AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH

Faculty of Science and Technology

Project Title: AIRPORT MANAGEMENT SYSTEM

Course Name: INTRODUCTION TO DATABASE Date of Submission: 26/12/2020

Section: A Course Code: CSC 2108

Semester: FALL 2020-21 [Final Term] Course Teacher: KAWSER IROM RUSHEE

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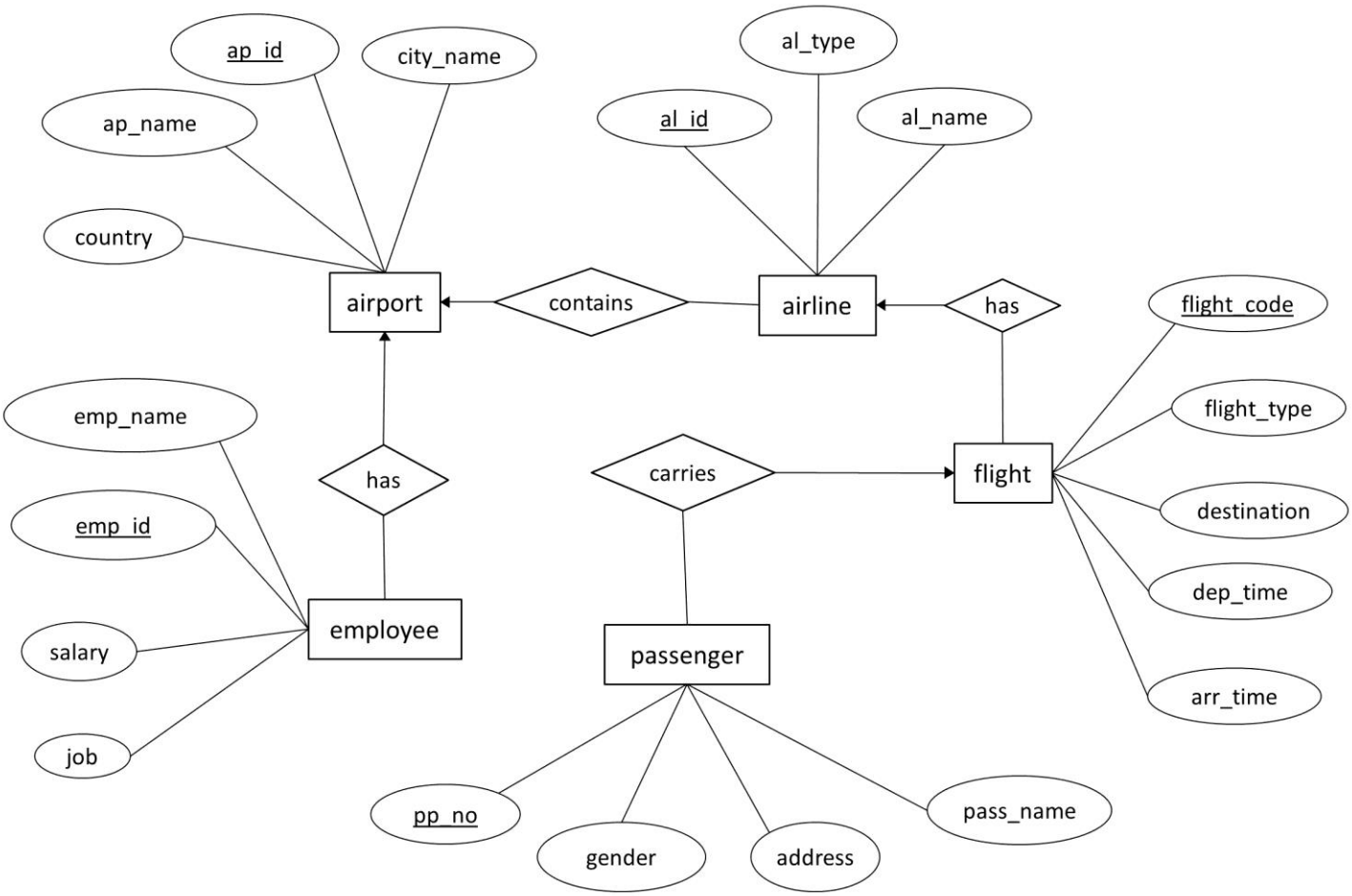
Case Scenario:

In Bangladesh, there is a plan of creating an airport management system where people can travel easily. The airport is identified by airport id which is the primary key, every airport has a name, city and country. The airport contains many airline company where the airline has unique airline id, it also has airline name and the type of the airline. Each airline has many flights . The flight has unique flight code, it also has destination, departure time, flight type, arrival time. Each flight contains many passengers and the passengers are individually identified by passenger id, passenger name, gender and address. The airport has many employees who are uniquely identified by employee id, employee name, job and salary.

ER Diagram:


ap_id
city_name
ap_name
country
airport
contains
al_type
al_id
al_name
airline
has
flight_code
flight_type
destination
dep_time
arr_time
flight
carries
emp_name
has
emp_id
salary
job
employee
passenger
pp_no
gender
address
pass_name

Normalisation:

airport-1--------has--------*employee

UNF:
ap_id, ap_name, city_name, country, emp_id, emp_name, salary, job

1NF: There is no multi valued attribute relation, so it is already in 1NF.
ap_id, ap_name, city_name, country, emp_id, emp_name, salary, job

2NF:
1. ap_id, ap_name, city_name, country
2. emp_id, emp_name, salary, job

3NF:
1. ap_id, ap_name
2. city_name, country
3. emp_id, emp_name
4. salary, job

Table Creation:
1. ap_id, ap_name, (city_name)
2. city_name, country
3. emp_id, emp_name, (job),(ap_id)
4. salary, job

airport -1---------contain----------*airline

UNF:
ap_id, ap_name, city_name, country, al_id, al_type, al_name

1NF: There is no multi valued attribute relation, so it is already in 1NF.
ap_id, ap_name, city_name, country, al_id, al_type, al_name

2NF:
1. ap_id, ap_name, city_name, country
2. al_id, al_type, al_name

3NF:
1. ap_id, ap_name,
2. city_name, country
3. al_id, al_type, al_name

Table Creation:
1. ap_id, ap_name, (city_name)
2. city_name, country
3. al_id, , al_name, al_type, (ap_id)

airline-1----------has----------*flight

UNF:
al_id, al_type, al_name, flight_code, flight_type, destination, dep_time, arr_time

1NF: There is no multi valued attribute relation, so already in 1NF.
al_id, al_type, al_name, flight_code, flight_type, destination, dep_time, arr_time

2NF:
1. al_id, al_type, al_name
2. flight_code, flight_type, destination, dep_time, arr_time

3NF:
1. al_id, al_type, al_name
2. flight_code, flight_type, destination, dep_time, arr_time

Table Creation:
1. al_id, al_type, al_name,
2. flight_code, flight_type, destination, dep_time, arr_time, (al_id)

flight-1---------contains----------*passenger

UNF:
flight_code, flight_type, destination, dep_time, arr_time
pp_no, pass_name, gender, address

1NF: There is no multi valued attribute relation, so already in 1NF.
pp_no, gender, address, pass_name, flight_code, flight_type, destination, dep_time, arr_time

2NF:
1. pp_no, gender, address, pass_name
2. flight_code, flight_type, destination, dep_time, arr_time

3NF:
1. pp_no, gender, address, pass_name
2. flight_code, flight_type, destination, dep_time, arr_time

Table Creation:
1. pp_no, gender, address, pass_name, (flight_code)
2. flight_code, flight_type, destination, dep_time, arr_time

Table

1. ap_id, ap_name, (city_name)
2. city_name, country
3. emp_id, emp_name, (job),(ap_id)
4. salary, job

5. ~~ap_id, ap_name, (city_name)~~
6. ~~city_name, country~~
7. al_id, al_type, al_name, (ap_id)

8. ~~al_id, al_type, al_name,~~
9. flight_code, flight_type, destination, dep_time, arr_time, (al_id)

