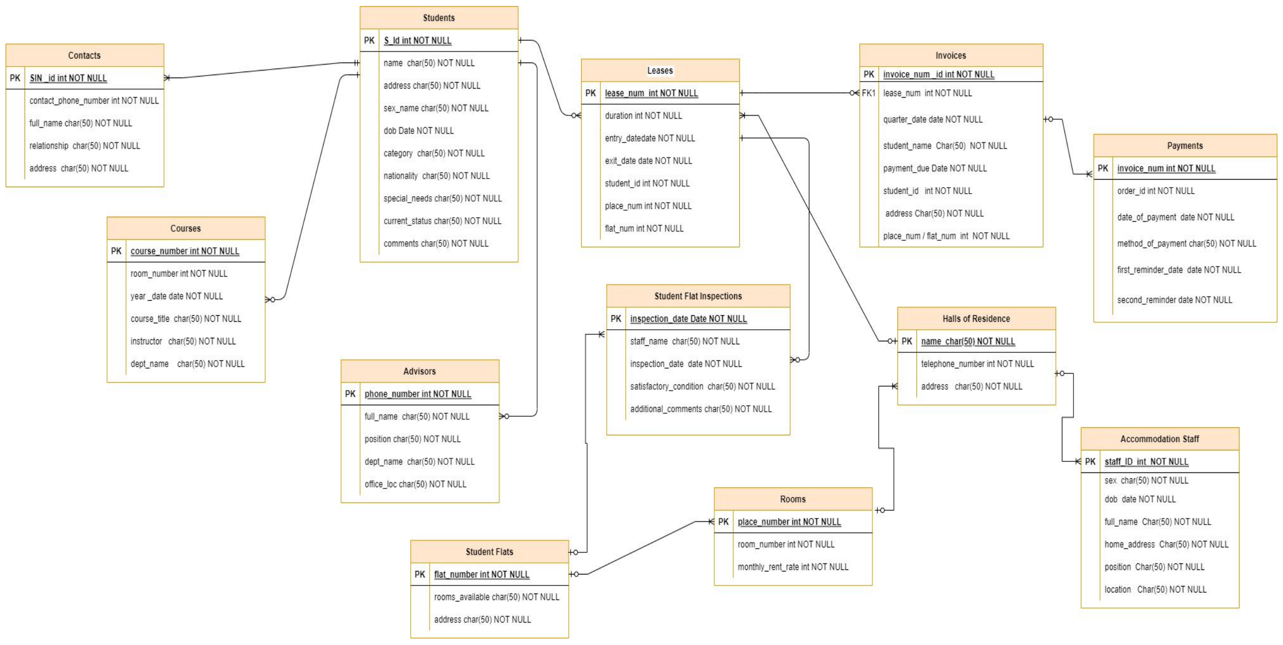
DBFUND – Final Project: Designing and Implementing a Database

Tutor Were Vincent

DBFUND – Final Project: Designing and Implementing a Database

a. Diagram representing the tables and their relationships

1) Diagram


Contacts
PK SIN_id int NOT NULL
contact_phone_number int NOT NULL
full_name char(50) NOT NULL
relationship char(50) NOT NULL
address char(50) NOT NULL
Students
PK S_Id int NOT NULL
name char(50) NOT NULL
address char(50) NOT NULL
sex_name char(50) NOT NULL
dob Date NOT NULL
category char(50) NOT NULL
nationality char(50) NOT NULL
special_needs char(50) NOT NULL
current_status char(50) NOT NULL
comments char(50) NOT NULL
Leases
PK lease_num int NOT NULL
duration int NOT NULL
entry_datedate NOT NULL
exit_date date NOT NULL
student_id int NOT NULL
place_num int NOT NULL
flat_num int NOT NULL
Invoices
PK invoice_num _id int NOT NULL
FK1 lease_num int NOT NULL
quarter_date date NOT NULL
student_name Char(50) NOT NULL
payment_due Date NOT NULL
student_id int NOT NULL
address Char(50) NOT NULL
place_num / flat_num int NOT NULL
Payments
PK invoice_num int NOT NULL
order_id int NOT NULL
date_of_payment date NOT NULL
method_of_payment char(50) NOT NULL
first_reminder_date date NOT NULL
second_reminder date NOT NULL
Courses
PK course_number int NOT NULL
room_number int NOT NULL
year _date date NOT NULL
course_title char(50) NOT NULL
instructor char(50) NOT NULL
dept_name char(50) NOT NULL
Advisors
PK phone_number int NOT NULL
full_name char(50) NOT NULL
position char(50) NOT NULL
dept_name char(50) NOT NULL
office_loc char(50) NOT NULL
Student Flat Inspections
PK inspection_date Date NOT NULL
staff_name char(50) NOT NULL
inspection_date date NOT NULL
satisfactory_condition char(50) NOT NULL
additional_comments char(50) NOT NULL
Halls of Residence
PK name char(50) NOT NULL
telephone_number int NOT NULL
address char(50) NOT NULL
Accommodation Staff
PK staff_ID int NOT NULL
sex char(50) NOT NULL
dob date NOT NULL
full_name Char(50) NOT NULL
home_address Char(50) NOT NULL
position Char(50) NOT NULL
location Char(50) NOT NULL
Rooms
PK place_number int NOT NULL
room_number int NOT NULL
monthly_rent_rate int NOT NULL
Student Flats
PK flat_number int NOT NULL
rooms_available char(50) NOT NULL
address char(50) NOT NULL

2) Relationships

i. Students and Leases

One-to-Many: A student can have multiple leases over time, but each lease belongs to one student.

ii. Students and Advisors

One-to-Many: Each student has one advisor, but an advisor may advise multiple students.

iii. Students and Courses

Many-to-Many: A student can be registered for multiple courses, and a course can have multiple students.

iv. Students and Contacts

One-to-Many: Each student can have multiple contacts, but each contact is associated with one student.

v. Leases and Invoices

One-to-Many: Each lease can have multiple invoices, but each invoice is related to one lease.

vi. Leases and Student Flat Inspections

One-to-Many: Each lease can have multiple inspections, but each inspection is related to one lease.

vii. Leases and Student Flats (or Halls of Residence)

Many-to-One: Each lease is associated with one student flat or hall, but multiple leases can be associated with the same flat or hall.

viii. Invoices and Payments

One-to-Many: Each invoice can have multiple payments, but each payment is associated with one invoice.

ix. Advisors and Students

One-to-Many: Each advisor advises multiple students, but each student has only one advisor.

x. Halls of Residence and Rooms

One-to-Many: Each hall has multiple rooms, but each room belongs to one hall.

xi. Student Flats and Rooms

One-to-Many: Each student flat has multiple rooms, but each room belongs to one student flat.

xii. Student Flat Inspections and Student Flats

One-to-Many: Each inspection is related to one student flat, but a student flat may have multiple inspections over time.

xiii. Accommodation Staff and Halls of Residence

One-to-Many: Each staff member is associated with one hall, but each hall has multiple staff members.

xiv. Courses and Students

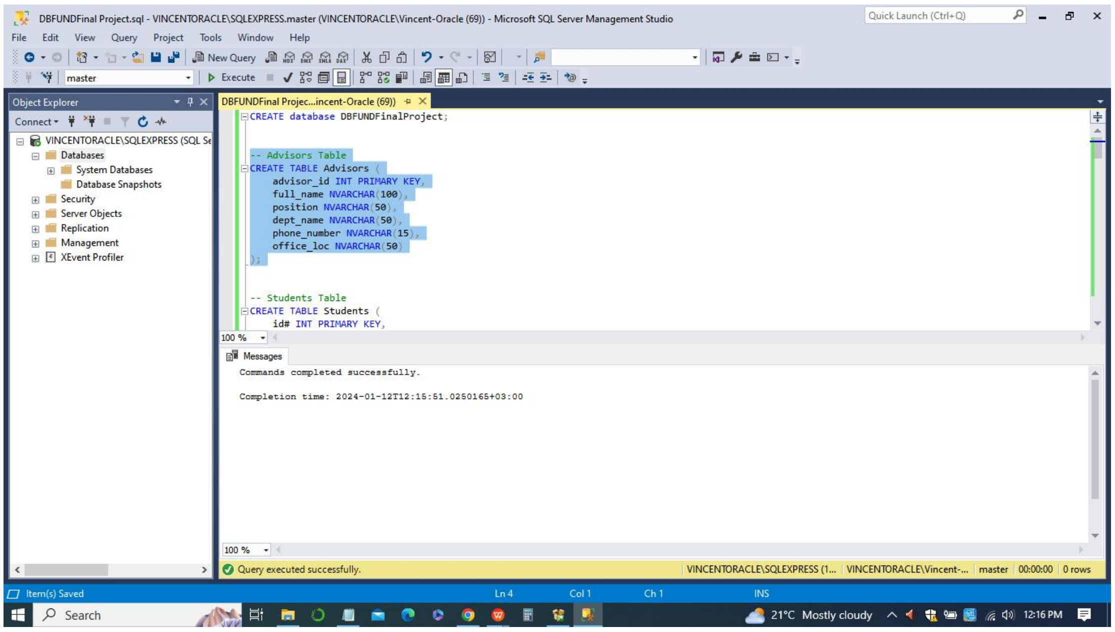
Many-to-Many: A course can have multiple students, and a student can be enrolled in multiple courses.

xv. Contacts and Students

One-to-Many: Each contact is associated with one student, but each student can have multiple contacts.

These relationships help define how the different entities in the database are connected and how data flows between them. It's essential to maintain referential integrity and ensure that the relationships reflect the real-world connections between the entities accurately.

