTO employees VALUES ('Tony', 'Legal', 'tony@gmail.com',  
'tony@123');

INSERT INTO employees VALUES ('Mark', 'Technical', 'mark@gmail.com',  
'mark@123');

INSERT INTO employees VALUES ('Jessica', 'R and D', 'jessica@gmail.com',  
'jessica@123');

```

INSERT INTO employees VALUES ('Chris',      'Finance',      'chris@gmail.com',
'chris@123');

INSERT INTO employees VALUES ('Benedict', 'Sales',          'benedict@gmail.com',
'benedit@123');

INSERT INTO employees VALUES ('Scarlett', 'Legal',          'scarlett@gmail.com',
'scarlett@123');

INSERT INTO employees VALUES ('Clint',      'Sales',          'clint@gmail.com',
'clint@123');

INSERT INTO employees VALUES ('Sam',        'Technical',      'sam@gmail.com',
'sam@123');

SELECT * FROM employees;

```

-- 2. Assets Table:

```

CREATE TABLE assets (asset_id INT PRIMARY KEY IDENTITY, name VARCHAR(20) NOT
NULL, type VARCHAR(10) NOT NULL,

                        serial_number INT NOT NULL, purchase_date DATE NOT NULL,
location VARCHAR(20) NOT NULL,

                        status VARCHAR(20) NOT NULL, owner_id INT FOREIGN KEY
REFERENCES employees(employee_id));

INSERT INTO assets VALUES ('DELL Computer Setup', 'Laptop',      1, '2024-01-02',
'Chennai',    'Under Maintenance', 2);

INSERT INTO assets VALUES ('HP Computer Setup',    'Laptop',      2, '2024-01-03',
'Mumbai',     'In Use',              3);

INSERT INTO assets VALUES ('Fortuner',             'Vehicle',      3, '2024-01-03',
'Delhi',      'Decommissioned',     4);

INSERT INTO assets VALUES ('Hardware Kit',         'Equipment',    4, '2024-01-09',
'Bengaluru',  'In Use',              2);

INSERT INTO assets VALUES ('Google Pixel Mobile', 'Equipment',    5, '2024-01-10',
'Pune',       'In Use',              1);

INSERT INTO assets VALUES ('Activa',               'Vehicle',      6, '2024-02-15',
'Bengaluru',  'Decommissioned',     4);

```

```

INSERT INTO assets VALUES ('Measurement Kit',      'Equipment', 7, '2024-02-24',
'Chennai',    'Decommissioned',    4);

INSERT INTO assets VALUES ('Generator',            'Equipment', 8, '2024-03-27',
'Mumbai',     'Under Maintenance', 9);

INSERT INTO assets VALUES ('ASUS Computer Setup', 'Laptop',    9, '2024-04-14',
'Delhi',      'In Use',              5);

INSERT INTO assets VALUES ('Ola EV Scooter',       'Vehicle',   10, '2024-05-21',
'Pune',       'Decommissioned',      4);

SELECT * FROM assets;

```

-- 3. Maintenance Records Table:

```

CREATE TABLE maintenance_records (maintenance_id INT PRIMARY KEY IDENTITY,
                                     asset_id INT FOREIGN KEY REFERENCES
assets(asset_id) NOT NULL,
                                     maintenance_date DATE NOT NULL, description
VARCHAR(50) NOT NULL, cost FLOAT NOT NULL);

INSERT INTO maintenance_records VALUES (1, '2024-03-31', 'Cleanup and Software
Updates', 200.00);

INSERT INTO maintenance_records VALUES (8, '2024-04-27', 'Sensor and Meter
Calibration', 1000.00);

SELECT * FROM maintenance_records;

```

-- 4. Asset Allocations Table:

```

CREATE TABLE asset_allocations (allocation_id INT PRIMARY KEY IDENTITY,
                                  asset_id INT FOREIGN KEY REFERENCES
assets(asset_id) NOT NULL,
                                  employee_id INT FOREIGN KEY REFERENCES
employees(employee_id) NOT NULL,