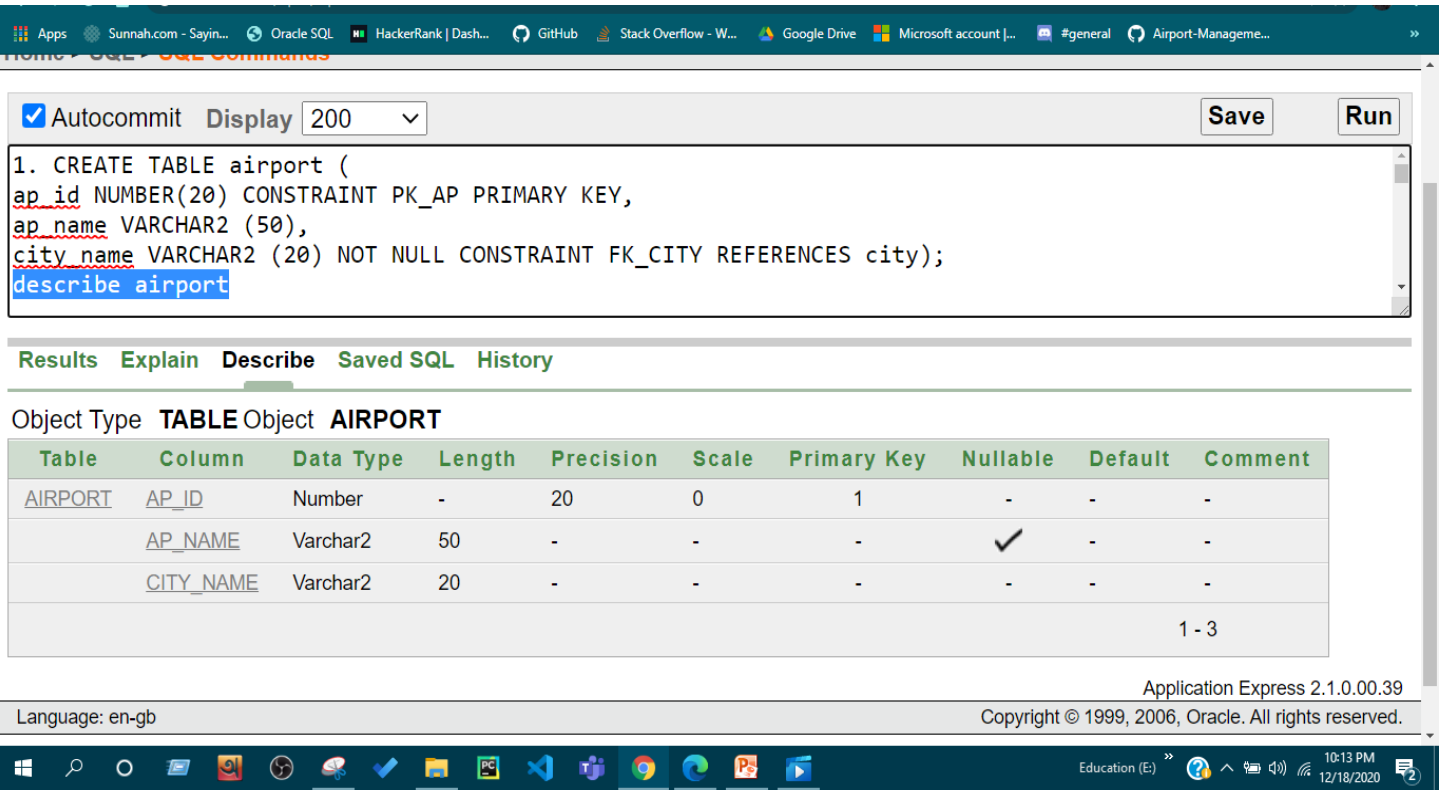
10. pp_no, gender, address, pass_name, (flight_code)
11. ~~flight_code, flight_type, destination, dep_time, arr_time~~

Final Table

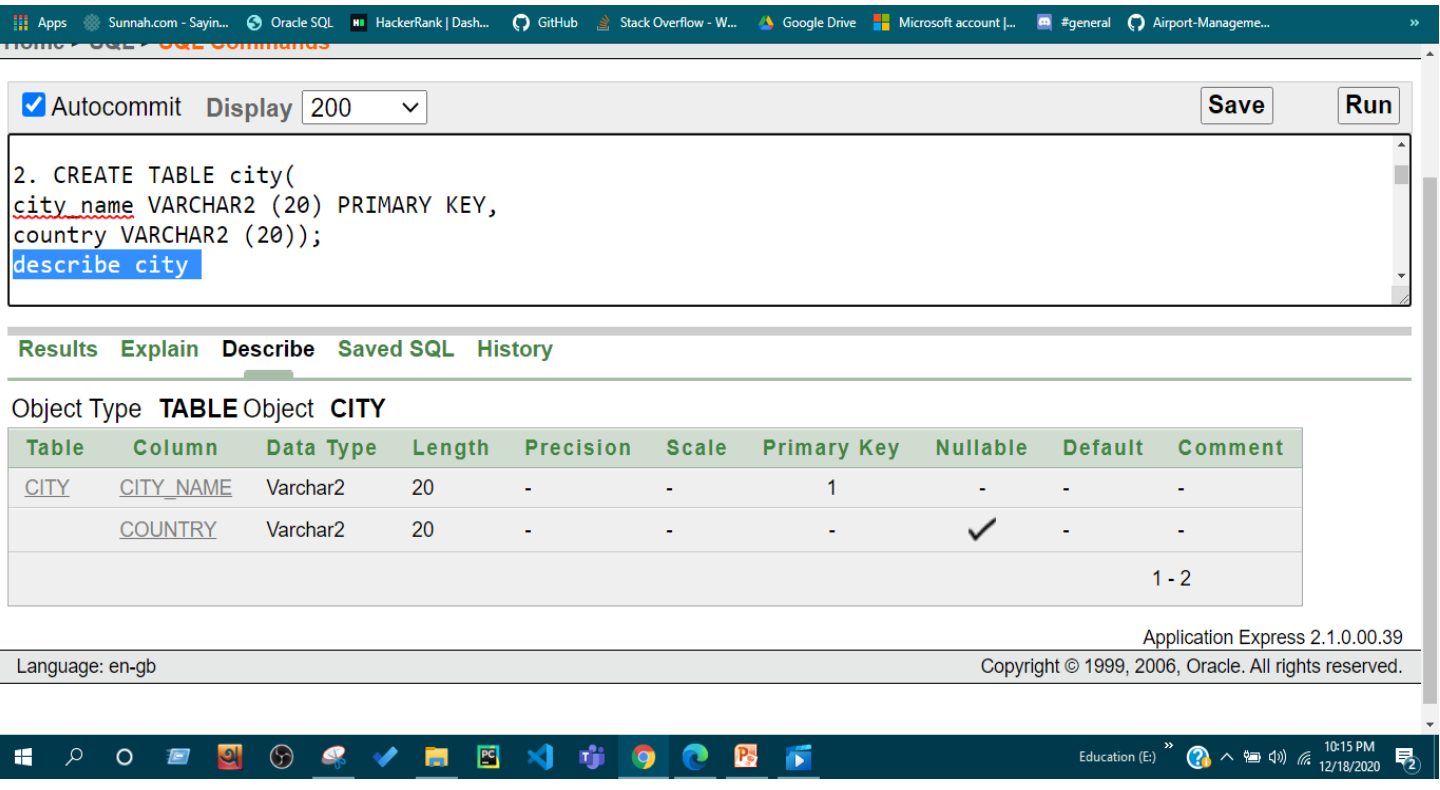
1. ap_id, ap_name, (city_name)
2. city_name, country
3. emp_id, emp_name, (job),(ap_id)
4. salary, job
5. al_id, , al_name, al_type (ap_id)
6. flight_code, flight_type, destination, dep_time, arr_time, (al_id)
7. pp_no, gender, address, pass_name, (flight_code)

Table Creation

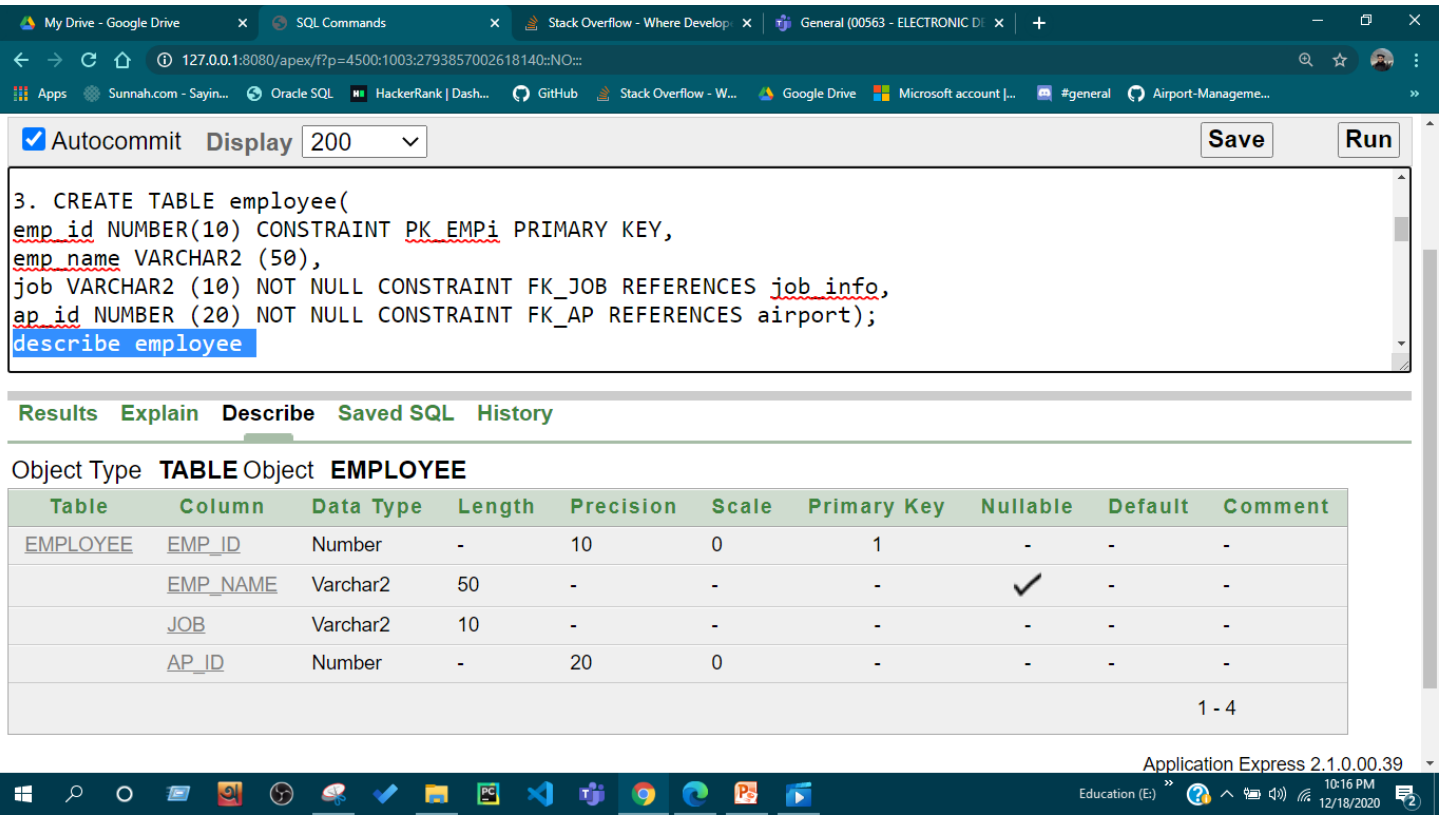
1. CREATE TABLE airport (ap_id NUMBER(20) CONSTRAINT PK_AP PRIMARY KEY, ap_name VARCHAR2 (50), city_name VARCHAR2 (20) NOT NULL CONSTRAINT FK_CITY REFERENCES city);