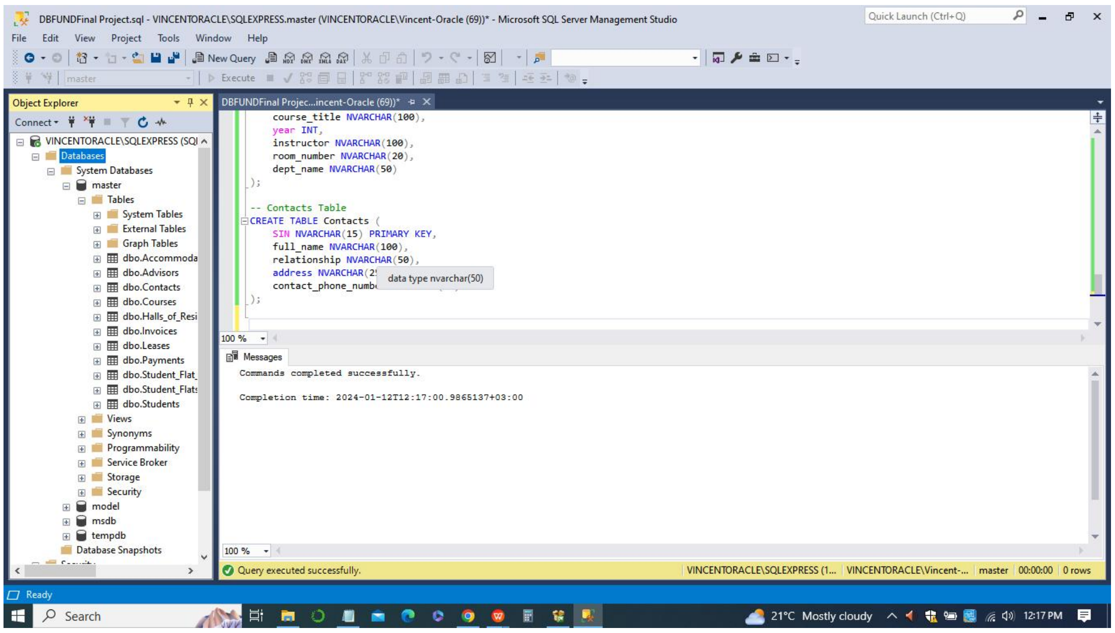
b. Tables in Microsoft SQL Server 2019 (GUI or commands)



```
CREATE database DBFUNDFinalProject;


-- Advisors Table
CREATE TABLE Advisors (
    advisor_id INT PRIMARY KEY,
    full_name NVARCHAR(100),
    position NVARCHAR(50),
    dept_name NVARCHAR(50),
    phone_number NVARCHAR(15),
    office_loc NVARCHAR(50)
);


-- Students Table
CREATE TABLE Students (
    id# INT PRIMARY KEY,
```

```
Commands completed successfully.

Completion time: 2024-01-12T12:15:51.0250165+03:00
```

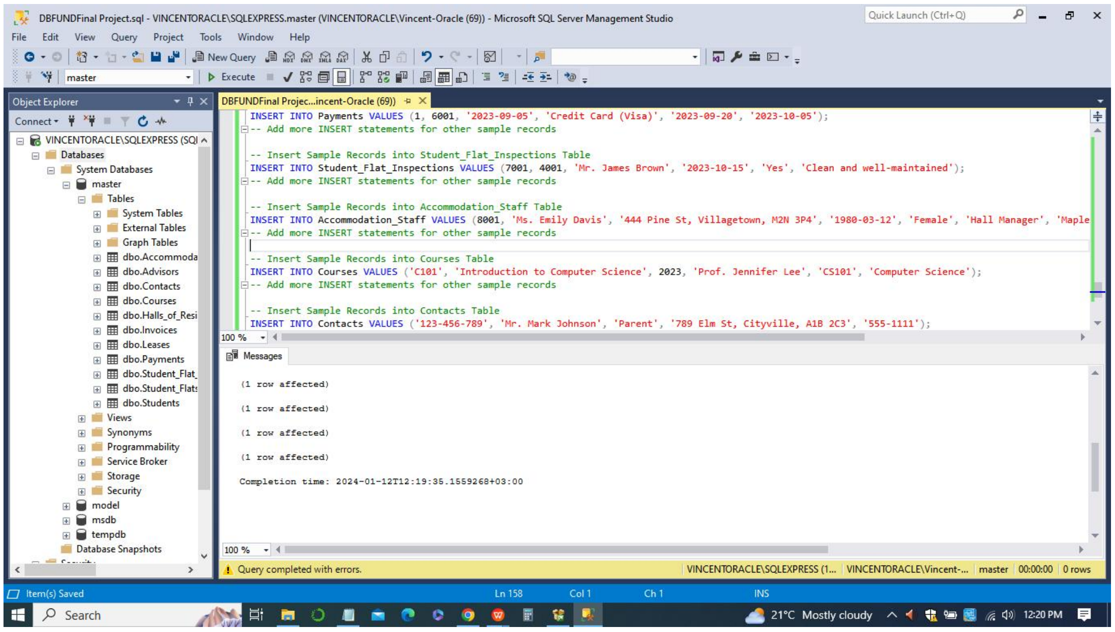
DBFUNDFinal Project.sql - VINCENTORACLE\SQLEXPRESS.master (VINCENTORACLE\Vincent-Oracle (69)) - Microsoft SQL Server Management Studio
Object Explorer
VINCENTORACLE\SQLEXPRESS (SQL Se
Databases
System Databases
Database Snapshots
Security
Server Objects
Replication
Management
XEvent Profiler
Query executed successfully.
VINCENTORACLE\SQLEXPRESS (1... | VINCENTORACLE\Vincent-... | master | 00:00:00 | 0 rows
Item(s) Saved
Ln 4 Col 1 Ch 1 INS
21°C Mostly cloudy
12:16 PM



```
    course_title NVARCHAR(100),
    year INT,
    instructor NVARCHAR(100),
    room_number NVARCHAR(20),
    dept_name NVARCHAR(50)
);

-- Contacts Table
CREATE TABLE Contacts (
    SIN NVARCHAR(15) PRIMARY KEY,
    full_name NVARCHAR(100),
    relationship NVARCHAR(50),
    address NVARCHAR(2
    contact_phone_numb
);
```

```
Commands completed successfully.

Completion time: 2024-01-12T12:17:00.9865137+03:00
```

c. Sample records within each table

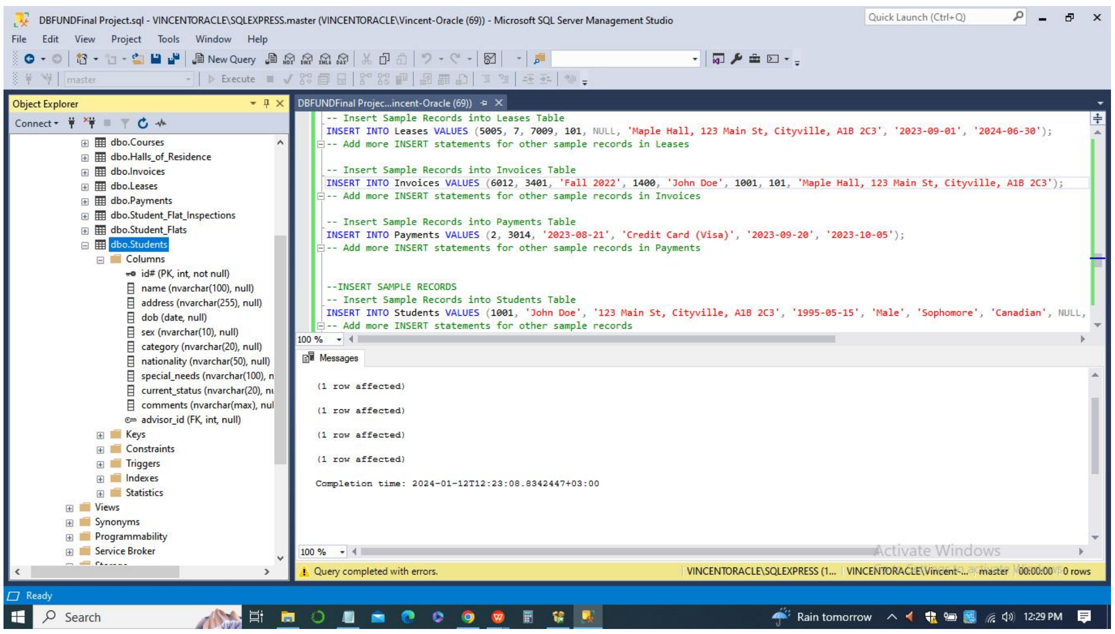


```
INSERT INTO Payments VALUES (1, 6001, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
-- Add more INSERT statements for other sample records

-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7001, 4001, 'Mr. James Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');
-- Add more INSERT statements for other sample records

-- Insert Sample Records into Accommodation_Staff Table
INSERT INTO Accommodation_Staff VALUES (8001, 'Ms. Emily Davis', '444 Pine St, Villagetown, M2N 3P4', '1980-03-12', 'Female', 'Hall Manager', 'Maple
-- Add more INSERT statements for other sample records

-- Insert Sample Records into Courses Table
INSERT INTO Courses VALUES ('C101', 'Introduction to Computer Science', 2023, 'Prof. Jennifer Lee', 'CS101', 'Computer Science');
-- Add more INSERT statements for other sample records

-- Insert Sample Records into Contacts Table
INSERT INTO Contacts VALUES ('123-456-789', 'Mr. Mark Johnson', 'Parent', '789 Elm St, Cityville, A1B 2C3', '555-1111');
```

```
(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

Completion time: 2024-01-12T12:19:35.1559268+03:00
```

Query completed with errors.