```

```

        allocation_date DATE NOT NULL, return_date DATE
DEFAULT NULL);

INSERT INTO asset_allocations VALUES (1, 2, '2024-01-09', NULL);
INSERT INTO asset_allocations VALUES (2, 3, '2024-01-04', '2024-01-21');
INSERT INTO asset_allocations VALUES (4, 2, '2024-01-10', NULL);
INSERT INTO asset_allocations VALUES (5, 1, '2024-01-11', NULL);
INSERT INTO asset_allocations VALUES (8, 9, '2024-04-01', NULL);
INSERT INTO asset_allocations VALUES (9, 5, '2024-04-15', NULL);
SELECT * FROM asset_allocations;

```

#### -- 5. Reservations Table

```

CREATE TABLE reservations (reservation_id INT PRIMARY KEY IDENTITY,

        asset_id INT FOREIGN KEY REFERENCES assets(asset_id)
NOT NULL,

        employee_id INT FOREIGN KEY REFERENCES
employees(employee_id) NOT NULL,

        reservation_date DATE NOT NULL, start_date DATE NOT
NULL,

        end_date DATE NOT NULL, status VARCHAR(10) NOT NULL);

INSERT INTO reservations VALUES ( 3, 1, '2024-09-12', '2024-10-01', '2024-10-07',
'Cancelled');

INSERT INTO reservations VALUES ( 5, 2, '2024-09-18', '2024-10-01', '2024-10-31',
'Pending');

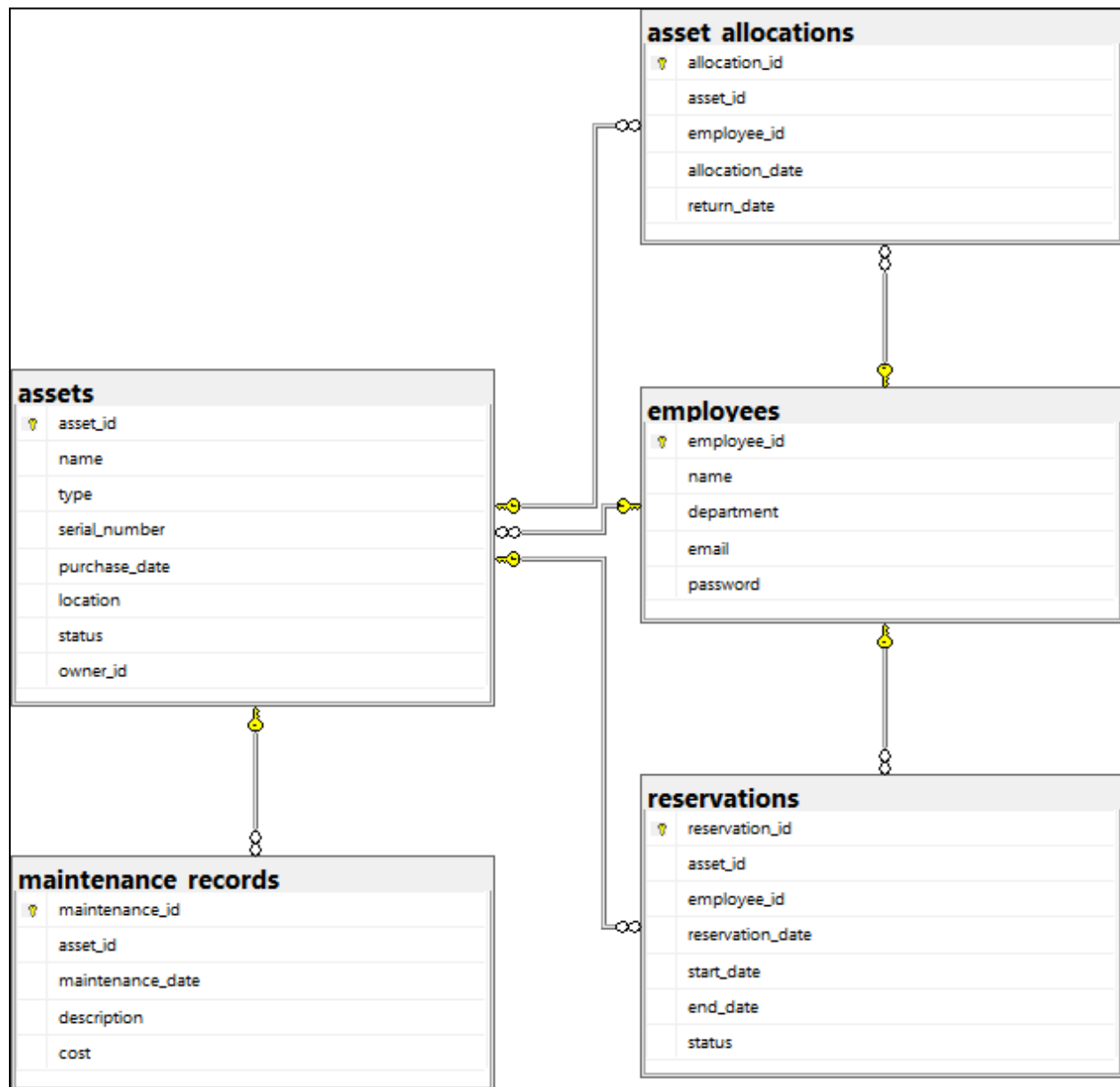
INSERT INTO reservations VALUES ( 7, 8, '2024-09-20', '2024-10-08', '2024-10-21',
'Approved');

INSERT INTO reservations VALUES (10, 4, '2024-09-21', '2024-10-09', '2024-10-15',
'Pending');

SELECT * FROM reservations;