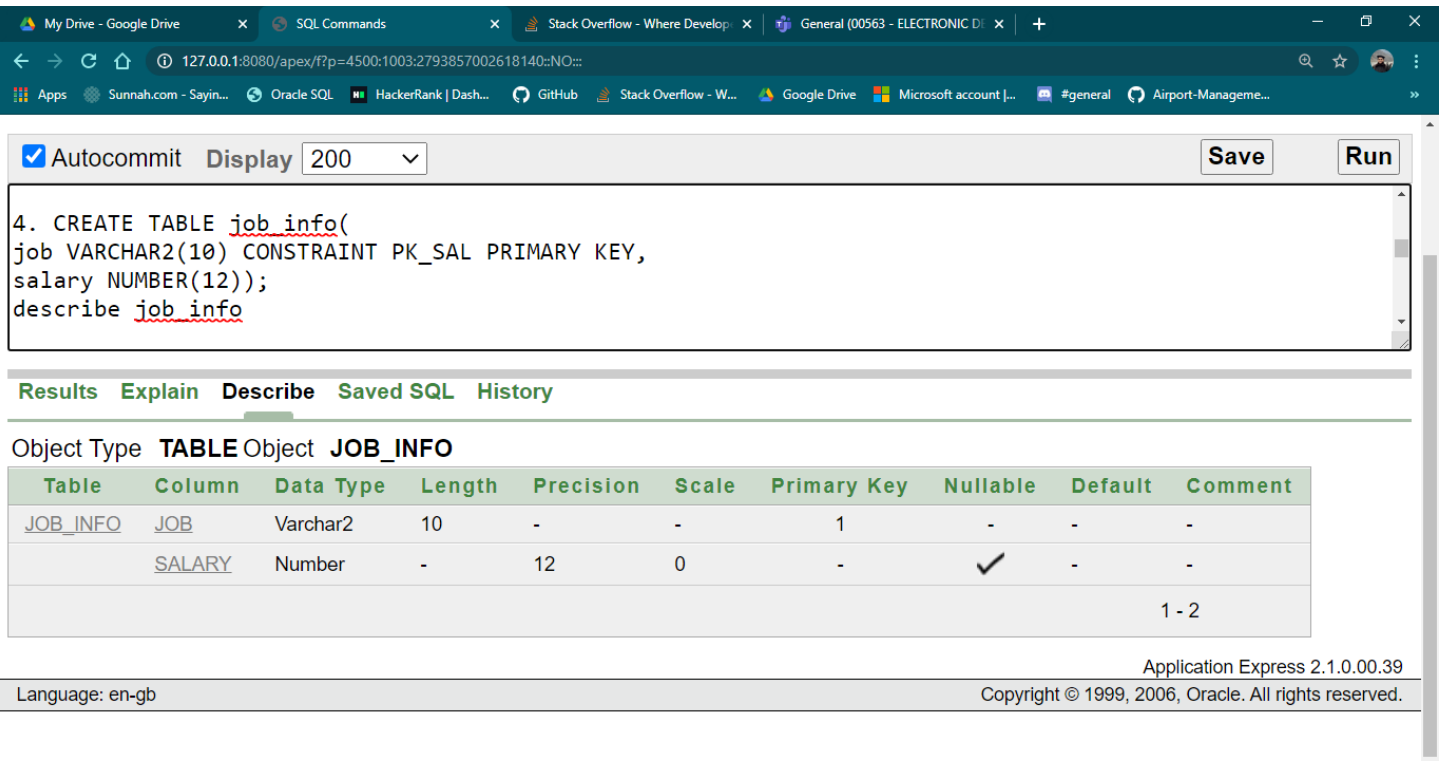
2. CREATE TABLE city(city_name VARCHAR2 (20) PRIMARY KEY, country VARCHAR2 (20));



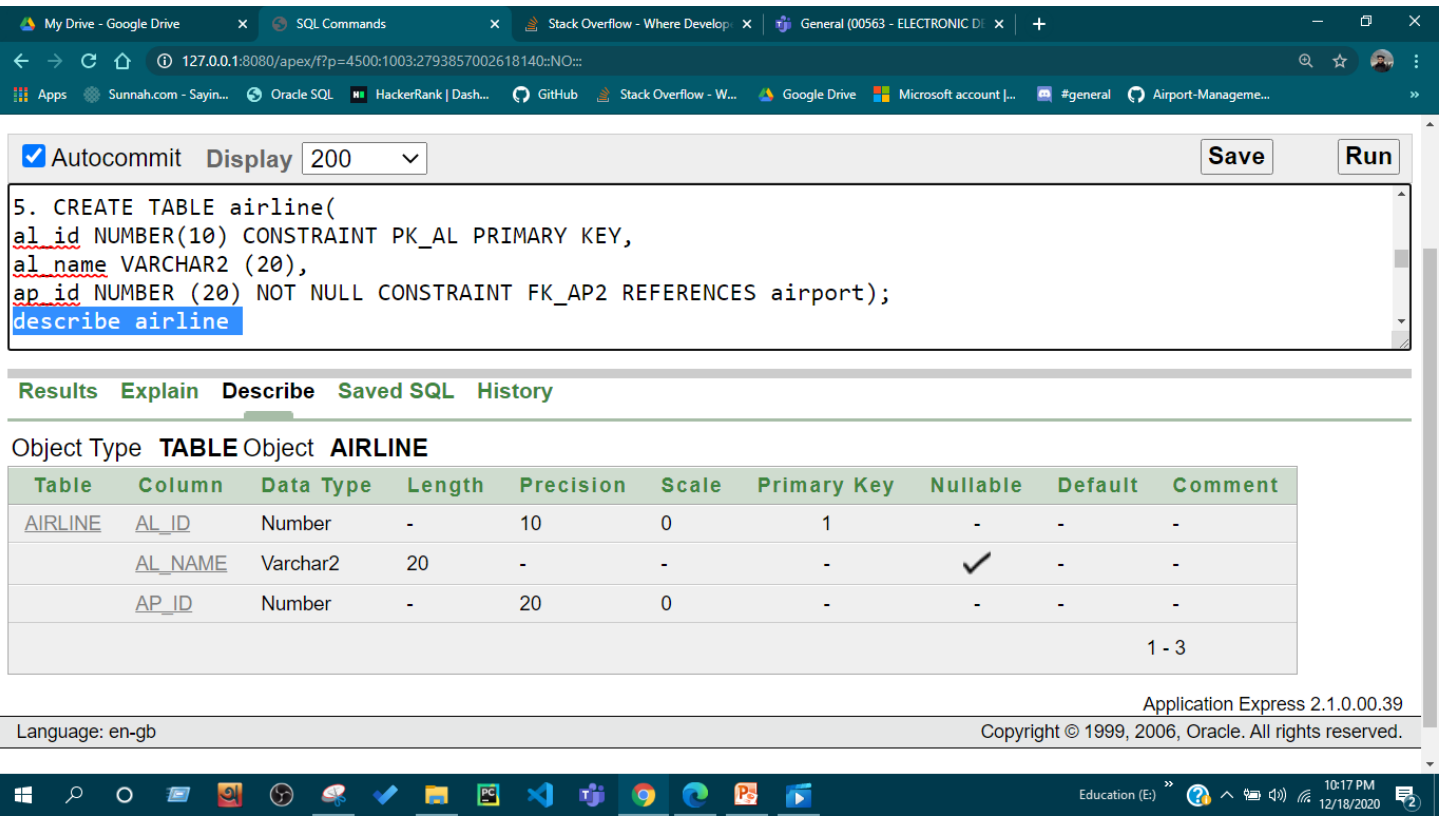
3. CREATE TABLE employee(emp_id NUMBER(10) CONSTRAINT PK_EMPi PRIMARY KEY, emp_name VARCHAR2 (50), mgr NUMBER(10), job VARCHAR2 (10) NOT NULL CONSTRAINT FK_JOB REFERENCES job_info, ap_id NUMBER (20) NOT NULL CONSTRAINT FK_AP REFERENCES airport);