-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1001, 'John Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL, 'Placed', 'Excellent student', 2001);



DBFUNDFinal Project.sql - VINCENTORACLE\SQLEXPRESS.master (VINCENTORACLE\Vincent-Oracle (69)) - Microsoft SQL Server Management Studio

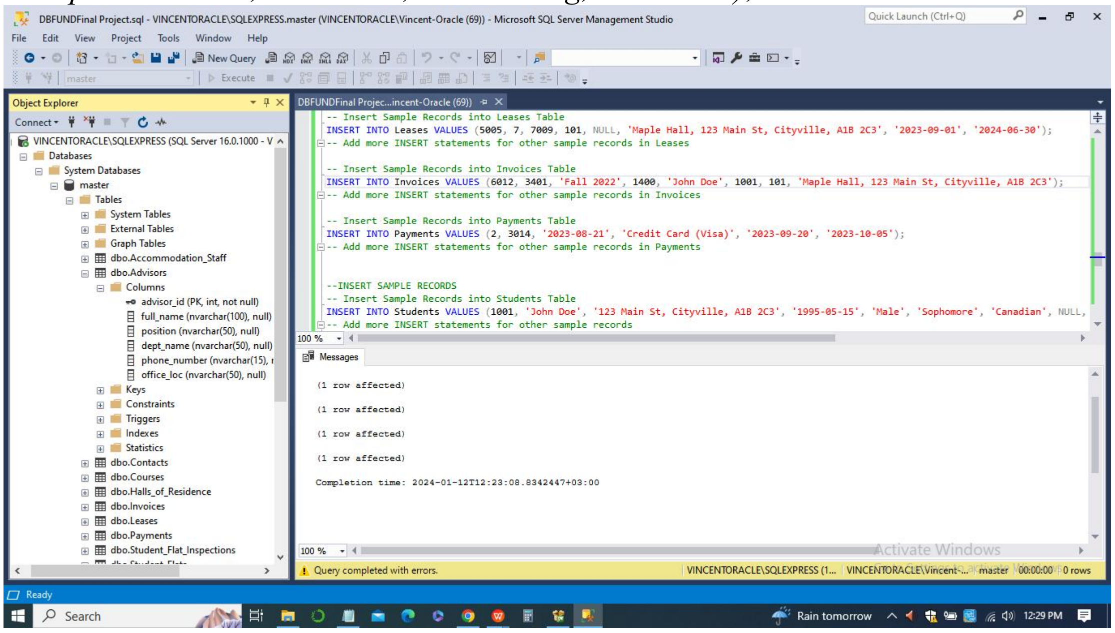
```
dbo.Courses
dbo.Halls_of_Residence
dbo.Invoices
dbo.Leases
dbo.Payments
dbo.Student_Flat_Inspections
dbo.Student_Flats
dbo.Students
  Columns
    id# (PK, int, not null)
    name (nvarchar(100), null)
    address (nvarchar(255), null)
    dob (date, null)
    sex (nvarchar(10), null)
    category (nvarchar(20), null)
    nationality (nvarchar(50), null)
    special_needs (nvarchar(100), n
    current_status (nvarchar(20), nu
    comments (nvarchar(max), nul
    advisor_id (FK, int, null)
  Keys
  Constraints
  Triggers
  Indexes
  Statistics
Views
Synonyms
Programmability
Service Broker
```

```sql
-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5005, 7, 7009, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');
-- Add more INSERT statements for other sample records in Leases

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 3401, 'Fall 2022', 1400, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
-- Add more INSERT statements for other sample records in Invoices

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (2, 3014, '2023-08-21', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
-- Add more INSERT statements for other sample records in Payments


--INSERT SAMPLE RECORDS
-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1001, 'John Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL,
-- Add more INSERT statements for other sample records
```

```
(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

Completion time: 2024-01-12T12:23:08.8342447+03:00
```

Query completed with errors. VINCENTORACLE\SQLEXPRESS (1... VINCENTORACLE\Vincent-... master 00:00:00 0 rows

-- Insert Sample Records into Advisors Table
INSERT INTO Advisors VALUES (2001, 'Dr. Alice Johnson', 'Academic Advisor', 'Computer Science', '555-1234', 'CS Building, Room 101');



DBFUNDFinal Project.sql - VINCENTORACLE\SQLEXPRESS.master (VINCENTORACLE\Vincent-Oracle (69)) - Microsoft SQL Server Management Studio

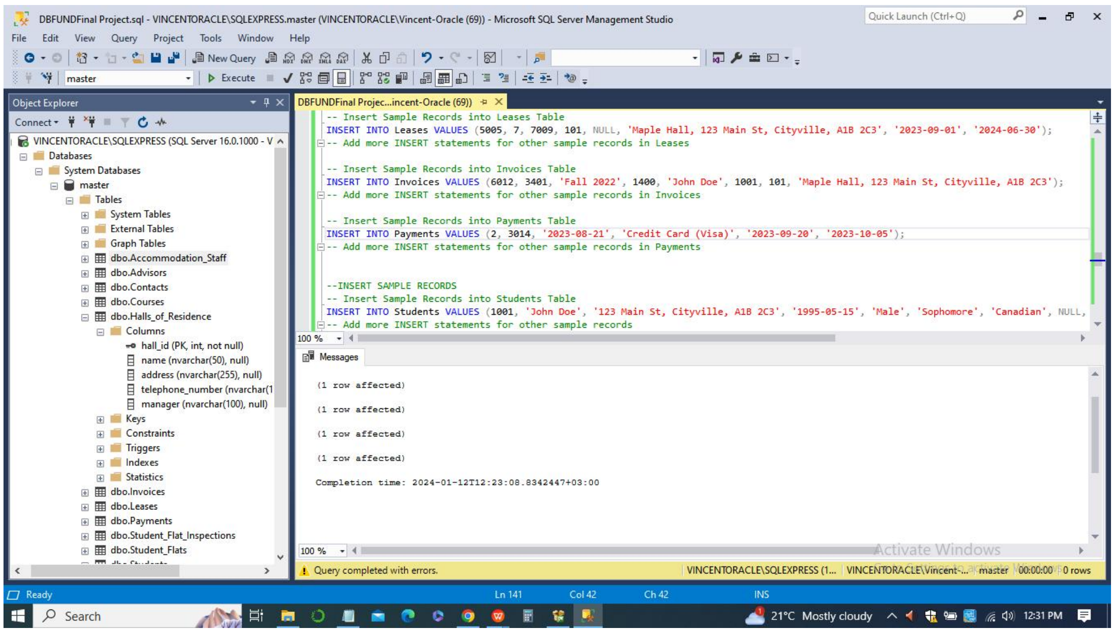
```
VINCENTORACLE\SQLEXPRESS (SQL Server 16.0.1000 - V
  Databases
    System Databases
      master
        Tables
          System Tables
          External Tables
          Graph Tables
          dbo.Accommodation_Staff
          dbo.Advisors
            Columns
              advisor_id (PK, int, not null)
              full_name (nvarchar(100), null)
              position (nvarchar(50), null)
              dept_name (nvarchar(50), null)
              phone_number (nvarchar(15), r
              office_loc (nvarchar(50), null)
            Keys
            Constraints
            Triggers
            Indexes
            Statistics
          dbo.Contacts
          dbo.Courses
          dbo.Halls_of_Residence
          dbo.Invoices
          dbo.Leases
          dbo.Payments
          dbo.Student_Flat_Inspections
```

```sql
-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5005, 7, 7009, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');
-- Add more INSERT statements for other sample records in Leases

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 3401, 'Fall 2022', 1400, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
-- Add more INSERT statements for other sample records in Invoices

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (2, 3014, '2023-08-21', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
-- Add more INSERT statements for other sample records in Payments


--INSERT SAMPLE RECORDS
-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1001, 'John Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL,
-- Add more INSERT statements for other sample records
```

```
(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

Completion time: 2024-01-12T12:23:08.8342447+03:00
```

Query completed with errors. VINCENTORACLE\SQLEXPRESS (1... VINCENTORACLE\Vincent-... master 00:00:00 0 rows

-- Insert Sample Records into Halls_of_Residence Table
INSERT INTO Halls_of_Residence VALUES (3001, 'Maple Hall', '789 Pine St, Villagetown, M2N 3P4', '555-9876', 'Mr. James Brown');

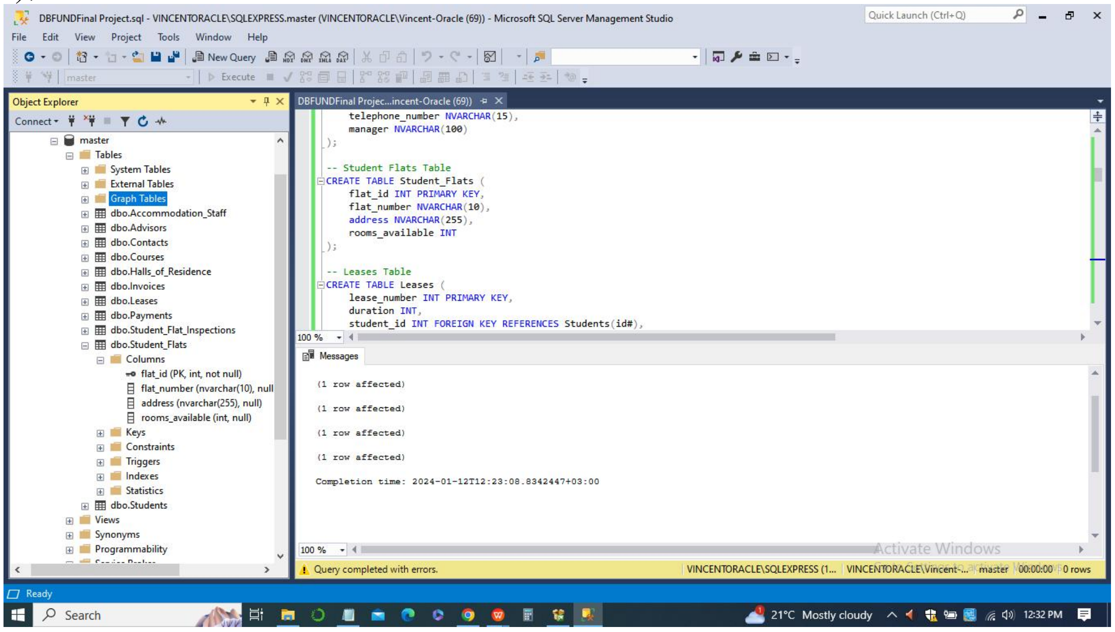


```
-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5005, 7, 7009, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');
-- Add more INSERT statements for other sample records in Leases

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 3401, 'Fall 2022', 1400, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
-- Add more INSERT statements for other sample records in Invoices

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (2, 3014, '2023-08-21', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
-- Add more INSERT statements for other sample records in Payments


--INSERT SAMPLE RECORDS
-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1001, 'John Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL,
-- Add more INSERT statements for other sample records
```

```
(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

Completion time: 2024-01-12T12:23:08.8342447+03:00
```

Query completed with errors.