```

### Entity Relationship Diagram:



## Output 1:

SQL Queries.sql - DESKTOP-55ISL9F.AssetDB (DESKTOP-55ISL9F\Niran (75)) - Microsoft SQL Server Management Studio

Object Explorer: Connect to DESKTOP-55ISL9F (SQL Server 16.0.1000.6 - DESKTOP-55ISL9F) | Databases | AssetDB | Tables | employee\_id (PK, int, not null), name (varchar(20), not null), department (varchar(20), not null), email (varchar(30), not null), password (varchar(30), not null)

SQL Queries.sql - D...-55ISL9F\Niran (75) | Case Study: SQL - Digital Asset Management Application

```
-- USE master;
-- CREATE DATABASE AssetDB;
-- USE AssetDB;

-- Schema Design
-- 1. Employees Table:
-- CREATE TABLE employees (employee_id INT PRIMARY KEY IDENTITY, name VARCHAR(20) NOT NULL,
-- department VARCHAR(20) NOT NULL, email VARCHAR(30) NOT NULL, password VARCHAR(30) NOT NULL);
INSERT INTO employees VALUES ('Niranjan', 'Technical', 'niranjan@gmail.com', 'niranjan@123');
INSERT INTO employees VALUES ('Steve', 'Finance', 'steve@gmail.com', 'steve@123');
INSERT INTO employees VALUES ('Tony', 'Legal', 'tony@gmail.com', 'tony@123');
INSERT INTO employees VALUES ('Mark', 'Technical', 'mark@gmail.com', 'mark@123');
INSERT INTO employees VALUES ('Jessica', 'R and D', 'jessica@gmail.com', 'jessica@123');
INSERT INTO employees VALUES ('Chris', 'Finance', 'chris@gmail.com', 'chris@123');
INSERT INTO employees VALUES ('Benedict', 'Sales', 'benedict@gmail.com', 'benedict@123');
INSERT INTO employees VALUES ('Scarlett', 'Legal', 'scarlett@gmail.com', 'scarlett@123');
INSERT INTO employees VALUES ('Clinton', 'Sales', 'clint@gmail.com', 'clint@123');
INSERT INTO employees VALUES ('Sam', 'Technical', 'sam@gmail.com', 'sam@123');
SELECT * FROM employees;
```

Results: Messages

| employee_id | name     | department | email              | password     |
|-------------|----------|------------|--------------------|--------------|
| 1           | Niranjan | Technical  | niranjan@gmail.com | niranjan@123 |
| 2           | Steve    | Finance    | steve@gmail.com    | steve@123    |
| 3           | Tony     | Legal      | tony@gmail.com     | tony@123     |
| 4           | Mark     | Technical  | mark@gmail.com     | mark@123     |
| 5           | Jessica  | R and D    | jessica@gmail.com  | jessica@123  |
| 6           | Chris    | Finance    | chris@gmail.com    | chris@123    |
| 7           | Benedict | Sales      | benedict@gmail.com | benedict@123 |
| 8           | Scarlett | Legal      | scarlett@gmail.com | scarlett@123 |
| 9           | Clinton  | Sales      | clint@gmail.com    | clint@123    |

Query executed successfully. DESKTOP-55ISL9F (16.0 RTM) | DESKTOP-55ISL9F\Niran ... | AssetDB | 00:00:00 | 10 rows