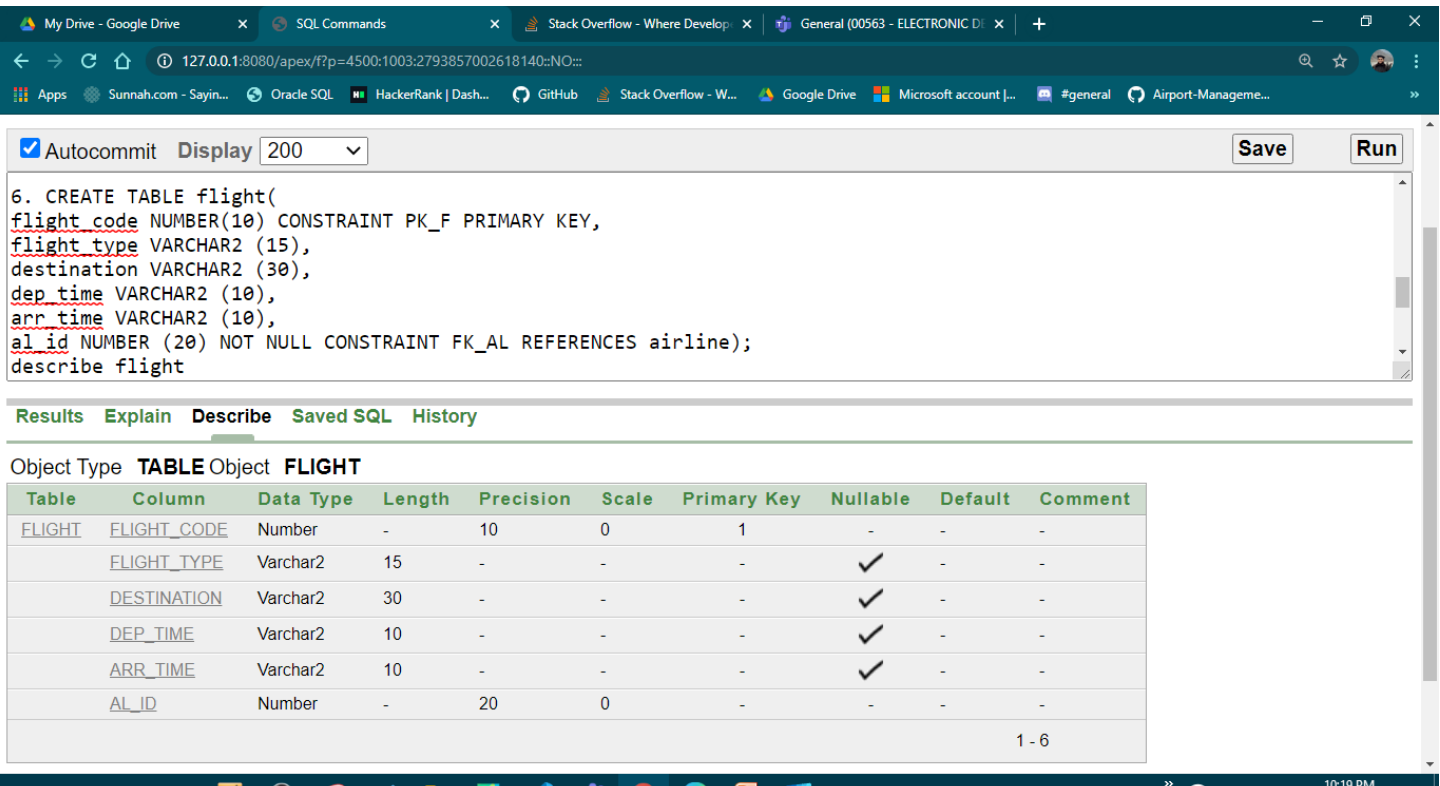
4. CREATE TABLE job_info(job VARCHAR2(10) CONSTRAINT PK_SAL PRIMARY KEY, salary NUMBER(12));



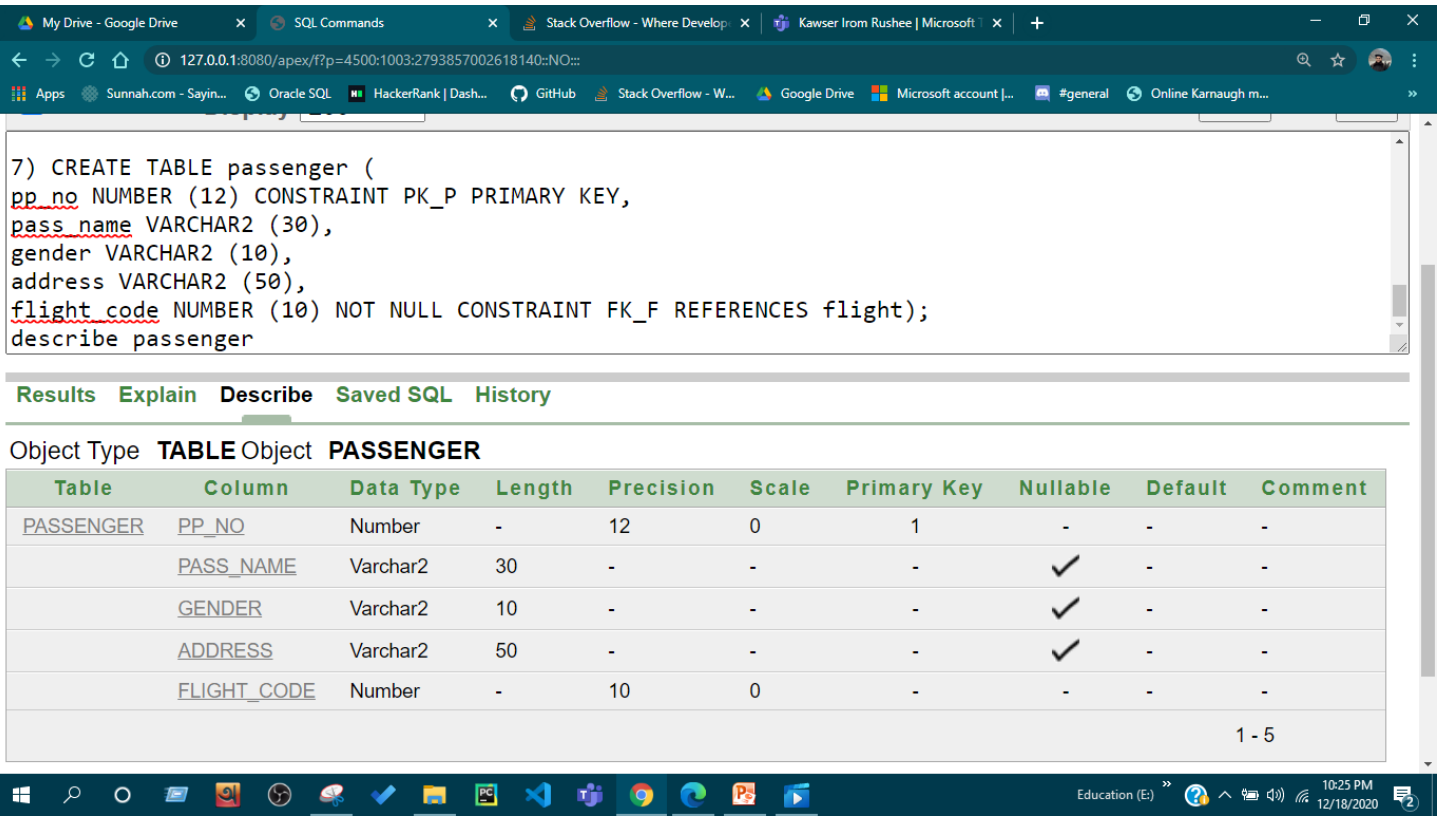
5. CREATE TABLE airline(al_id NUMBER(10) CONSTRAINT PK_AL PRIMARY KEY, al_name VARCHAR2 (20), al_type VARCHAR2 (15), ap_id NUMBER (20) NOT NULL CONSTRAINT FK_AP2 REFERENCES airport);



6. CREATE TABLE flight(flight_code NUMBER(10) CONSTRAINT PK_F PRIMARY KEY, flight_type VARCHAR2 (15), destination VARCHAR2 (30), arr_time VARCHAR2 (10), dep_time VARCHAR2 (10), dep_date DATE, al_id NUMBER (20) NOT NULL CONSTRAINT FK_AL REFERENCES airline);



7) CREATE TABLE passenger (pp_no NUMBER (12) CONSTRAINT PK_P PRIMARY KEY, pass_name VARCHAR2 (30), gender VARCHAR2 (10), address VARCHAR2 (50), flight_code NUMBER (10) NOT NULL CONSTRAINT FK_F REFERENCES flight);



Data Insertion

1. Airport

INSERT INTO airport VALUES
(10,'Shahjalal Int. Airport','Dhaka');
INSERT INTO airport VALUES
(20,'Shah Amanat Int. Airport','Chattogram');
INSERT INTO airport VALUES
(30,'Osmani Int. Airport','Sylhet');