-- Insert Sample Records into Student_Flats Table
INSERT INTO Student_Flats VALUES (4001, 'F101', '111 Elm St, Cityville, A1B 2C3', 3);

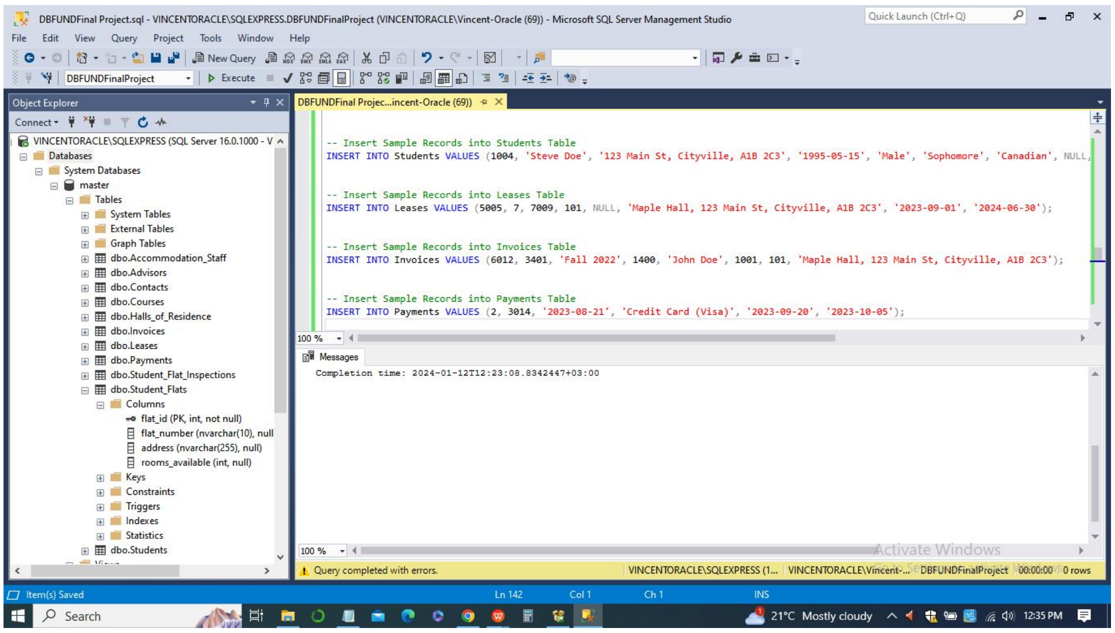


```
    telephone_number NVARCHAR(15),
    manager NVARCHAR(100)
);

-- Student Flats Table
CREATE TABLE Student_Flats (
    flat_id INT PRIMARY KEY,
    flat_number NVARCHAR(10),
    address NVARCHAR(255),
    rooms_available INT
);

-- Leases Table
CREATE TABLE Leases (
    lease_number INT PRIMARY KEY,
    duration INT,
    student_id INT FOREIGN KEY REFERENCES Students(id#),
```

```
(1 row affected)

(1 row affected)

(1 row affected)

(1 row affected)

Completion time: 2024-01-12T12:23:08.8342447+03:00
```

Query completed with errors.

-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5001, 2, 1001, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');

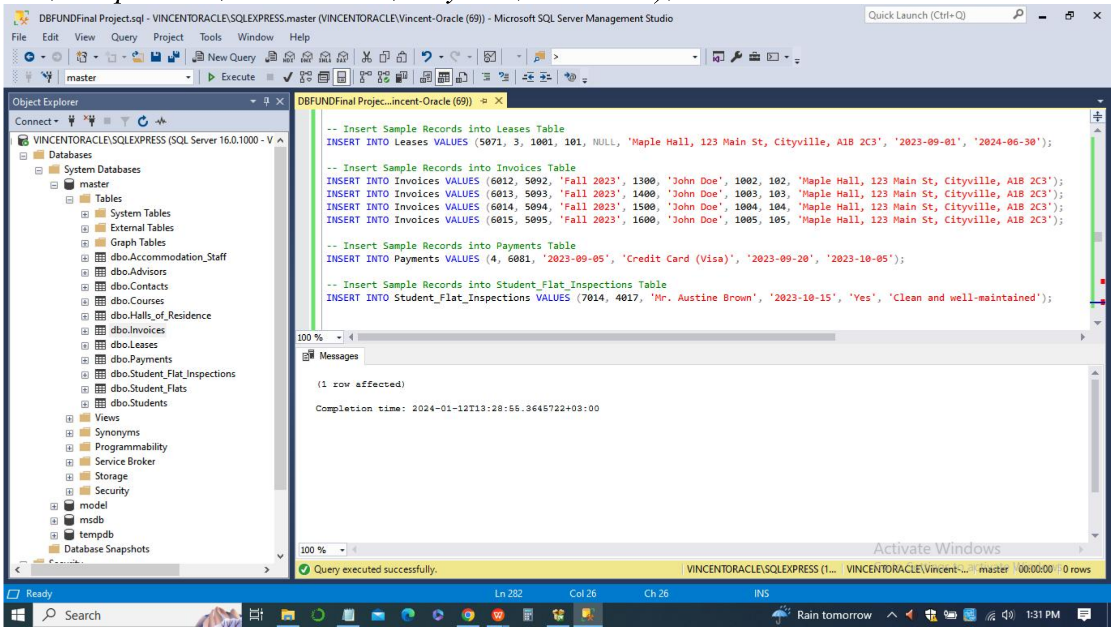


```
-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1004, 'Steve Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL,

-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5005, 7, 7009, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 3401, 'Fall 2022', 1400, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (2, 3014, '2023-08-21', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
```

```
Completion time: 2024-01-12T12:23:08.8342447+03:00
```

Query completed with errors.

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6001, 5001, 'Fall 2023', 1200, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');

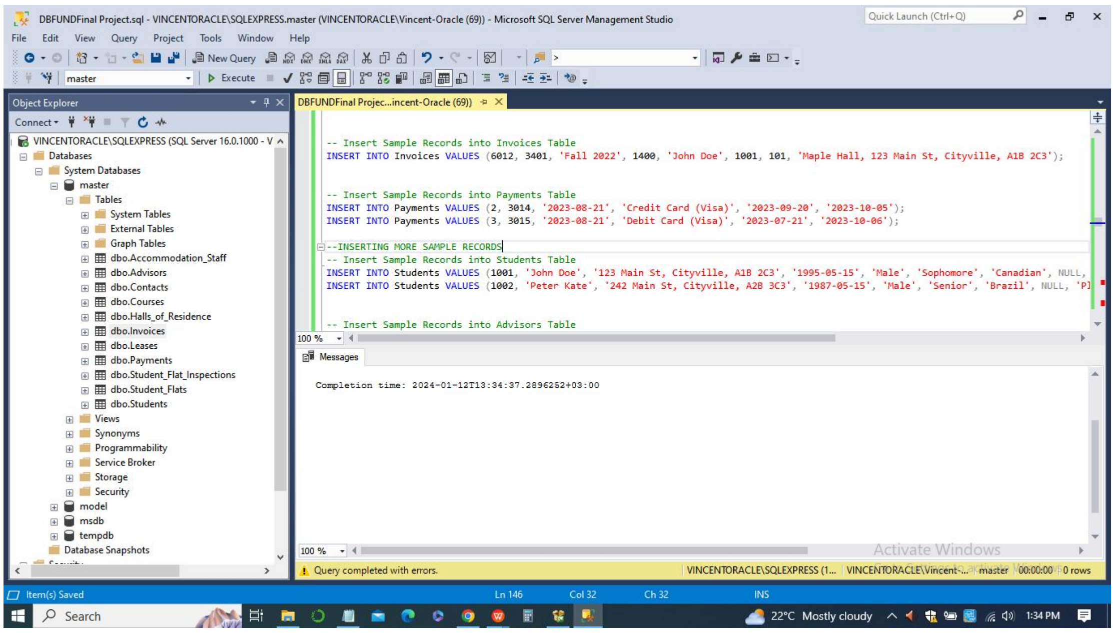


```
-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5071, 3, 1001, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 5092, 'Fall 2023', 1300, 'John Doe', 1002, 102, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6013, 5093, 'Fall 2023', 1400, 'John Doe', 1003, 103, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6014, 5094, 'Fall 2023', 1500, 'John Doe', 1004, 104, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6015, 5095, 'Fall 2023', 1600, 'John Doe', 1005, 105, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (4, 6081, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');

-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7014, 4017, 'Mr. Austine Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');
```

```
(1 row affected)

Completion time: 2024-01-12T13:28:55.3645722+03:00
```

Query executed successfully.

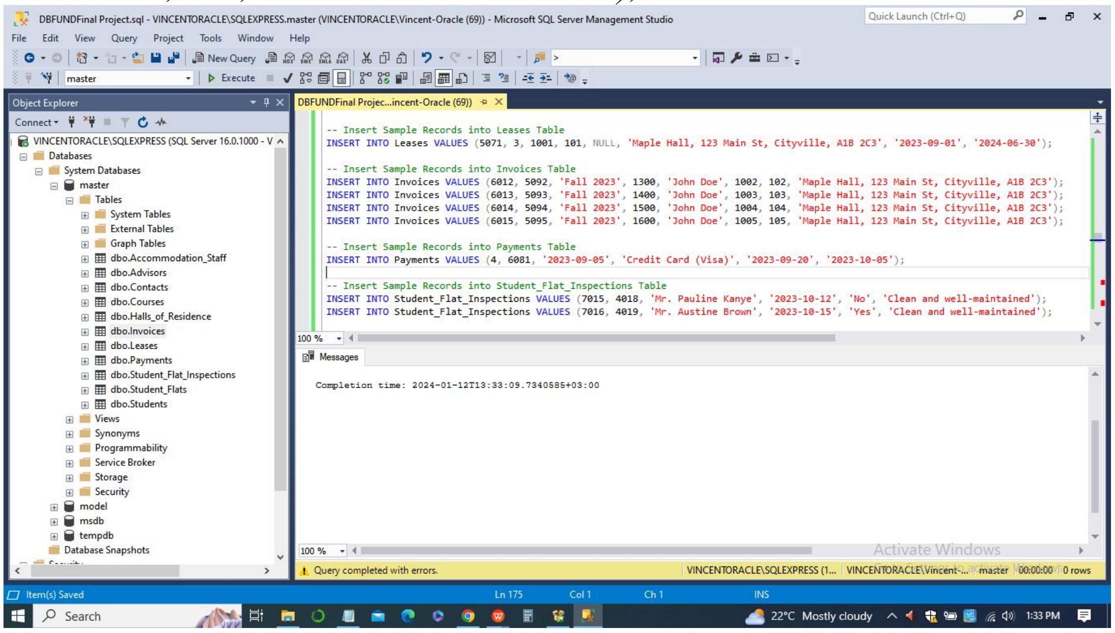
-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (1, 6001, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');



```
-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 3401, 'Fall 2022', 1400, 'John Doe', 1001, 101, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');


-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (2, 3014, '2023-08-21', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');
INSERT INTO Payments VALUES (3, 3015, '2023-08-21', 'Debit Card (Visa)', '2023-07-21', '2023-10-06');

--INSERTING MORE SAMPLE RECORDS
-- Insert Sample Records into Students Table
INSERT INTO Students VALUES (1001, 'John Doe', '123 Main St, Cityville, A1B 2C3', '1995-05-15', 'Male', 'Sophomore', 'Canadian', NULL,
INSERT INTO Students VALUES (1002, 'Peter Kate', '242 Main St, Cityville, A2B 3C3', '1987-05-15', 'Male', 'Senior', 'Brazil', NULL, 'P]


-- Insert Sample Records into Advisors Table
```

```
Completion time: 2024-01-12T13:34:37.2896252+03:00
```