## Output 2:

SQL Queries.sql - DESKTOP-55ISL9F.AssetDB (DESKTOP-55ISL9F\Niran (75)) - Microsoft SQL Server Management Studio

Object Explorer: Connect to DESKTOP-55ISL9F (SQL Server 16.0.1000.6 - DESKTOP-55ISL9F) | Databases | AssetDB | Tables | asset\_id (PK, int, not null), name (varchar(20), not null), type (varchar(10), not null), serial\_number (int, not null), purchase\_date (date, not null), location (varchar(20), not null), status (varchar(20), not null), owner\_id (FK, int, null)

SQL Queries.sql - D...-55ISL9F\Niran (75) | Case Study: SQL - Digital Asset Management Application

```
-- 2. Assets Table:
-- CREATE TABLE assets (asset_id INT PRIMARY KEY IDENTITY, name VARCHAR(20) NOT NULL, type VARCHAR(10) NOT NULL,
-- serial_number INT NOT NULL, purchase_date DATE NOT NULL, location VARCHAR(20) NOT NULL,
-- status VARCHAR(20) NOT NULL, owner_id INT FOREIGN KEY REFERENCES employees(employee_id));
INSERT INTO assets VALUES ('DELL Computer Setup', 'Laptop', 1, '2024-01-02', 'Chennai', 'Under Maintenance', 2);
INSERT INTO assets VALUES ('HP Computer Setup', 'Laptop', 2, '2024-01-03', 'Mumbai', 'In Use', 3);
INSERT INTO assets VALUES ('Fortuner', 'Vehicle', 3, '2024-01-03', 'Delhi', 'Decommissioned', 4);
INSERT INTO assets VALUES ('Hardware Kit', 'Equipment', 4, '2024-01-09', 'Bengaluru', 'In Use', 2);
INSERT INTO assets VALUES ('Google Pixel Mobile', 'Equipment', 5, '2024-01-10', 'Pune', 'In Use', 1);
INSERT INTO assets VALUES ('Activa', 'Vehicle', 6, '2024-02-15', 'Bengaluru', 'Decommissioned', 4);
INSERT INTO assets VALUES ('Measurement Kit', 'Equipment', 7, '2024-02-24', 'Chennai', 'Decommissioned', 4);
INSERT INTO assets VALUES ('Generator', 'Equipment', 8, '2024-03-27', 'Mumbai', 'Under Maintenance', 9);
INSERT INTO assets VALUES ('ASUS Computer Setup', 'Laptop', 9, '2024-04-14', 'Delhi', 'In Use', 5);
INSERT INTO assets VALUES ('Dla EV Scooter', 'Vehicle', 10, '2024-05-21', 'Pune', 'Decommissioned', 4);
SELECT * FROM assets;
```

Results: Messages

| asset_id | name                | type      | serial_number | purchase_date | location  | status            | owner_id |
|----------|---------------------|-----------|---------------|---------------|-----------|-------------------|----------|
| 1        | DELL Computer Setup | Laptop    | 1             | 2024-01-02    | Chennai   | Under Maintenance | 2        |
| 2        | HP Computer Setup   | Laptop    | 2             | 2024-01-03    | Mumbai    | In Use            | 3        |
| 3        | Fortuner            | Vehicle   | 3             | 2024-01-03    | Delhi     | Decommissioned    | 4        |
| 4        | Hardware Kit        | Equipment | 4             | 2024-01-09    | Bengaluru | In Use            | 2        |
| 5        | Google Pixel Mobile | Equipment | 5             | 2024-01-10    | Pune      | In Use            | 1        |
| 6        | Activa              | Vehicle   | 6             | 2024-02-15    | Bengaluru | Decommissioned    | 4        |
| 7        | Measurement Kit     | Equipment | 7             | 2024-02-24    | Chennai   | Decommissioned    | 4        |
| 8        | Generator           | Equipment | 8             | 2024-03-27    | Mumbai    | Under Maintenance | 9        |
| 9        | ASUS Computer Setup | Laptop    | 9             | 2024-04-14    | Delhi     | In Use            | 5        |

Query executed successfully. DESKTOP-55ISL9F (16.0 RTM) | DESKTOP-55ISL9F\Niran ... | AssetDB | 00:00:00 | 10 rows