2. City:

```
INSERT INTO city VALUES
('Dhaka', 'Bangladesh');
INSERT INTO city VALUES
('Chattogram', 'Bangladesh');
INSERT INTO city VALUES
('Sylhet', 'Bangladesh');
```

3. Job_Info:

```
INSERT INTO job_info VALUES
('Manager', 200000);
INSERT INTO job_info VALUES
('Cleaner', 18000);
INSERT INTO job_info VALUES
('Director', 500000);
INSERT INTO job_info VALUES
('Pilot', 500000);
```

4. Employee:

```
INSERT INTO employee VALUES
(101, 'Ahmad',NULL, 'Director', 10);
INSERT INTO employee VALUES
(117, 'Imtiaz', NULL, 'Cleaner', 20);
INSERT INTO employee VALUES
(118, 'Hasan',117, 'Cleaner', 20);
INSERT INTO employee VALUES
(102, 'Meha',101, 'Manager', 30);
INSERT INTO employee VALUES
(103, 'Ahsan',102, 'Pilot', 30);
```

5. Airline:

```
INSERT INTO airline VALUES
(111,'Bangladesh Biman','International',10);
INSERT INTO airline VALUES
(222,'Fly Emirates', 'International',20);
INSERT INTO airline VALUES
(333,'Novoair', 'Domestic', 30);
INSERT INTO airline VALUES
(444,'Air Bangladesh', 'Domestic', 30);
```

6. Flight:

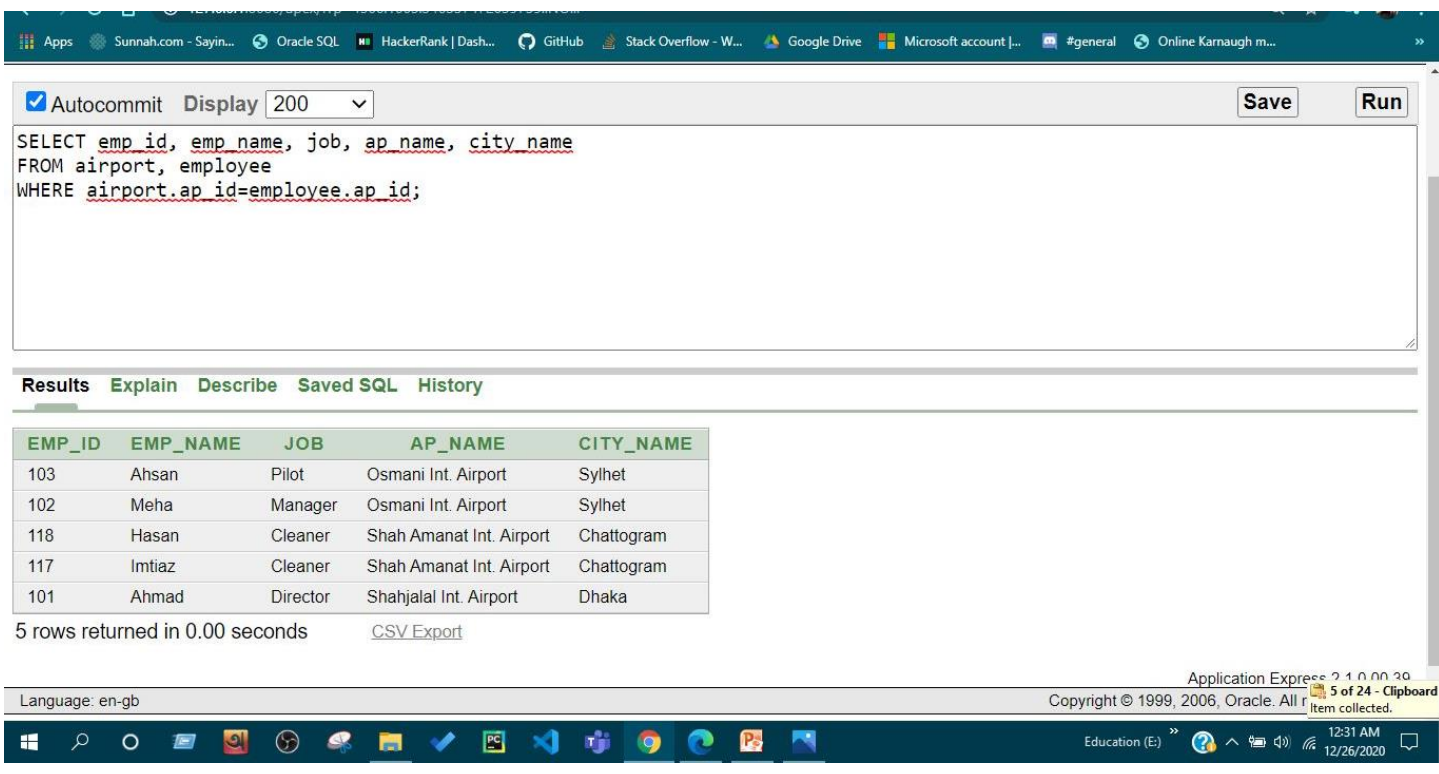
```
INSERT INTO flight VALUES
(177,'Buisness class','Bern', '7:00 AM', '8:15 AM', '26-Dec-2020',
222);
INSERT INTO flight VALUES
(277,'Buisness class', 'Manchester', '5:00 PM', '5:45 PM', '27-Dec-
2020', 111);
INSERT INTO flight VALUES
(377,'Economy Class', 'Saidpur Airport', '11:00 AM', '12:15 AM',
'28-Dec-2020', 333);
INSERT INTO flight VALUES
(477,'First class','Sylhet', '2:00 PM', '5:35 PM','31-Dec-2020',
444);
INSERT INTO flight VALUES
(577,'First class','Jessore', '1:00 PM', '3:35 PM','05-Jan-2021',
333);
INSERT INTO flight VALUES
(777,'Economy Class','Dhaka', '11:00 AM', '11:45 AM', '29-Dec-
2020', 222);
```

7. Passenger:

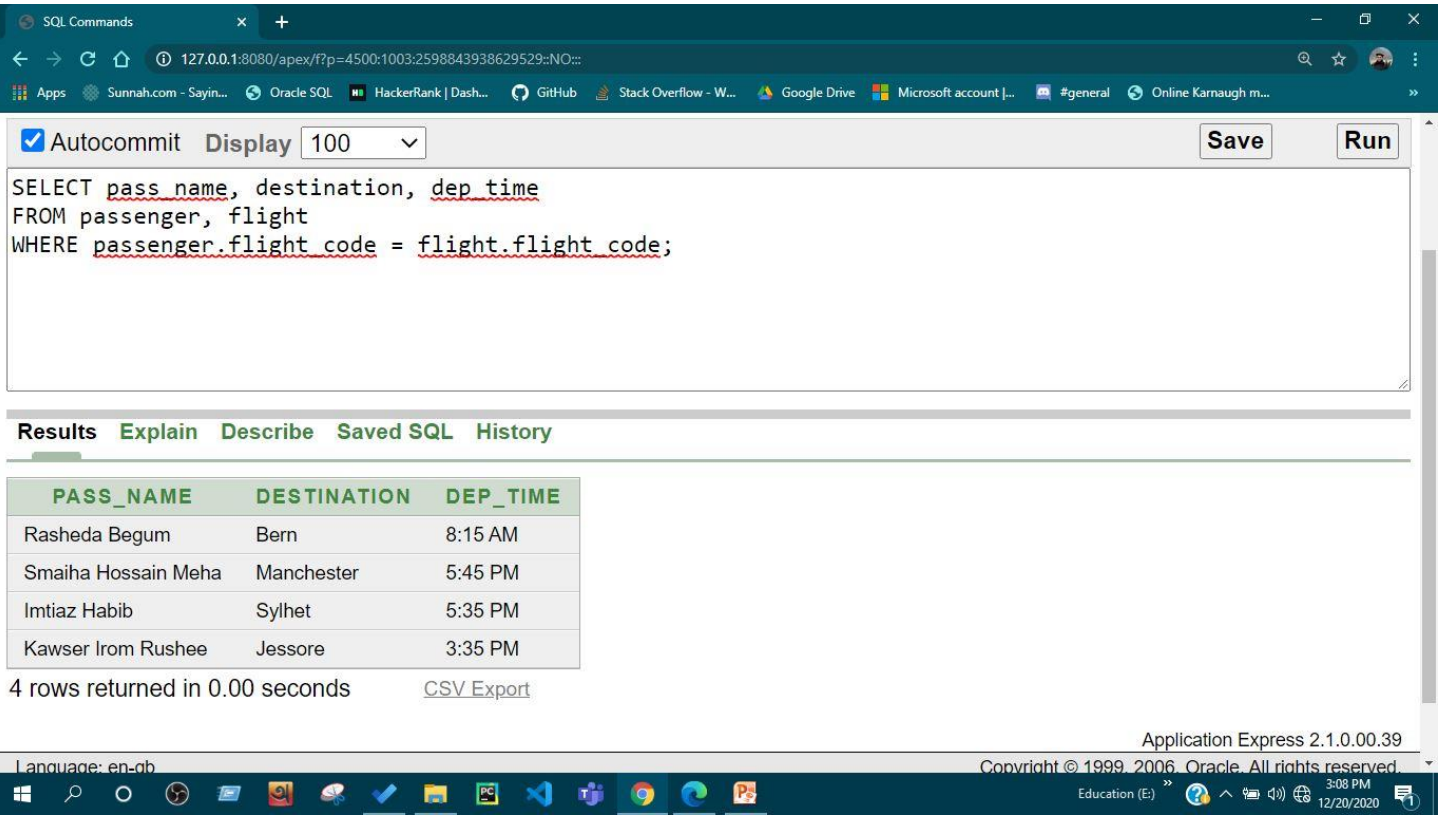
```
INSERT INTO passenger VALUES
(100001,'Kawser Irom Rushee','Female', 'Jessore', 577);
INSERT INTO passenger VALUES
(200001,'Imtiaz Habib','Male', 'Rajbari', 477);
INSERT INTO passenger VALUES
(300001,'Rasheda Begum','Female', 'Munshiganj', 177);
INSERT INTO passenger VALUES
(400001,'Smaiha Hossain Meha','Female', 'Dhaka', 277);
INSERT INTO passenger VALUES
(500001,'Ikram Khan','Male', 'Dhaka', 277);
INSERT INTO passenger VALUES
(600001,'Abdullah', 'Male', 'Dhaka', 277);
```