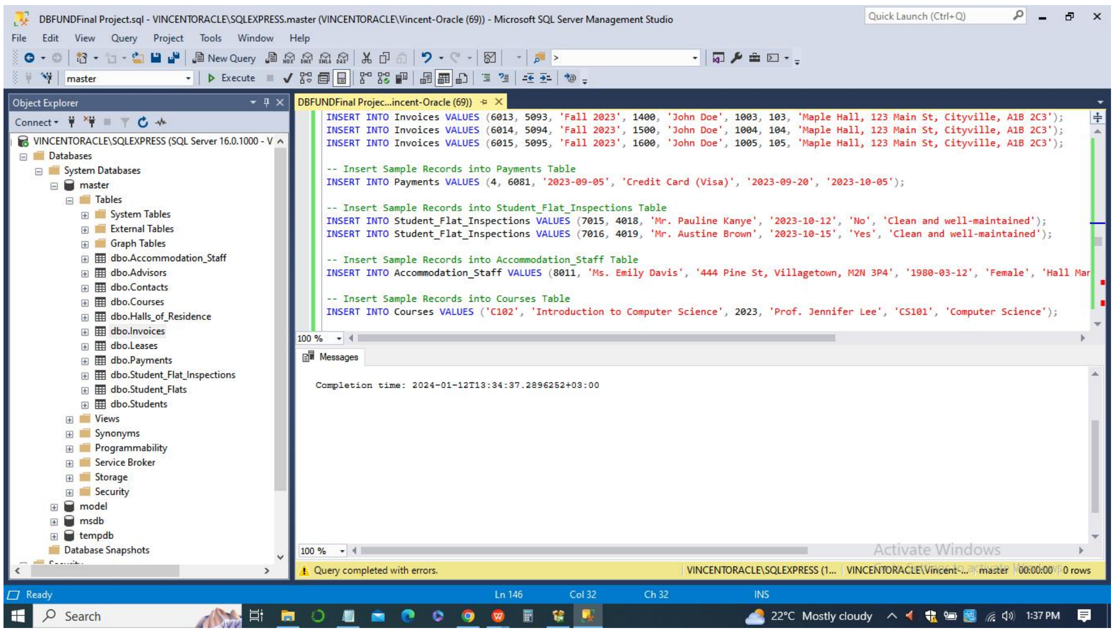
-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7001, 4001, 'Mr. James Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');



```
-- Insert Sample Records into Leases Table
INSERT INTO Leases VALUES (5071, 3, 1001, 101, NULL, 'Maple Hall, 123 Main St, Cityville, A1B 2C3', '2023-09-01', '2024-06-30');

-- Insert Sample Records into Invoices Table
INSERT INTO Invoices VALUES (6012, 5092, 'Fall 2023', 1300, 'John Doe', 1002, 102, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6013, 5093, 'Fall 2023', 1400, 'John Doe', 1003, 103, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6014, 5094, 'Fall 2023', 1500, 'John Doe', 1004, 104, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6015, 5095, 'Fall 2023', 1600, 'John Doe', 1005, 105, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (4, 6081, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');

-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7015, 4018, 'Mr. Pauline Kanye', '2023-10-12', 'No', 'Clean and well-maintained');
INSERT INTO Student_Flat_Inspections VALUES (7016, 4019, 'Mr. Austine Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');
```

```
Completion time: 2024-01-12T13:33:09.7340585+03:00
```

-- Insert Sample Records into Accommodation_Staff Table
INSERT INTO Accommodation_Staff VALUES (8001, 'Ms. Emily Davis', '444 Pine St, Villagetown, M2N 3P4', '1980-03-12', 'Female', 'Hall Manager', 'Maple Hall');

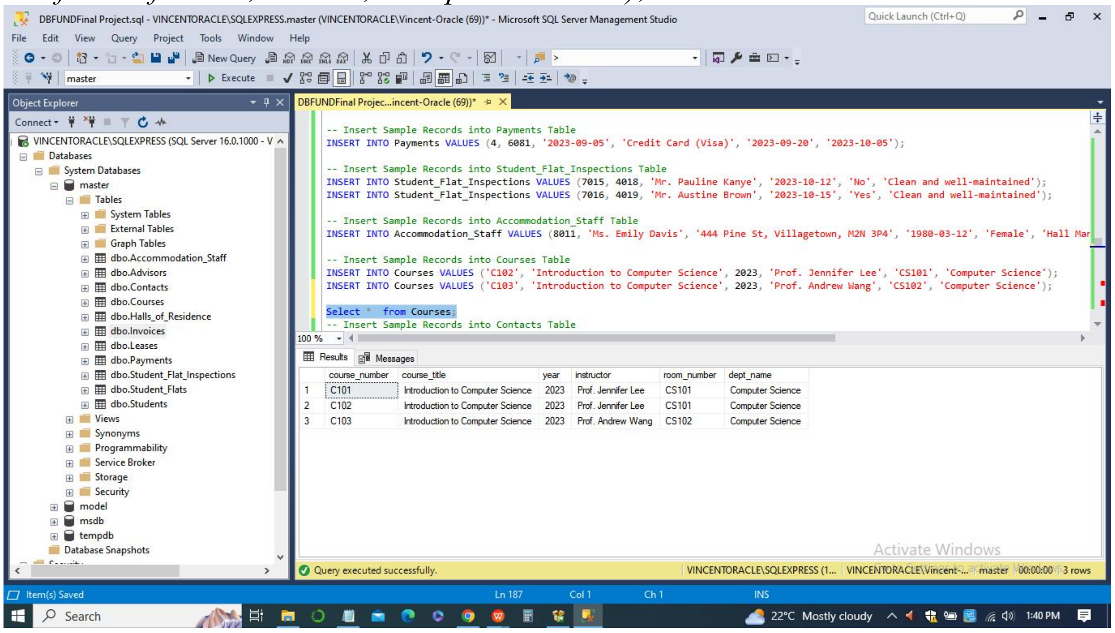


```
INSERT INTO Invoices VALUES (6013, 5093, 'Fall 2023', 1400, 'John Doe', 1003, 103, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6014, 5094, 'Fall 2023', 1500, 'John Doe', 1004, 104, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');
INSERT INTO Invoices VALUES (6015, 5095, 'Fall 2023', 1600, 'John Doe', 1005, 105, 'Maple Hall, 123 Main St, Cityville, A1B 2C3');

-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (4, 6081, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');

-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7015, 4018, 'Mr. Pauline Kanye', '2023-10-12', 'No', 'Clean and well-maintained');
INSERT INTO Student_Flat_Inspections VALUES (7016, 4019, 'Mr. Austine Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');

-- Insert Sample Records into Accommodation_Staff Table
INSERT INTO Accommodation_Staff VALUES (8011, 'Ms. Emily Davis', '444 Pine St, Villagetown, M2N 3P4', '1980-03-12', 'Female', 'Hall Mar

-- Insert Sample Records into Courses Table
INSERT INTO Courses VALUES ('C102', 'Introduction to Computer Science', 2023, 'Prof. Jennifer Lee', 'CS101', 'Computer Science');
```

```
Completion time: 2024-01-12T13:34:37.2896252+03:00
```

Query completed with errors.