The screenshot shows the Microsoft SQL Server Enterprise Edition interface. The top bar indicates the connection to 'DESKTOP-55ISL9F AssetDB (DESKTOP-55ISL9F\ntiran (75)) - Microsoft SQL Server Management Studio'. The 'Object Explorer' on the left shows the database structure for 'AssetDB', including tables like 'assets', 'maintenance\_records', and 'asset\_allocations'. The main window displays the SQL script executed, which includes INSERT statements for assets and maintenance records, and a CREATE TABLE statement for asset\_allocations. The Results pane shows the output of the query, displaying two rows of data from the 'asset\_allocations' table.

|   | maintenance_id | asset_id | maintenance_date | description                  | cost |
|---|----------------|----------|------------------|------------------------------|------|
| 1 | 1              | 1        | 2024-03-31       | Cleanup and Software Updates | 200  |
| 2 | 2              | 8        | 2024-04-27       | Sensor and Meter Calibration | 1000 |

The screenshot displays the Microsoft SQL Server Enterprise Edition interface. The main window, titled "SQL Queries - D...-55ISL9F\ntiran (75)", shows a SQL script for creating two tables: "asset\_allocations" and "reservations". The script includes column definitions, primary and foreign key constraints, and data insertion statements. The "Object Explorer" on the left pane shows the database structure, including the "AssetDB" database and its tables. The "Results" pane at the bottom displays the output of the query, showing a list of reservations with columns: "allocation\_id", "asset\_id", "employee\_id", "allocation\_date", and "return\_date". The status bar at the bottom indicates the query was executed successfully on the "AssetDB" database, returning 6 rows.

**SQL Script:**

```
-- 4. Asset Allocations Table:
CREATE TABLE asset_allocations (
    allocation_id INT PRIMARY KEY IDENTITY,
    asset_id INT FOREIGN KEY REFERENCES assets(asset_id) NOT NULL,
    employee_id INT FOREIGN KEY REFERENCES employees(employee_id) NOT NULL,
    allocation_date DATE NOT NULL, return_date DATE DEFAULT NULL);

INSERT INTO asset_allocations VALUES (1, 2, '2024-01-09', NULL);
INSERT INTO asset_allocations VALUES (2, 3, '2024-01-04', '2024-01-21');
INSERT INTO asset_allocations VALUES (4, 2, '2024-01-10', NULL);
INSERT INTO asset_allocations VALUES (5, 1, '2024-01-11', NULL);
INSERT INTO asset_allocations VALUES (8, 9, '2024-04-01', NULL);
INSERT INTO asset_allocations VALUES (9, 5, '2024-04-15', NULL);
SELECT * FROM asset_allocations;

-- 5. Reservations Table
CREATE TABLE reservations (
    reservation_id INT PRIMARY KEY IDENTITY,
    asset_id INT FOREIGN KEY REFERENCES assets(asset_id) NOT NULL,
    employee_id INT FOREIGN KEY REFERENCES employees(employee_id) NOT NULL,
    reservation_date DATE NOT NULL, start_date DATE NOT NULL,
    end_date DATE NOT NULL, status VARCHAR(10) NOT NULL);

INSERT INTO reservations VALUES (3, 1, '2024-09-11', '2024-10-01', '2024-10-07', 'Cancelled');
INSERT INTO reservations VALUES (5, 2, '2024-09-18', '2024-10-01', '2024-10-31', 'Pending');
INSERT INTO reservations VALUES (7, 8, '2024-09-28', '2024-10-08', '2024-10-21', 'Approved');
INSERT INTO reservations VALUES (10, 4, '2024-09-28', '2024-10-08', '2024-10-28', 'Approved');
```

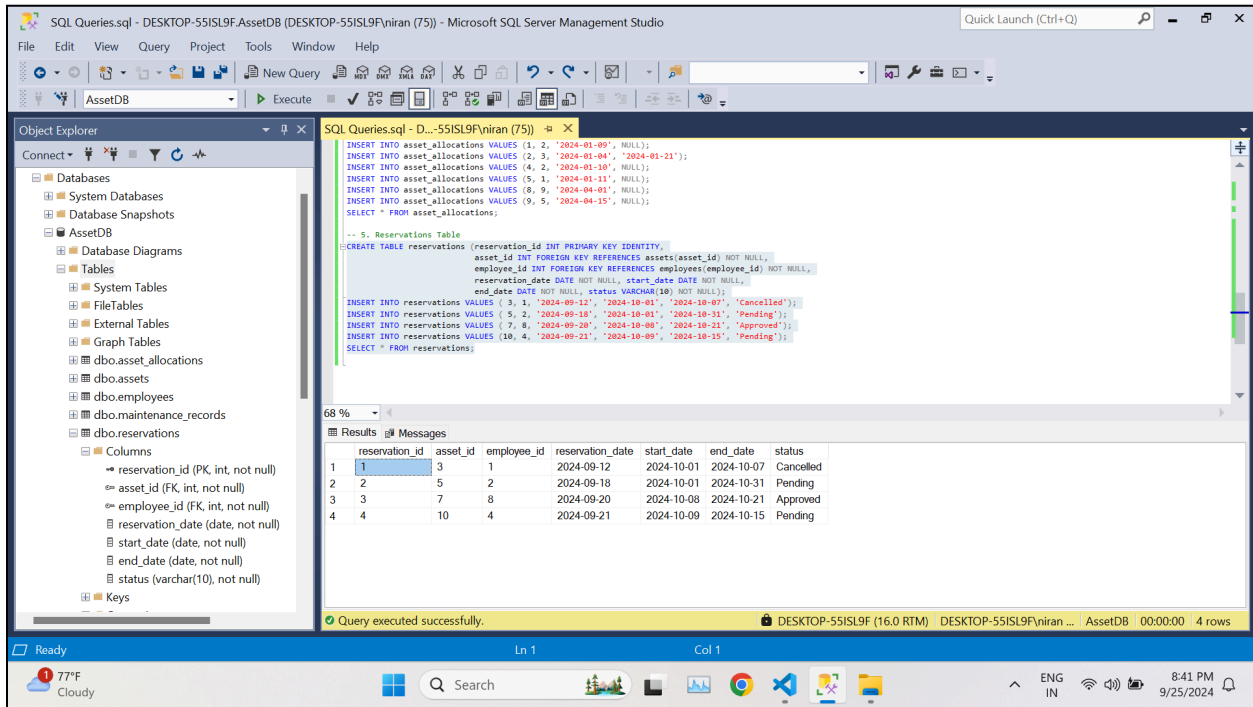
**Results:**

| allocation_id | asset_id | employee_id | allocation_date | return_date |
|---------------|----------|-------------|-----------------|-------------|
| 1             | 2        | 1           | 2024-01-09      | NULL        |
| 2             | 3        | 2           | 2024-01-04      | 2024-01-21  |
| 3             | 4        | 2           | 2024-01-10      | NULL        |
| 4             | 5        | 1           | 2024-01-11      | NULL        |
| 5             | 8        | 9           | 2024-04-01      | NULL        |
| 6             | 6        | 9           | 2024-04-15      | NULL        |

**Status:** Query executed successfully. DESKTOP-55ISL9F (16.0 RTM) DESKTOP-55ISL9F\ntiran ... AssetDB 00:00:00 6 rows



## Output 5:



The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The main window shows a SQL query that has been executed successfully. The query includes several INSERT statements for the 'asset\_allocations' table and a CREATE TABLE statement for the 'reservations' table, followed by INSERT statements for the 'reservations' table. The results pane shows the output of the query, which is a table with 4 rows and 7 columns: reservation\_id, asset\_id, employee\_id, reservation\_date, start\_date, end\_date, and status.

**Query Executed Successfully.**

**Results:**

| reservation_id | asset_id | employee_id | reservation_date | start_date | end_date   | status    |
|----------------|----------|-------------|------------------|------------|------------|-----------|
| 1              | 3        | 1           | 2024-09-12       | 2024-10-01 | 2024-10-07 | Cancelled |
| 2              | 5        | 2           | 2024-09-18       | 2024-10-01 | 2024-10-31 | Pending   |
| 3              | 7        | 8           | 2024-09-20       | 2024-10-08 | 2024-10-21 | Approved  |
| 4              | 10       | 4           | 2024-09-21       | 2024-10-09 | 2024-10-15 | Pending   |

Query executed successfully. DESKTOP-55ISL9F (16.0 RTM) DESKTOP-55ISL9F\niran ... AssetDB 00:00:00 4 rows