Joining

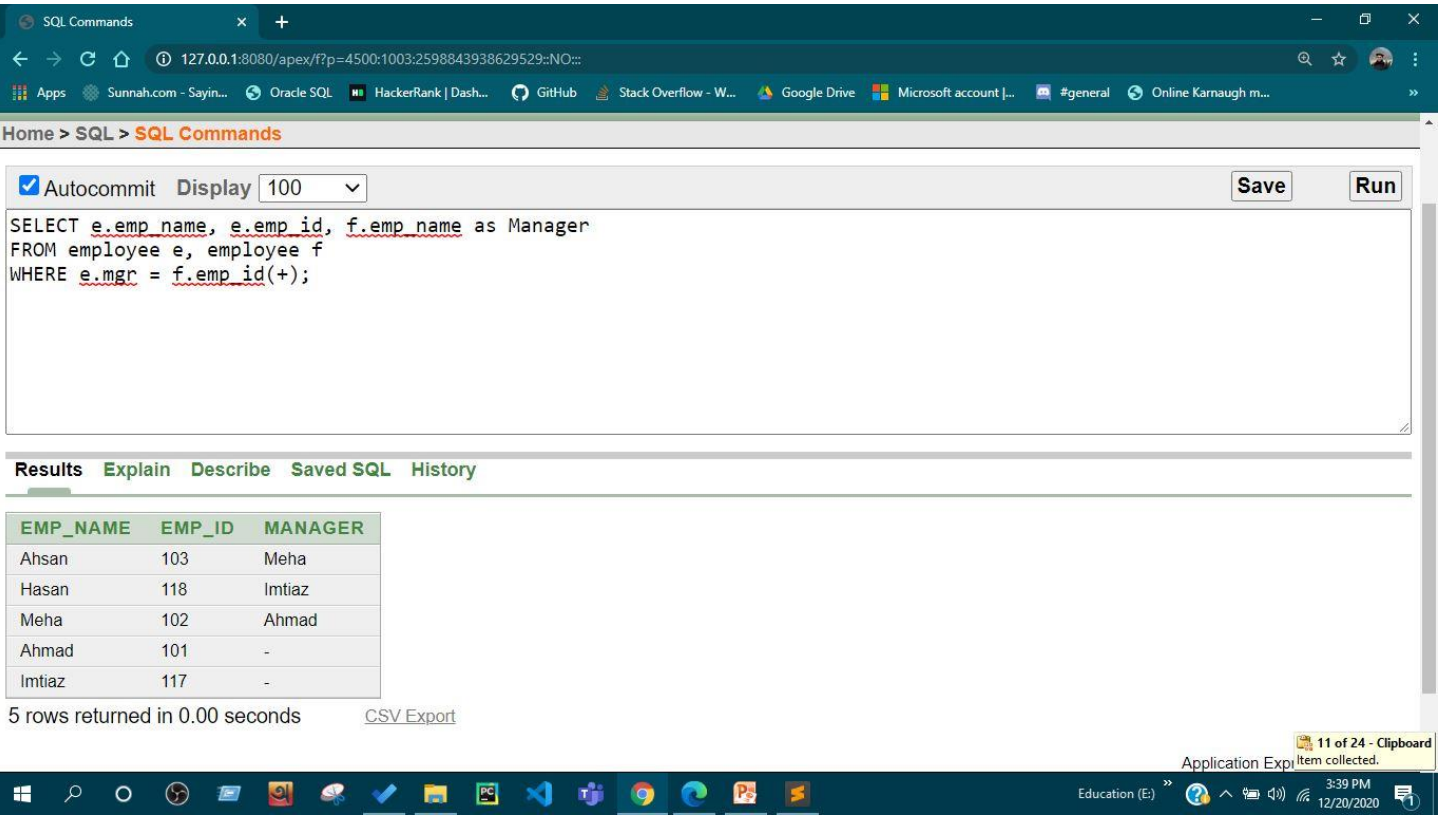
1. Equijoin: Display employee id, name, job and which airport they work at, in which city from airport and employee table



2. Equijoin: Display the passengers names, destinations and departure time from passenger and flight table

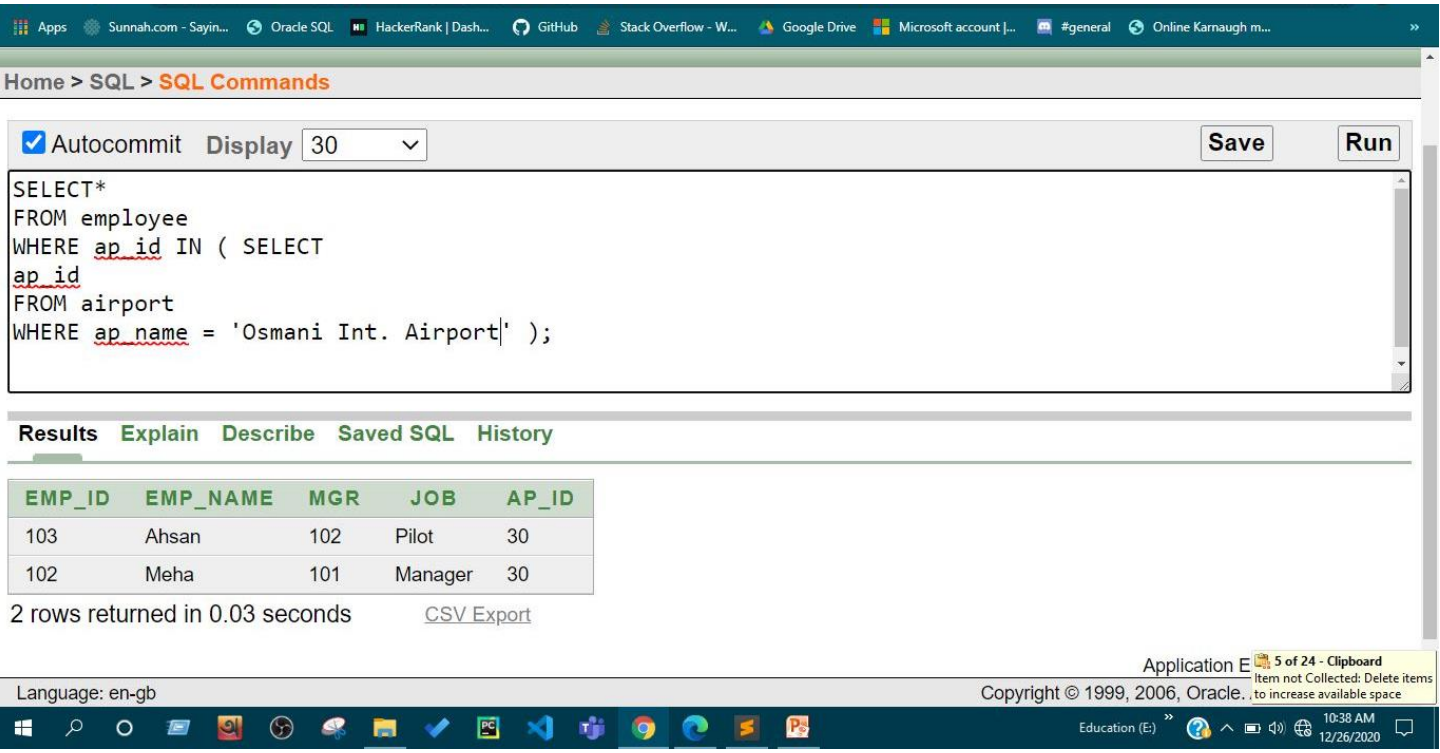


3. Self-join and Outer join: Display the employee name, employee id and their manager names, also display all the employee names and ids who do not have manager.