-- Insert Sample Records into Courses Table
INSERT INTO Courses VALUES ('C101', 'Introduction to Computer Science', 2023, 'Prof. Jennifer Lee', 'CS101', 'Computer Science');

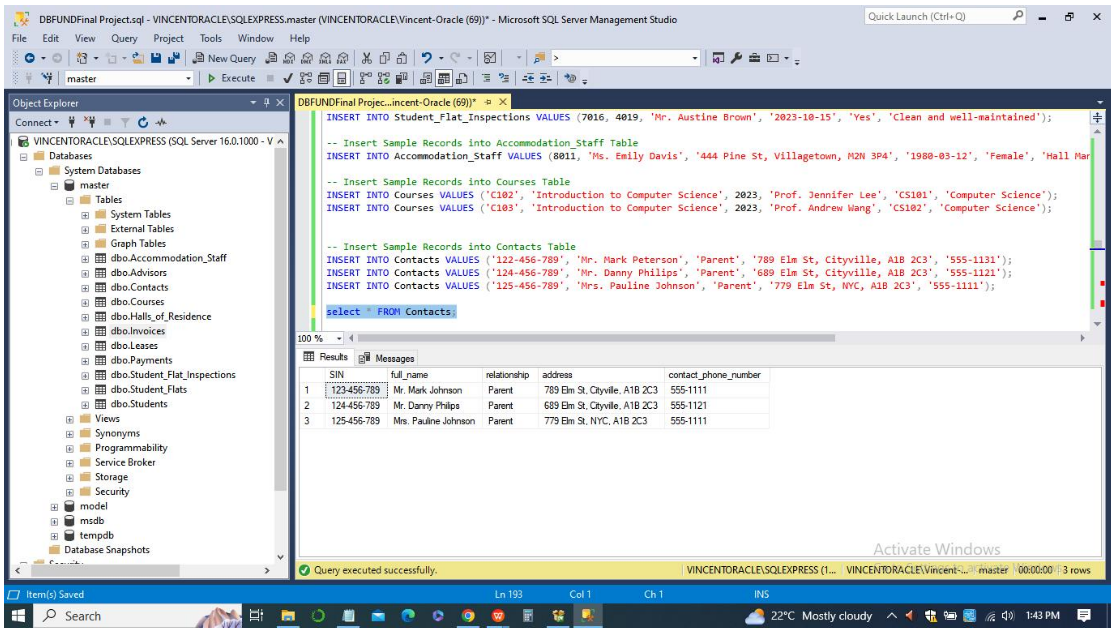


```
-- Insert Sample Records into Payments Table
INSERT INTO Payments VALUES (4, 6081, '2023-09-05', 'Credit Card (Visa)', '2023-09-20', '2023-10-05');

-- Insert Sample Records into Student_Flat_Inspections Table
INSERT INTO Student_Flat_Inspections VALUES (7015, 4018, 'Mr. Pauline Kanye', '2023-10-12', 'No', 'Clean and well-maintained');
INSERT INTO Student_Flat_Inspections VALUES (7016, 4019, 'Mr. Austine Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');

-- Insert Sample Records into Accommodation_Staff Table
INSERT INTO Accommodation_Staff VALUES (8011, 'Ms. Emily Davis', '444 Pine St, Villagetown, M2N 3P4', '1980-03-12', 'Female', 'Hall Mar

-- Insert Sample Records into Courses Table
INSERT INTO Courses VALUES ('C102', 'Introduction to Computer Science', 2023, 'Prof. Jennifer Lee', 'CS101', 'Computer Science');
INSERT INTO Courses VALUES ('C103', 'Introduction to Computer Science', 2023, 'Prof. Andrew Wang', 'CS102', 'Computer Science');

Select * from Courses;
-- Insert Sample Records into Contacts Table
```

	course_number	course_title	year	instructor	room_number	dept_name
1	C101	Introduction to Computer Science	2023	Prof. Jennifer Lee	CS101	Computer Science
2	C102	Introduction to Computer Science	2023	Prof. Jennifer Lee	CS101	Computer Science
3	C103	Introduction to Computer Science	2023	Prof. Andrew Wang	CS102	Computer Science

Query executed successfully.

-- Insert Sample Records into Contacts Table
INSERT INTO Contacts VALUES ('123-456-789', 'Mr. Mark Johnson', 'Parent', '789 Elm St, Cityville, A1B 2C3', '555-1111');

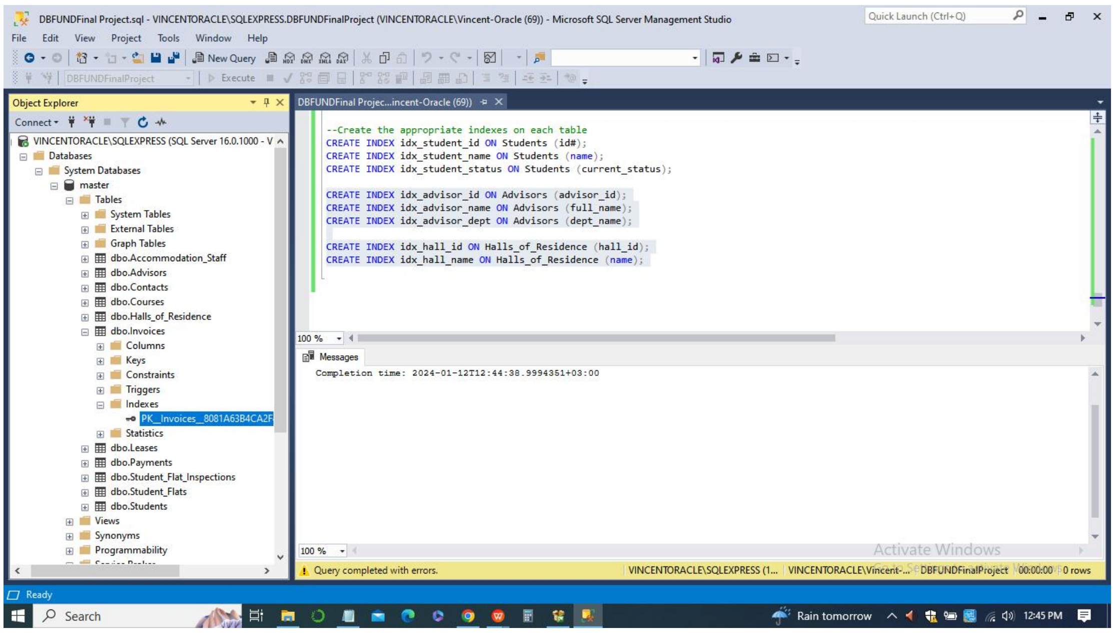


```
INSERT INTO Student_Flat_Inspections VALUES (7016, 4019, 'Mr. Austine Brown', '2023-10-15', 'Yes', 'Clean and well-maintained');

-- Insert Sample Records into Accommodation_Staff Table
INSERT INTO Accommodation_Staff VALUES (8011, 'Ms. Emily Davis', '444 Pine St, Villagetown, M2N 3P4', '1980-03-12', 'Female', 'Hall Mar

-- Insert Sample Records into Courses Table
INSERT INTO Courses VALUES ('C102', 'Introduction to Computer Science', 2023, 'Prof. Jennifer Lee', 'CS101', 'Computer Science');
INSERT INTO Courses VALUES ('C103', 'Introduction to Computer Science', 2023, 'Prof. Andrew Wang', 'CS102', 'Computer Science');


-- Insert Sample Records into Contacts Table
INSERT INTO Contacts VALUES ('122-456-789', 'Mr. Mark Peterson', 'Parent', '789 Elm St, Cityville, A1B 2C3', '555-1131');
INSERT INTO Contacts VALUES ('124-456-789', 'Mr. Danny Philips', 'Parent', '689 Elm St, Cityville, A1B 2C3', '555-1121');
INSERT INTO Contacts VALUES ('125-456-789', 'Mrs. Pauline Johnson', 'Parent', '779 Elm St, NYC, A1B 2C3', '555-1111');

select * FROM Contacts;
```

	SIN	full_name	relationship	address	contact_phone_number
1	123-456-789	Mr. Mark Johnson	Parent	789 Elm St, Cityville, A1B 2C3	555-1111
2	124-456-789	Mr. Danny Philips	Parent	689 Elm St, Cityville, A1B 2C3	555-1121
3	125-456-789	Mrs. Pauline Johnson	Parent	779 Elm St, NYC, A1B 2C3	555-1111

Query executed successfully.

d. Create the appropriate indexes on each table



```
--Create the appropriate indexes on each table
CREATE INDEX idx_student_id ON Students (id#);
CREATE INDEX idx_student_name ON Students (name);
CREATE INDEX idx_student_status ON Students (current_status);

CREATE INDEX idx_advisor_id ON Advisors (advisor_id);
CREATE INDEX idx_advisor_name ON Advisors (full_name);
CREATE INDEX idx_advisor_dept ON Advisors (dept_name);

CREATE INDEX idx_hall_id ON Halls_of_Residence (hall_id);
CREATE INDEX idx_hall_name ON Halls_of_Residence (name);
```

```
Completion time: 2024-01-12T12:44:38.9994351+03:00
```

Query completed with errors.

i. Students Table

CREATE INDEX idx_student_id ON Students (id#);

CREATE INDEX idx_student_name ON Students (name);

CREATE INDEX idx_student_status ON Students (current_status);

ii. Advisors Table

CREATE INDEX idx_advisor_id ON Advisors (advisor_id);

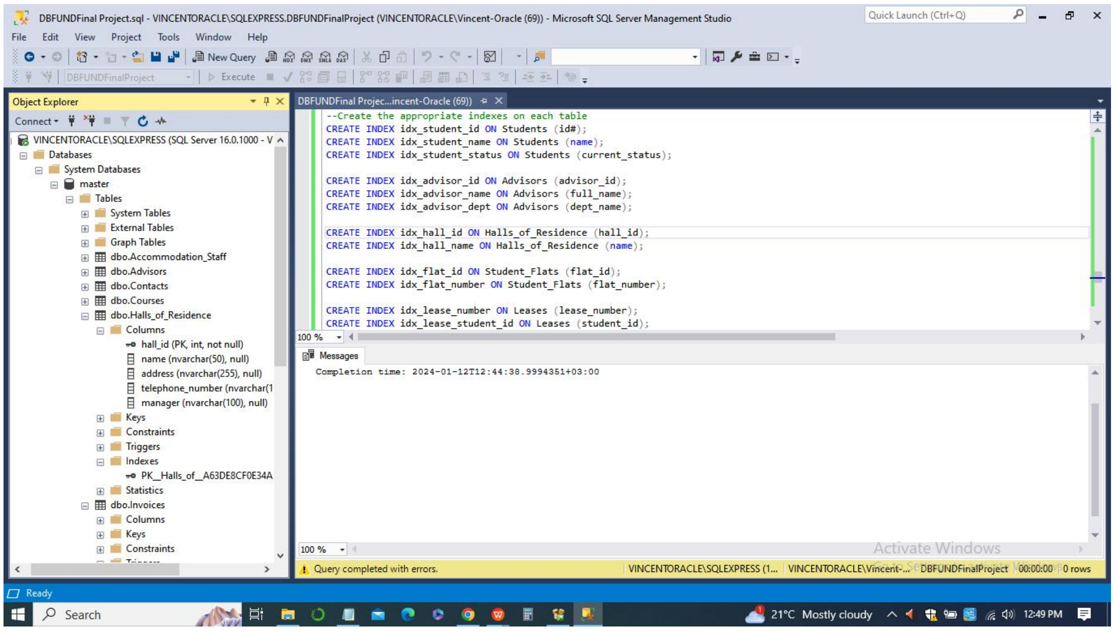
CREATE INDEX idx_advisor_name ON Advisors (full_name);

CREATE INDEX idx_advisor_dept ON Advisors (dept_name);

iii. Halls of Residence Table

CREATE INDEX idx_hall_id ON Halls_of_Residence (hall_id);

CREATE INDEX idx_hall_name ON Halls_of_Residence (name);



```
--Create the appropriate indexes on each table
CREATE INDEX idx_student_id ON Students (id#);
CREATE INDEX idx_student_name ON Students (name);
CREATE INDEX idx_student_status ON Students (current_status);

CREATE INDEX idx_advisor_id ON Advisors (advisor_id);
CREATE INDEX idx_advisor_name ON Advisors (full_name);
CREATE INDEX idx_advisor_dept ON Advisors (dept_name);

CREATE INDEX idx_hall_id ON Halls_of_Residence (hall_id);
CREATE INDEX idx_hall_name ON Halls_of_Residence (name);

CREATE INDEX idx_flat_id ON Student_Flats (flat_id);
CREATE INDEX idx_flat_number ON Student_Flats (flat_number);

CREATE INDEX idx_lease_number ON Leases (lease_number);
CREATE INDEX idx_lease_student_id ON Leases (student_id);
```

```
Completion time: 2024-01-12T12:44:38.9994351+03:00
```

Query completed with errors.

iv. Student Flats Table

CREATE INDEX idx_flat_id ON Student_Flats (flat_id);

CREATE INDEX idx_flat_number ON Student_Flats (flat_number);

v. Leases Table

CREATE INDEX idx_lease_number ON Leases (lease_number);

CREATE INDEX idx_lease_student_id ON Leases (student_id);

vi. Invoices Table

CREATE INDEX idx_invoice_number ON Invoices (invoice_number);

CREATE INDEX idx_invoice_student_id ON Invoices (student_id);

vii. Payments Table

CREATE INDEX idx_payment_invoice_number ON Payments (invoice_number);

viii. Student Flat Inspections Table

CREATE INDEX idx_inspection_id ON Student_Flat_Inspections (inspection_id);

CREATE INDEX idx_inspection_date ON Student_Flat_Inspections (inspection_date);

ix. Accommodation Staff Table

CREATE INDEX idx_staff_id ON Accommodation_Staff (staff_id);

CREATE INDEX idx_staff_name ON Accommodation_Staff (full_name);

x. Courses Table

CREATE INDEX idx_course_number ON Courses (course_number);

CREATE INDEX idx_course_title ON Courses (course_title);

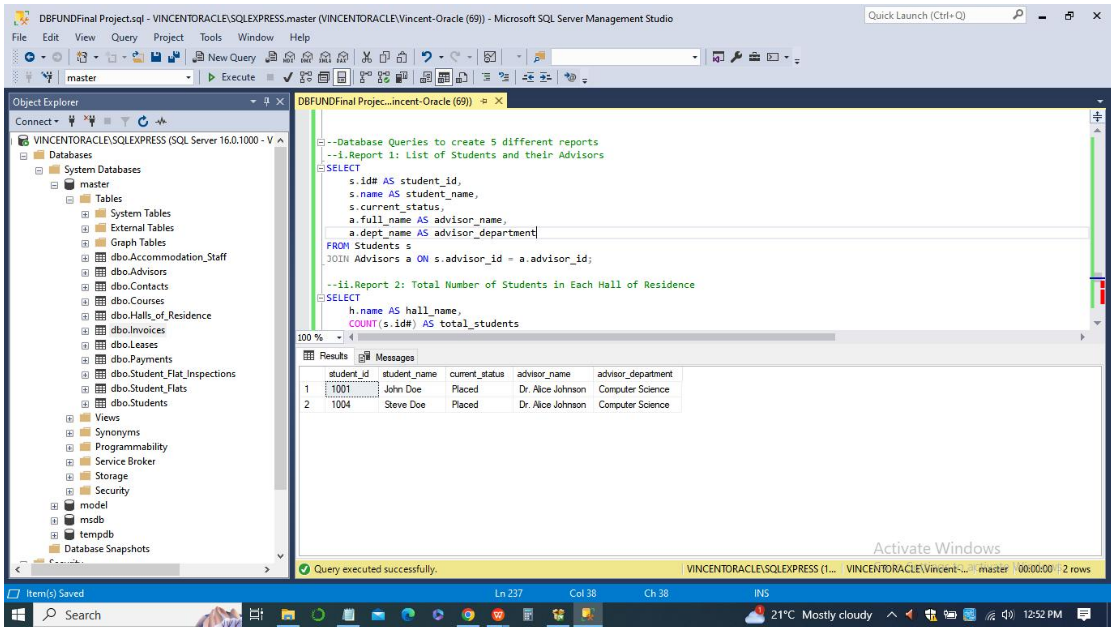
xi. Contacts Table

CREATE INDEX idx_contact_sin ON Contacts (SIN);

CREATE INDEX idx_contact_name ON Contacts (full_name);

e. Database Queries to create 5 different reports

i. Report 1: List of Students and their Advisors



```
--Database Queries to create 5 different reports
--i.Report 1: List of Students and their Advisors
SELECT
    s.id# AS student_id,
    s.name AS student_name,
    s.current_status,
    a.full_name AS advisor_name,
    a.dept_name AS advisor_department
FROM Students s
JOIN Advisors a ON s.advisor_id = a.advisor_id;

--ii.Report 2: Total Number of Students in Each Hall of Residence
SELECT
    h.name AS hall_name,
    COUNT(s.id#) AS total_students
```

	student_id	student_name	current_status	advisor_name	advisor_department
1	1001	John Doe	Placed	Dr. Alice Johnson	Computer Science
2	1004	Steve Doe	Placed	Dr. Alice Johnson	Computer Science

Query executed successfully.

SELECT

s.id# AS student_id,

s.name AS student_name,

s.current_status,

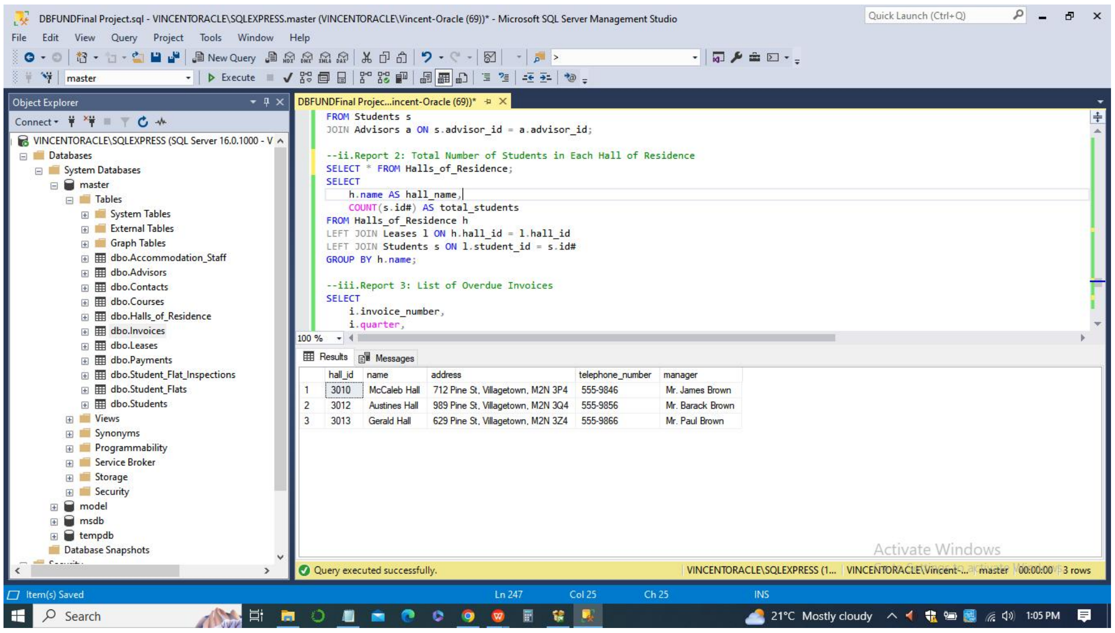
a.full_name AS advisor_name,

a.dept_name AS advisor_department

FROM Students s

JOIN Advisors a ON s.advisor_id = a.advisor_id;

ii. Report 2: Total Number of Students in Each Hall of Residence



```
FROM Students s
JOIN Advisors a ON s.advisor_id = a.advisor_id;

--ii.Report 2: Total Number of Students in Each Hall of Residence
SELECT * FROM Halls_of_Residence;
SELECT
    h.name AS hall_name,
    COUNT(s.id#) AS total_students
FROM Halls_of_Residence h
LEFT JOIN Leases l ON h.hall_id = l.hall_id
LEFT JOIN Students s ON l.student_id = s.id#
GROUP BY h.name;

--iii.Report 3: List of Overdue Invoices
SELECT
    i.invoice_number,
    i.quarter,
```

	hall_id	name	address	telephone_number	manager
1	3010	McCaleb Hall	712 Pine St, Villagetown, M2N 3P4	555-9846	Mr. James Brown
2	3012	Austines Hall	989 Pine St, Villagetown, M2N 3Q4	555-9856	Mr. Barack Brown
3	3013	Gerald Hall	629 Pine St, Villagetown, M2N 3Z4	555-9866	Mr. Paul Brown

Query executed successfully.