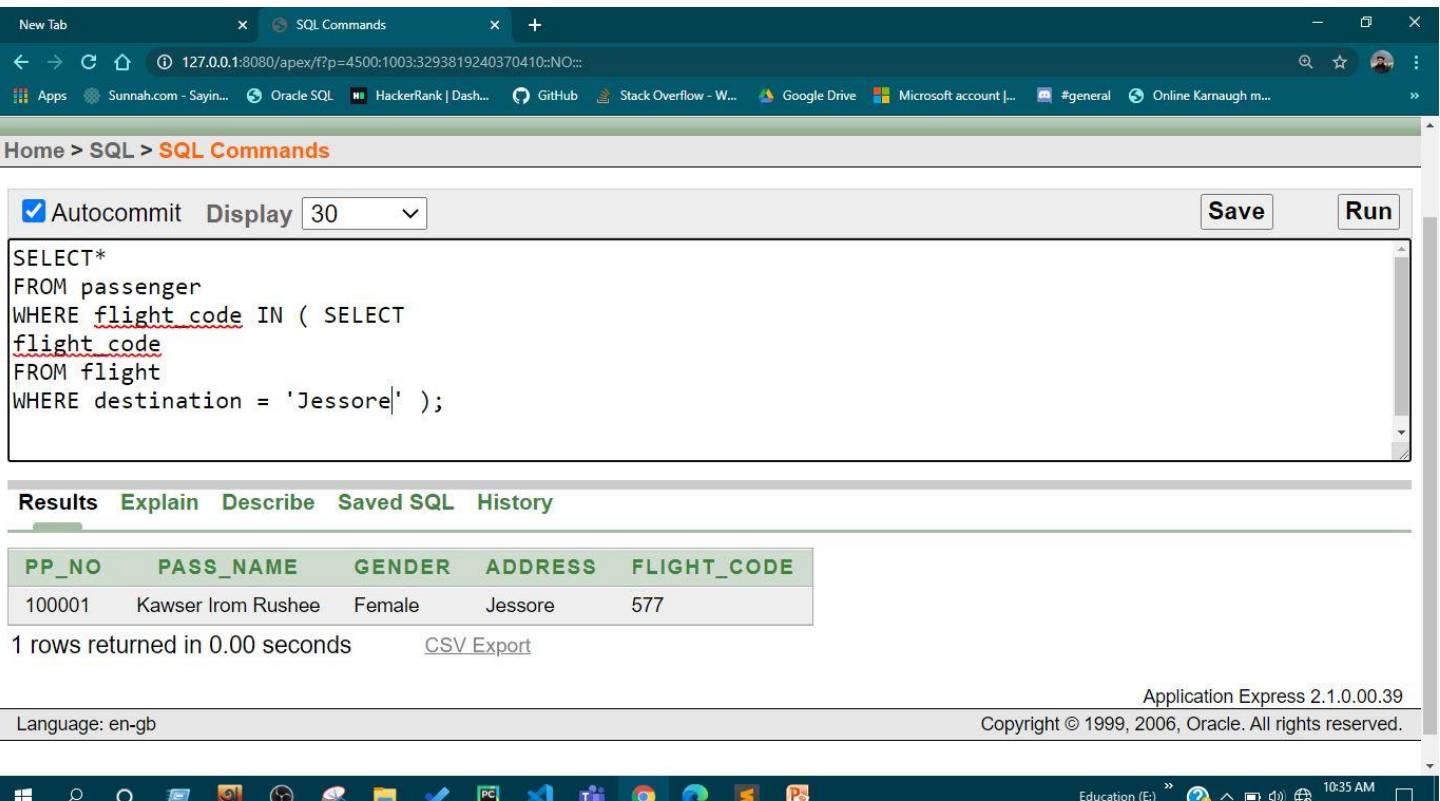


Subquery

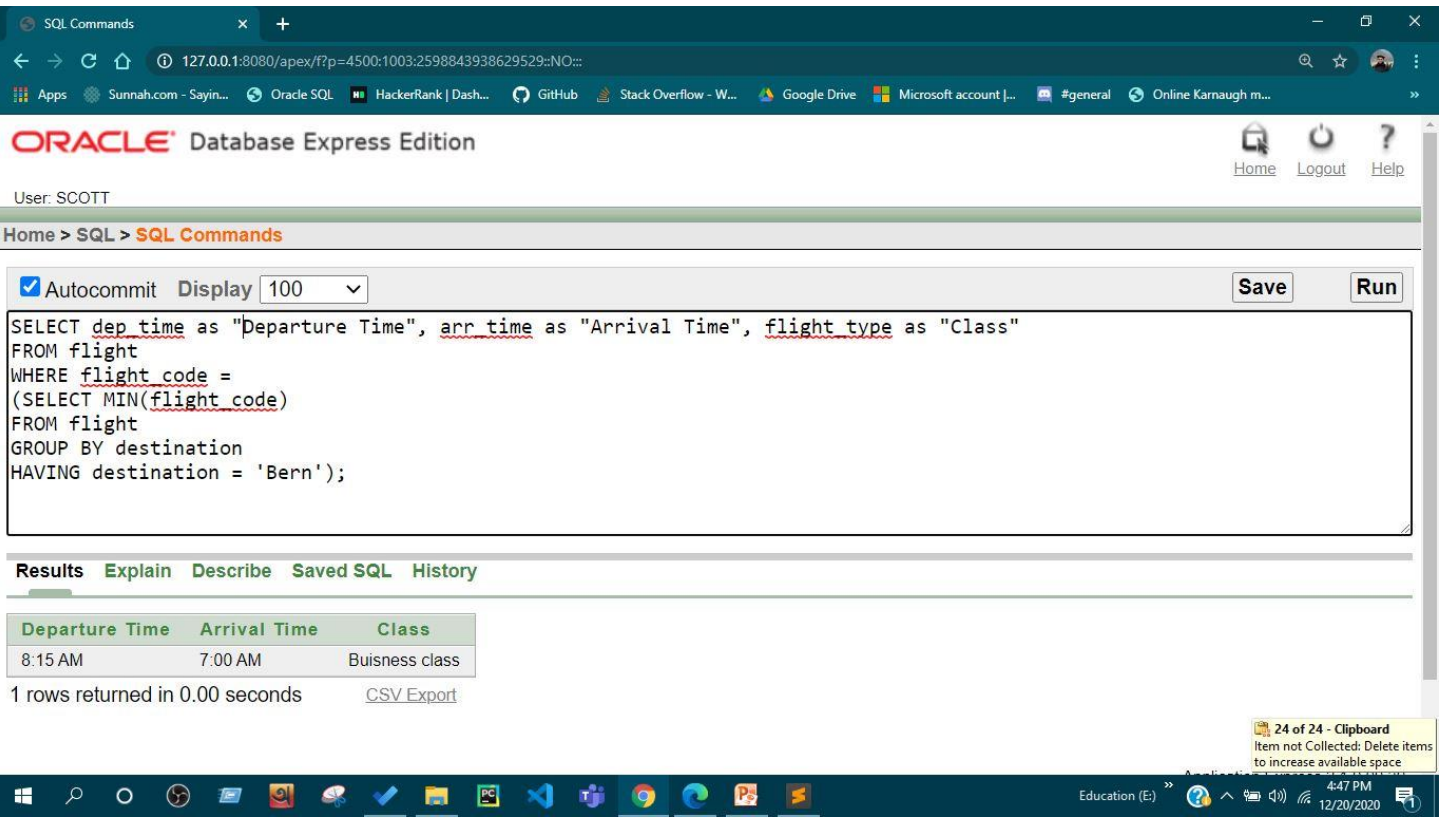
1. Subquery (without group function): Display the employees who work at Osmani Int. Airport.



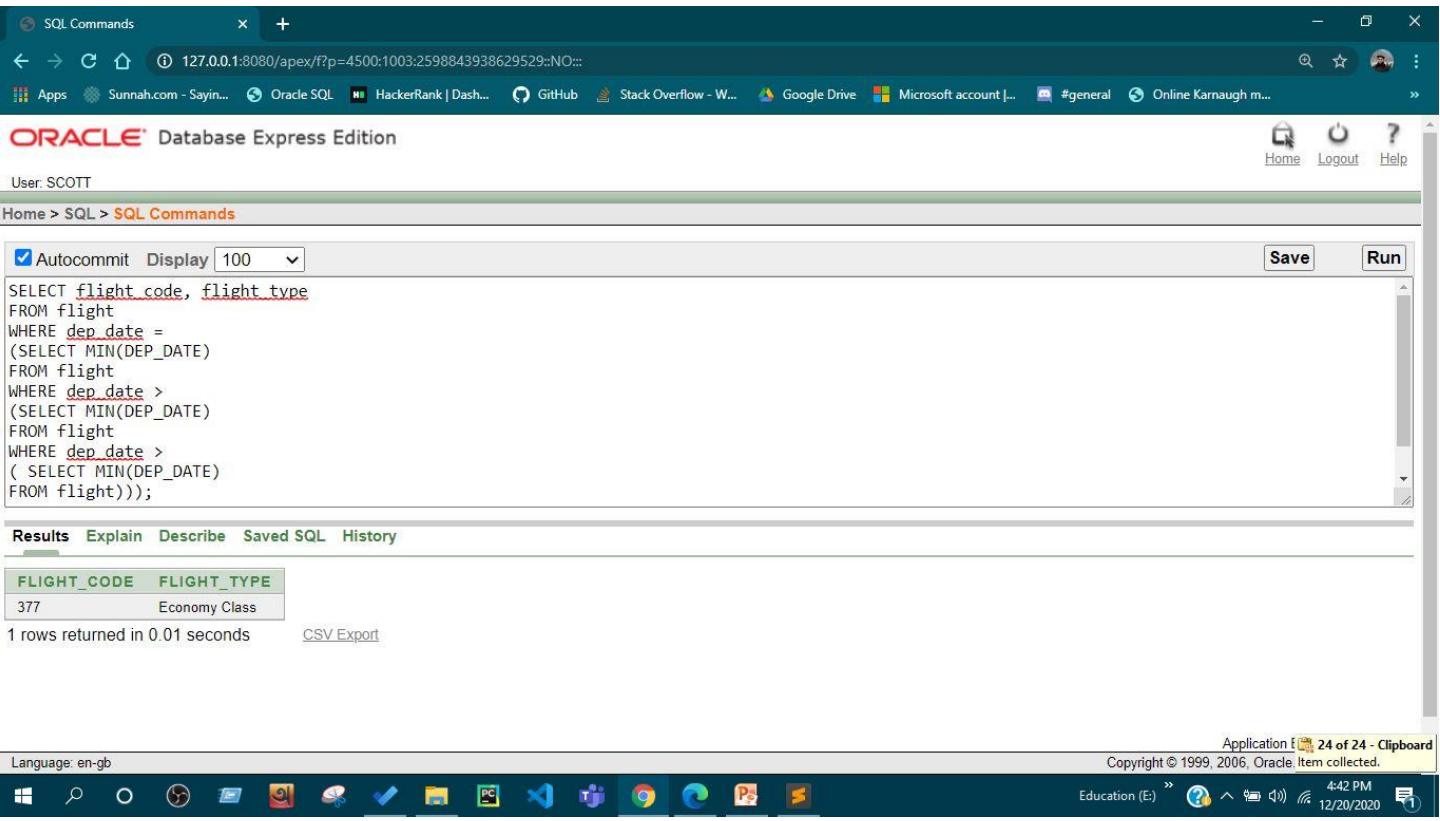
2. Subquery (without group function): Display the passengers details who are going to Jessore.