SELECT

h.name AS hall_name,

COUNT(s.id#) AS total_students

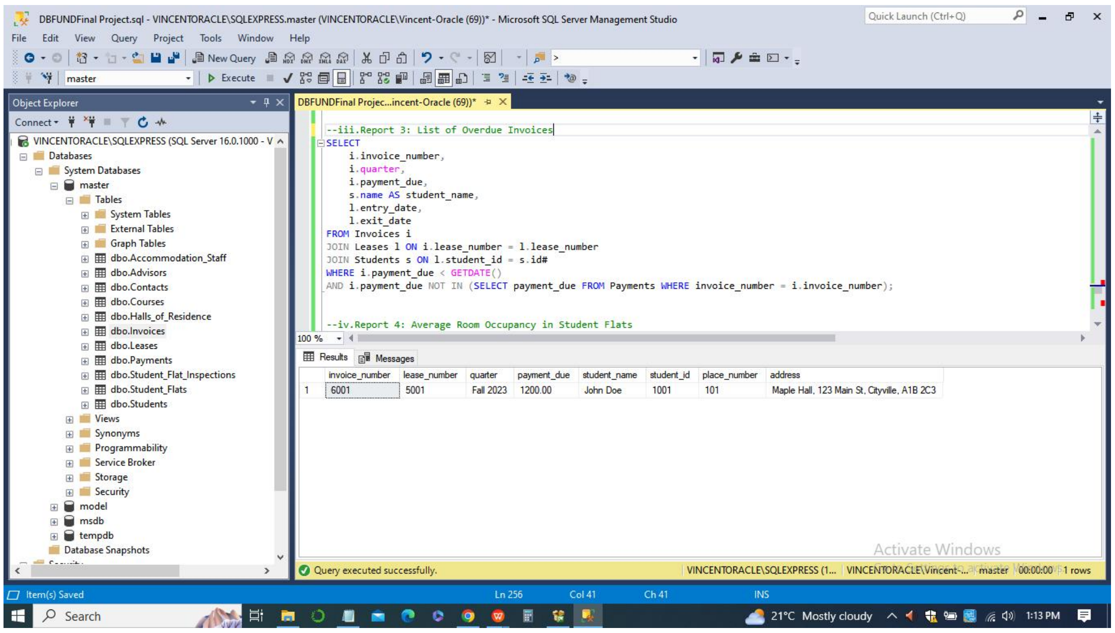
FROM Halls_of_Residence h

LEFT JOIN Leases l ON h.hall_id = l.hall_id

LEFT JOIN Students s ON l.student_id = s.id#

GROUP BY h.name;

iii. Report 3: List of Overdue Invoices



```
--iii.Report 3: List of Overdue Invoices
SELECT
    i.invoice_number,
    i.quarter,
    i.payment_due,
    s.name AS student_name,
    l.entry_date,
    l.exit_date
FROM Invoices i
JOIN Leases l ON i.lease_number = l.lease_number
JOIN Students s ON l.student_id = s.id#
WHERE i.payment_due < GETDATE()
AND i.payment_due NOT IN (SELECT payment_due FROM Payments WHERE invoice_number = i.invoice_number);


--iv.Report 4: Average Room Occupancy in Student Flats
```

	invoice_number	lease_number	quarter	payment_due	student_name	student_id	place_number	address
1	6001	5001	Fall 2023	1200.00	John Doe	1001	101	Maple Hall, 123 Main St, Cityville, A1B 2C3

Query executed successfully.

SELECT

i.invoice_number,

i.quarter,

i.payment_due,

s.name AS student_name,

l.entry_date,

l.exit_date

FROM Invoices i

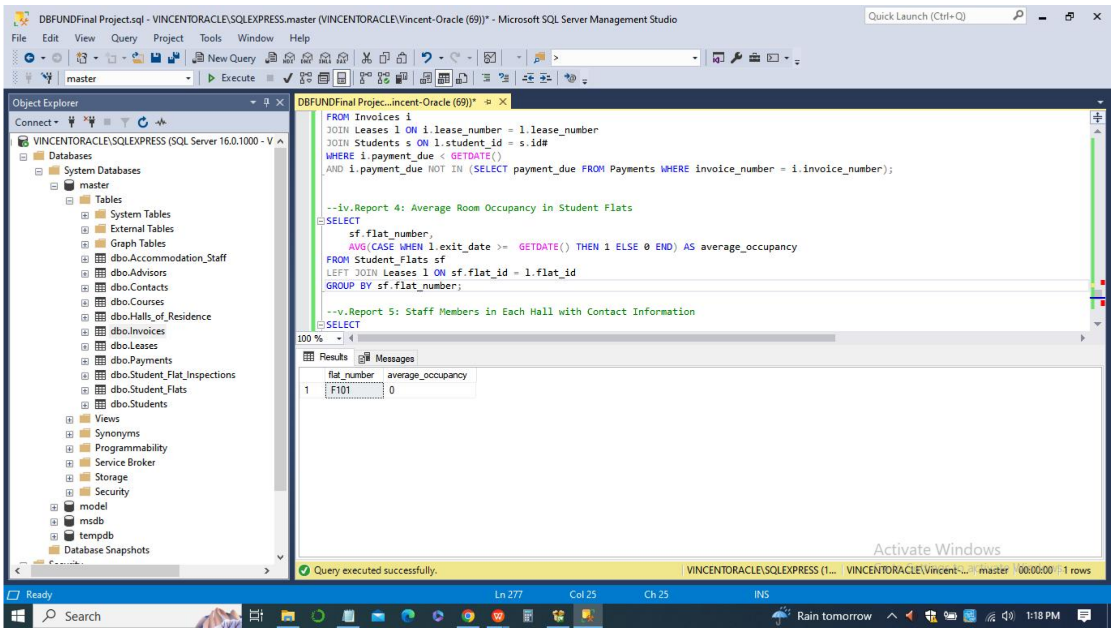
JOIN Leases l ON i.lease_number = l.lease_number

JOIN Students s ON l.student_id = s.id#

WHERE i.payment_due < GETDATE()

AND i.payment_due NOT IN (SELECT payment_due FROM Payments WHERE invoice_number = i.invoice_number);

iv. Report 4: Average Room Occupancy in Student Flats



```
FROM Invoices i
JOIN Leases l ON i.lease_number = l.lease_number
JOIN Students s ON l.student_id = s.id#
WHERE i.payment_due < GETDATE()
AND i.payment_due NOT IN (SELECT payment_due FROM Payments WHERE invoice_number = i.invoice_number);


--iv.Report 4: Average Room Occupancy in Student Flats
SELECT
    sf.flat_number,
    AVG(CASE WHEN l.exit_date >=  GETDATE() THEN 1 ELSE 0 END) AS average_occupancy
FROM Student_Flats sf
LEFT JOIN Leases l ON sf.flat_id = l.flat_id
GROUP BY sf.flat_number;

--v.Report 5: Staff Members in Each Hall with Contact Information
SELECT
```

```
    flat_number  average_occupancy
1   F101         0
```

```
Query executed successfully.
```

SELECT

sf.flat_number,

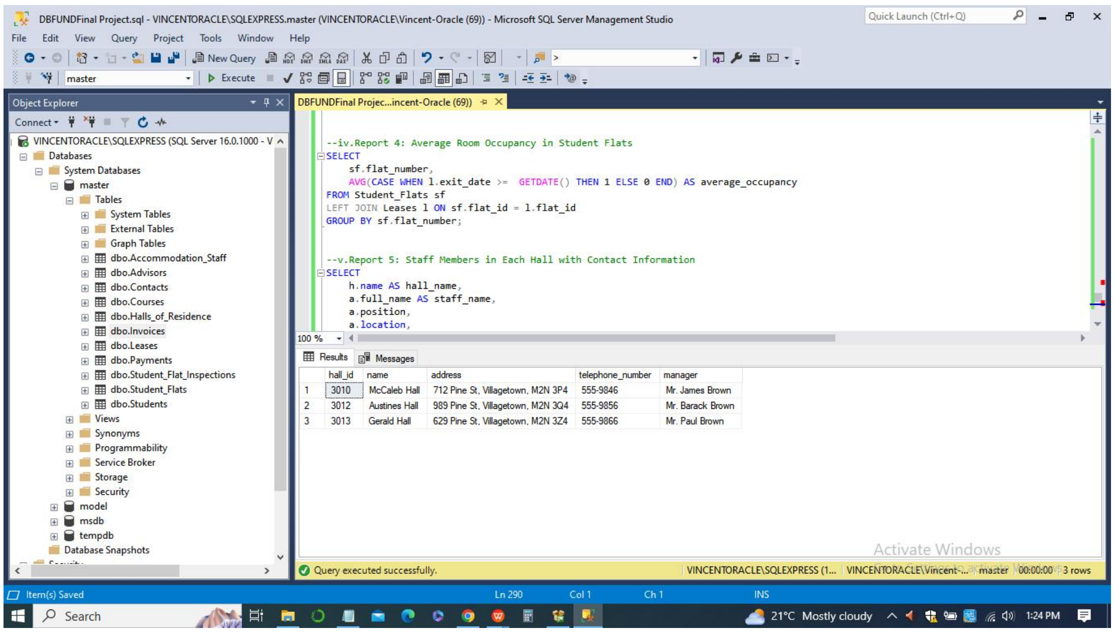
AVG(CASE WHEN l.exit_date >= GETDATE() THEN 1 ELSE 0 END) AS average_occupancy

FROM Student_Flats sf

LEFT JOIN Leases l ON sf.flat_id = l.flat_id

GROUP BY sf.flat_number;

v. Report 5: Staff Members in Each Hall with Contact Information



```
--iv.Report 4: Average Room Occupancy in Student Flats
SELECT
    sf.flat_number,
    AVG(CASE WHEN l.exit_date >=  GETDATE() THEN 1 ELSE 0 END) AS average_occupancy
FROM Student_Flats sf
LEFT JOIN Leases l ON sf.flat_id = l.flat_id
GROUP BY sf.flat_number;


--v.Report 5: Staff Members in Each Hall with Contact Information
SELECT
    h.name AS hall_name,
    a.full_name AS staff_name,
    a.position,
    a.location,
```

	hall_id	name	address	telephone_number	manager
1	3010	McCaleb Hall	712 Pine St, Villagetown, M2N 3P4	555-9846	Mr. James Brown
2	3012	Austines Hall	989 Pine St, Villagetown, M2N 3Q4	555-9856	Mr. Barack Brown
3	3013	Gerald Hall	629 Pine St, Villagetown, M2N 3Z4	555-9866	Mr. Paul Brown

Query executed successfully.

SELECT

h.name AS hall_name,

a.full_name AS staff_name,

a.position,

a.location,

a.phone_number

FROM Halls_of_Residence h

JOIN Accommodation_Staff a ON h.hall_id = a.hall_id;