3. Subquery (with group function): Display the departure time, arrival time and flight type of the flights which have the lowest flight code out of all the flights going to Bern.

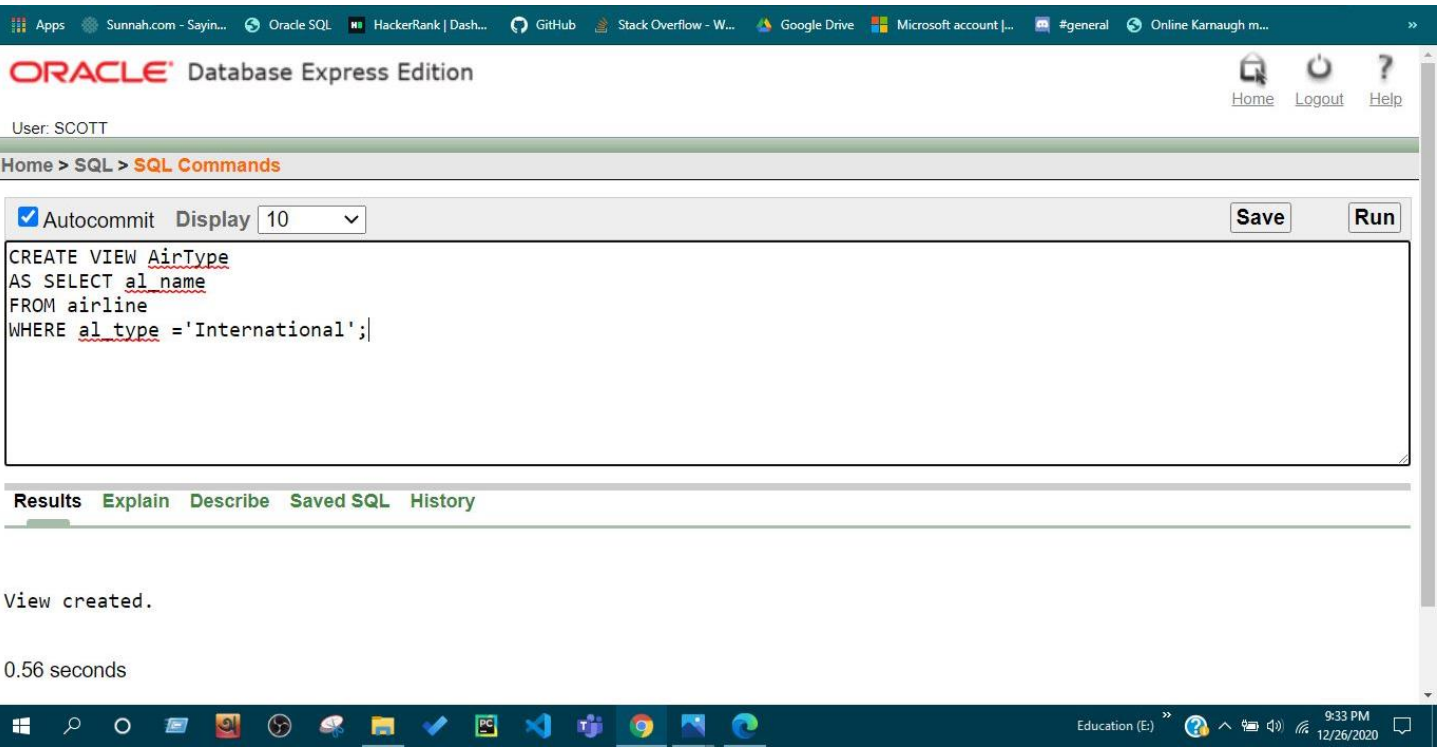


4. Subquery (with group function): Display the flight code and flight type of the passenger who is travelling the 3rd earliest.

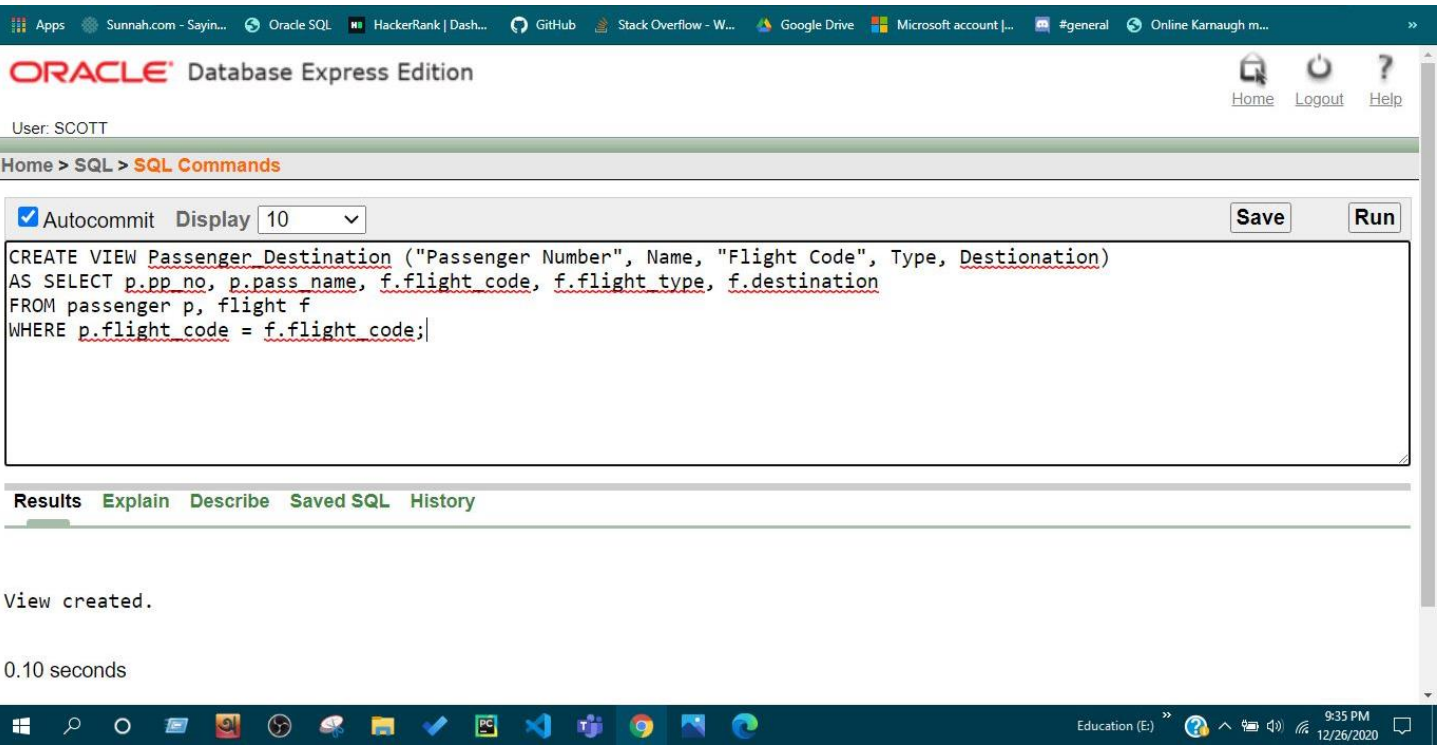


View

1. Simple View: Create a simple view to display the names of International airlines



2. Complex View: Create a view named Passenger_destination to show the pp_no as Passenger number ,pass_name as Name, flight_code as Flight code, flight type as Type and Destination .



Constraint

Add Constraint in any of your table: