



AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

FACULTY OF SCIENCE and TECHNOLOGY

INTRODUCTION TO DATABASE SPRING

DEPARTMENT OF CSE

2023-2024

Section: C

Project: Airlines Management System

Submitted By:

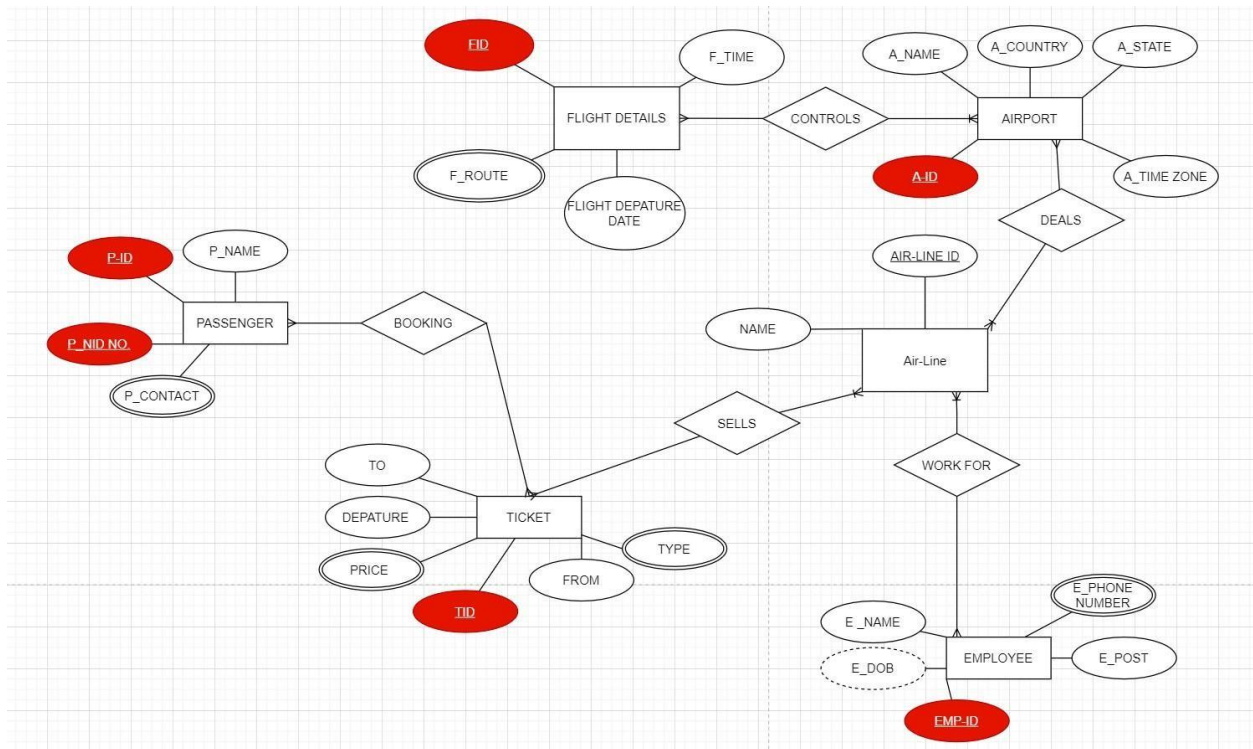
NAME	ID
1.SAJIN,HASIN MAHTAB	22-46342-1

Introduction:

Case study:

Introduction: The Hazrat Shahjalal International Airport in Dhaka, Bangladesh, is being expanded to address the continued increase in domestic and international **passengers** and cargo passing through the facility. This **Airport** has several branches in different countries. Most **Branches** are in Dhaka. Its dedicated **Employees** are keen to prove the quality of service often recommended by its passengers. The Hazrat Shahjalal International Air is well known for low airfare for both-way route services across domestic customers. This airport has a highly customized **Airplane**. This Air is having more transactions and **Ticket** selling, causing day-to-day expanding business activities hard to manage its operations. To ensure more flexible service for customers, it's highly recommended to implement an Airlines computerized system that will help the employees to manage all information related to flight, passengers, their contact details, IDs, schedule publishing, etc.

ER Diagram:



Normalization :

Relation:Many to Many

UNF: P-ID,P-Name, P-Nid.No, P-contact, T-ID,T-To, T-Depature

, T-From , T-Type, T-Price

1NF: Multivalued Attributes: P-contact,T-PriceT-Type
P-ID ,P-Name, P-Nid.No, T-ID,T-To, T-Depature , T-From ,

2NF :

1. P-ID, P-contact
2. T-id, T-Price, **T-Type**
3. P-ID, P-Name, P-Nid.No
4. T-ID, T-To,T- Depature , T-From , P-ID

3NF:

1. P-ID, P-Name, P-NID.No
2. T.ID, T-TO, T-From, T-Departure
3. P-ID, P-Contact
4. T-ID, T-Price,T-Type
5. T-ID,P-ID

RELATIONS:Many To Many

UNF: Air-line.ID, A-Name , T-ID,T-To, T-From, T-Type, TPrice,
T-Departure Date

1NF:Multivalued Attributes: T-Type, T-Price
Air-Line.ID, A-Name, T-ID,T-TO, T-From,T-Departure

2NF:

1. Air-Line.ID, Air-Line.Name
2. T.ID, T.Type, T.Price
3. T.ID, T.To, T.From, T-Departure,Air-Line.ID

3NF

1. Air-Line.ID, Air-Line.Name
2. T.ID , T.Type, T.Price
3. T.ID, T.To, T.From, T-Departure,Air-Line.ID

RELATIONS:Many To Many

UNF: Air-line_ID, A.Name, E.ID, E.Name, E.DOB, ,E.Post, E.PhoneNumber

1NF:Multivalued Attributes: **E.PhoneNumber**
Air-line_ID, A.Name, E.Name, **E.DOB**, E.ID, E.Post,

2NF:

1. E.ID, **E.PhoneNumber**
2. Air-line_ID, A.Name
3. E.ID,E.Name, E.DOB,E.Post,Air-line.ID

3NF:

1. Air-line ID, A- Name
2. E.ID, E.Name, E.Post
3. E.ID, **E.PhoneNumber**
4. E.ID,E.Name, E.DOB,E.Post,Air-line.ID

4)RELATIONS:One To Many

UNF: A-ID, A-Name, A-Country, A-State, A-Time-Zone, Airline-ID,
A-Name

1NF:Multivalued Atributes:None

A-ID, A-Name, A-Country, A-State, A-Time-Zone, Airline-ID, A-Name

2NF:1. A-ID, A-Name, A-Country, A-State, A-Time-Zone.

2.Airline-ID, A-Name, A-ID

3NF: 1.A-ID, A-Name, A-Country, A-State, A-Time-Zone

2. Airline-ID, A-Name, A-ID

RELATIONS:One To Many

UNF: F-ID, F-Time, F-Route, F-Departure-Date, A-ID ,A-Name,
ACountry, A-State, A-Time-Zone.

1NF:**Multivalued Attributes:** F-Route F-ID, FTime,

F-Departure-Date, A-ID, A-Name, ACountry, A-
State, A-Time-Zone.

2NF: 1. F-ID, F-Route

2. F-ID, F-Time, F-Departure-Date

3. A-ID, A-Name, A-Country, A-State, A-Time-Zone, A-ID,

3NF: 1.F-ID, F-Time, F-Departure-Date

2. F-ID, F-Route
3. A-ID, A-Name, A-Country, A-State, A-Time Zone, A-ID,

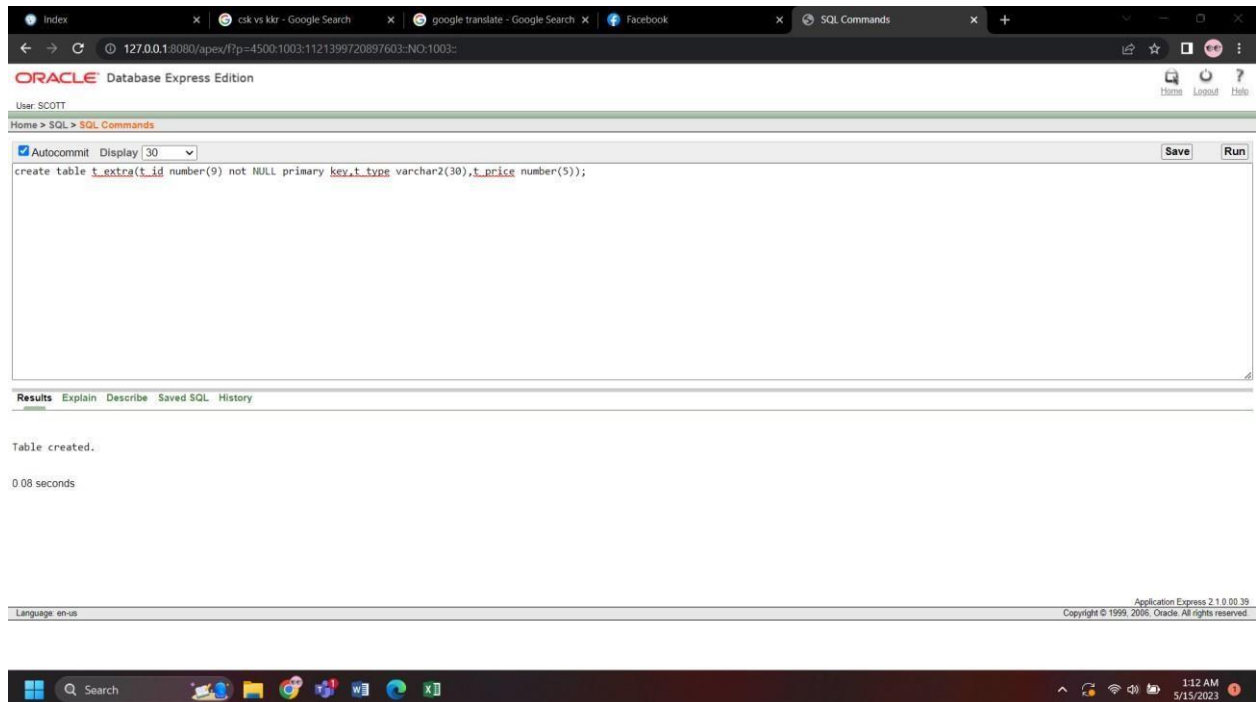
Final Table :

- 1) P-ID, P-Name, P-NID
- 2) T-ID, T-TO, T-From, T-Departure
- 3) P-ID, P-Contact
- 4) T-ID, T-Type , T-Price
- 5) T-ID, P-ID
- 6) A-ID, A-Name
- 7) Air-Line.ID, T.ID
- 8) E.ID, E.Name, E.Post
- 9) E.ID, E.DOB, E.PhoneNumber
- 10) A.ID, E.ID
- 11) A-ID, A-Name, A-Country, A-State, A-Time-Zone
- 12) A-ID, Airline-ID
- 13) F-ID, F-Route
- 14) F-ID, F-Time, F-Departure-Date
- 15) F-ID, A-ID

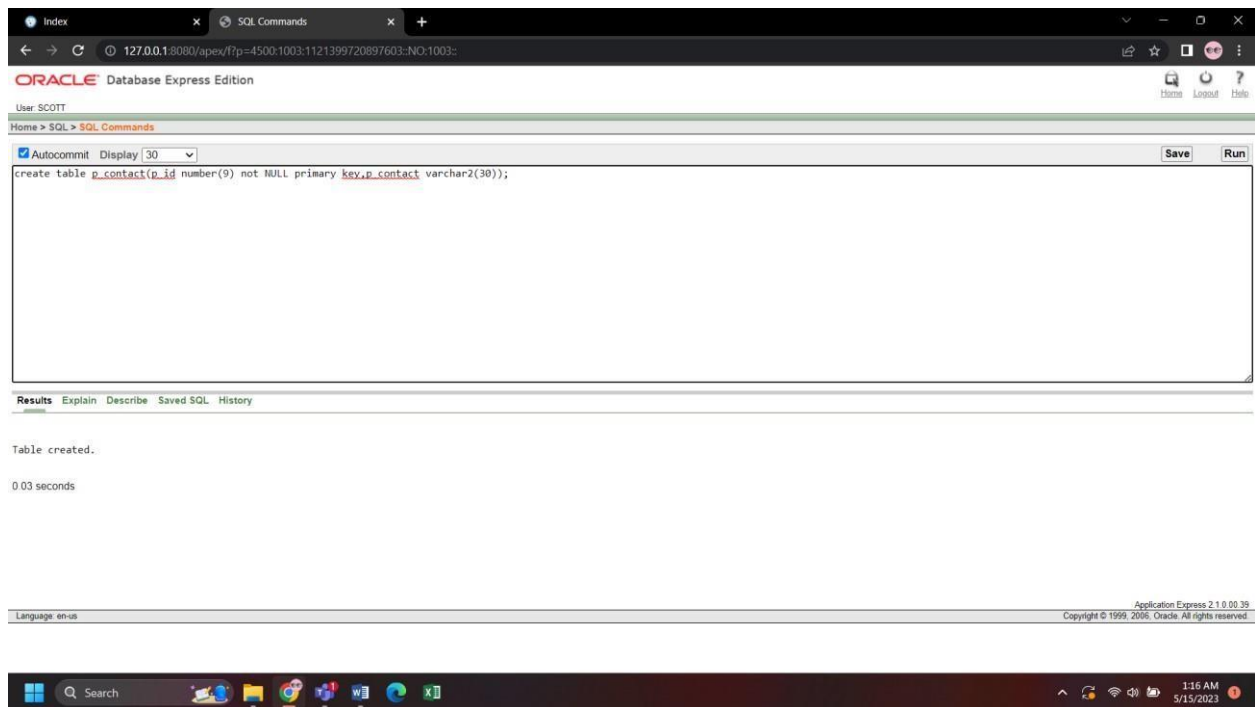
Table Creation :

Screen Shot of Table creation

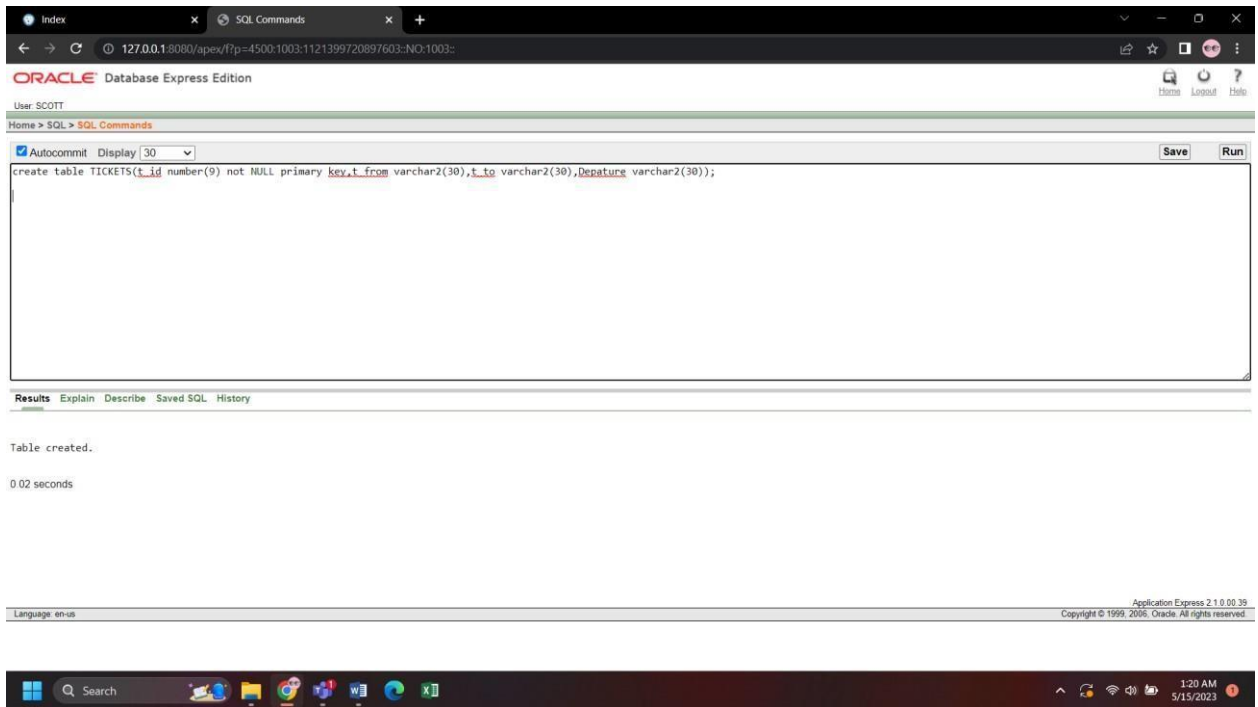
1.create table t_extra(t_id number(9) not NULL primary key,t_type varchar2(30),t_price number(5));



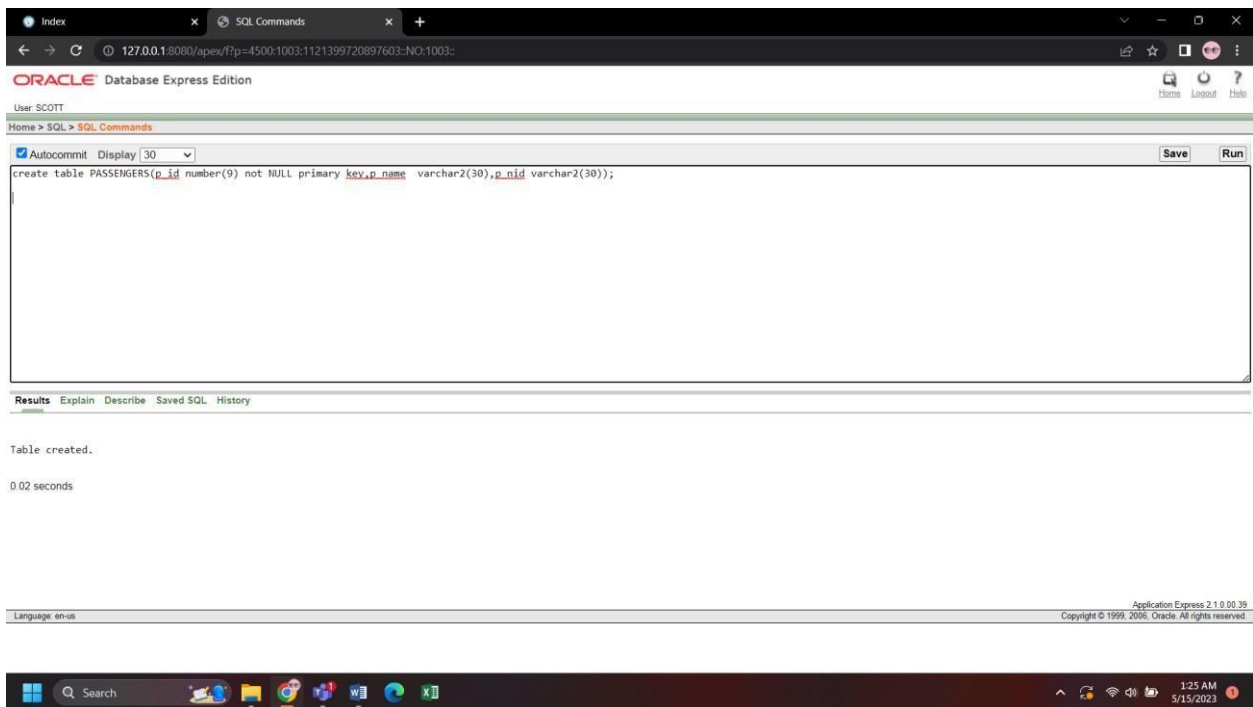
2.create table p_contact(p_id number(9) not NULL primary key,p_contact varchar2(30));



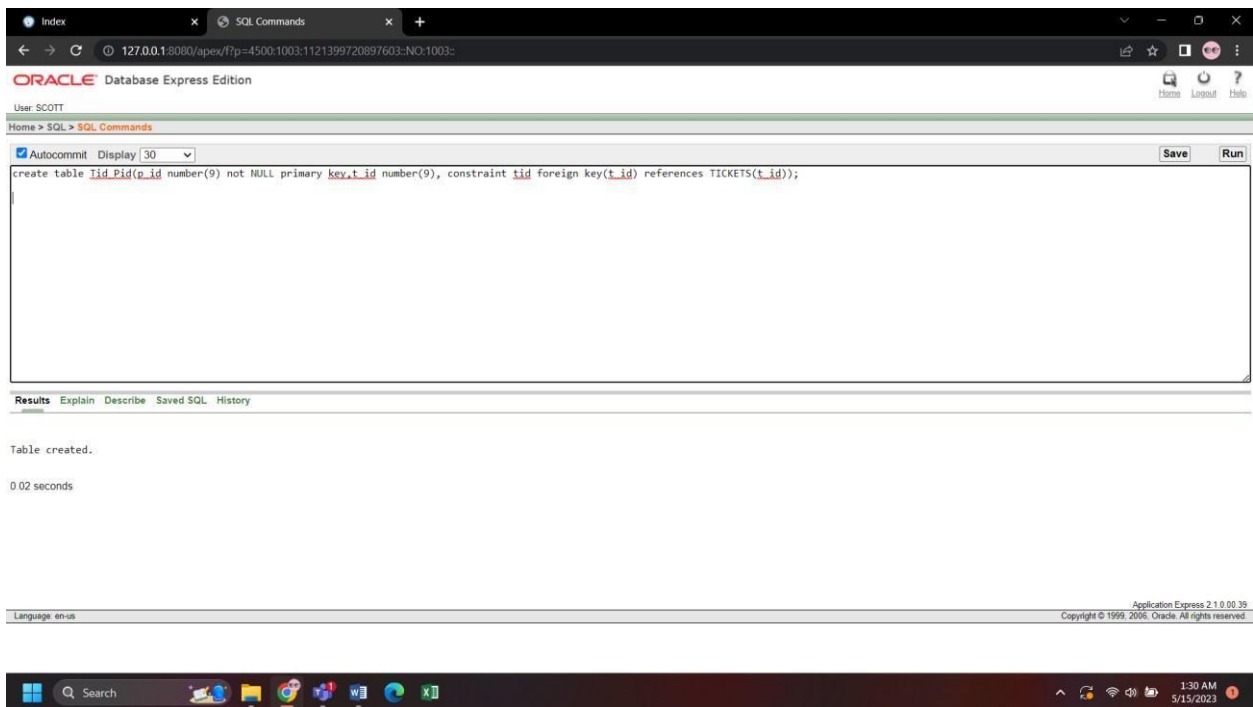
**3.create table TICKETS(t_id number(9) not NULL primary
key,t_from varchar2(30),t_to varchar2(30),Depature varchar2(30));**



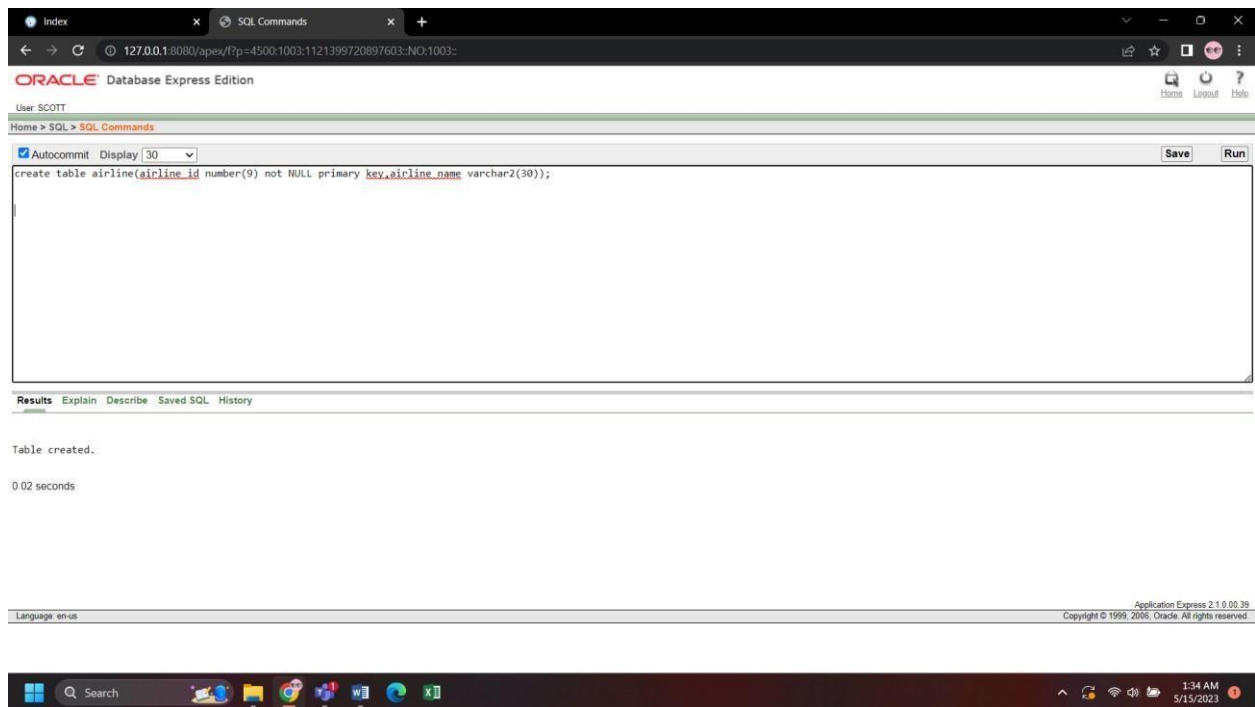
**4.create table PASSENGERS(p_id number(9) not NULL primary
key,p_name varchar2(30),p_nid varchar2(30));**



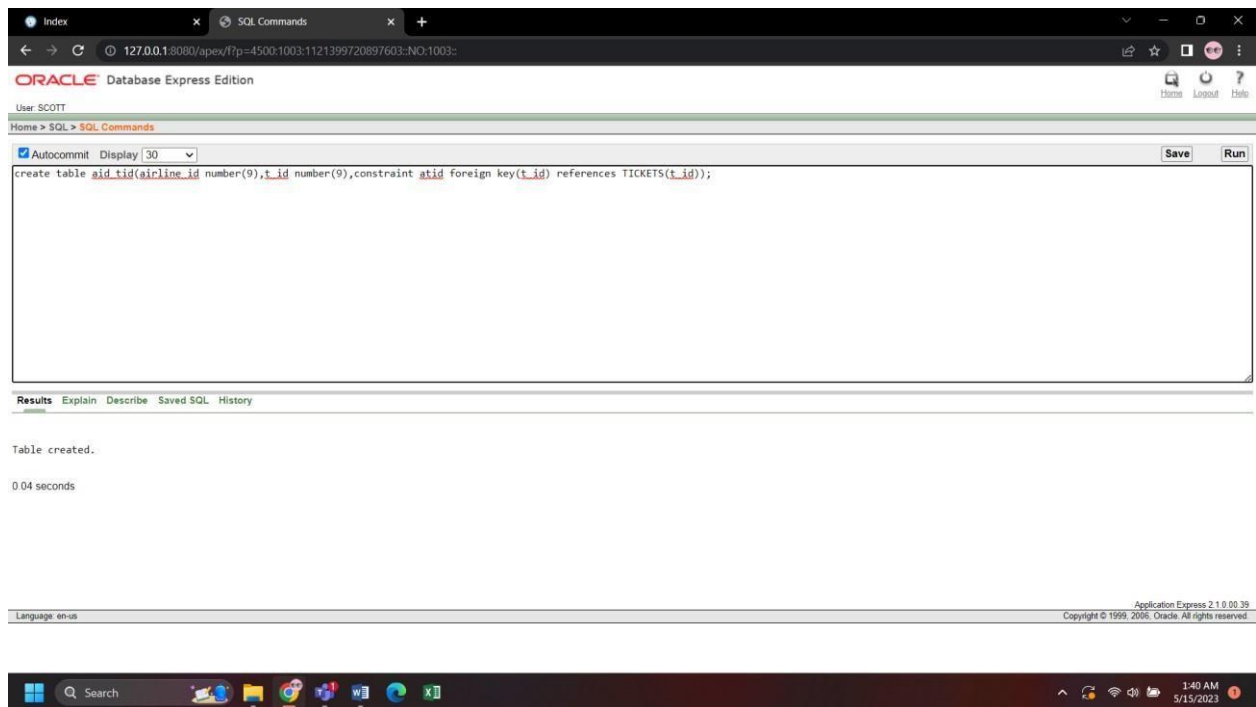
5.create table Tid_Pid(p_id number(9) not NULL primary key,t_id number(9), constraint tid foreign key(t_id) references TICKETS(t_id));



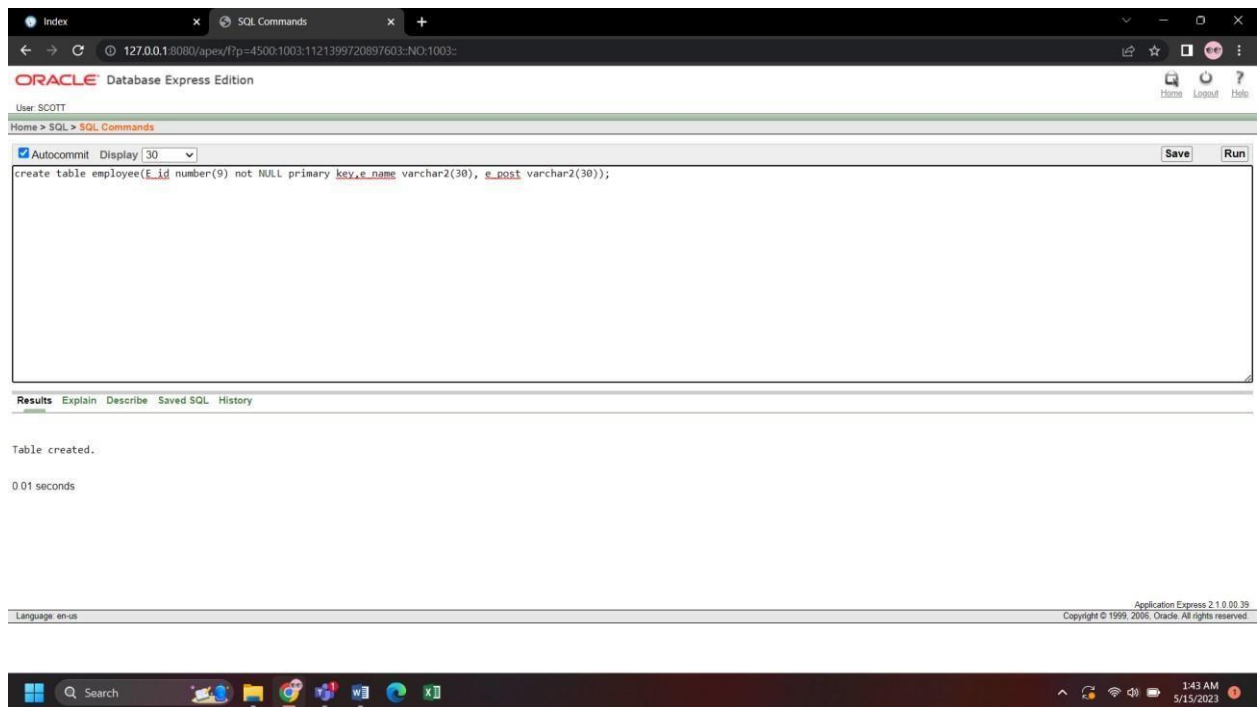
**6.create table airline(airline_id number(9) not NULL primary
key,airline_name varchar2(30));**



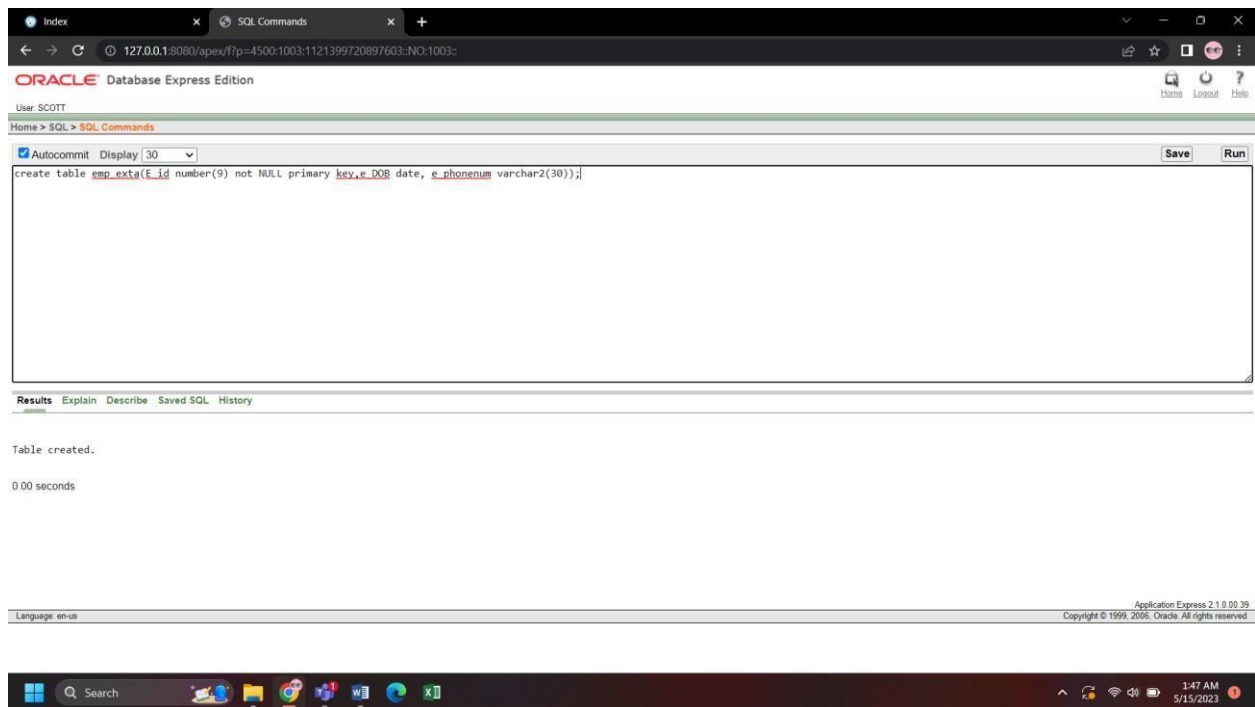
**7.create table aid_tid(airline_id number(9),t_id number(9),constraint
atid foreign key(t_id) references
TICKETS(t_id));**



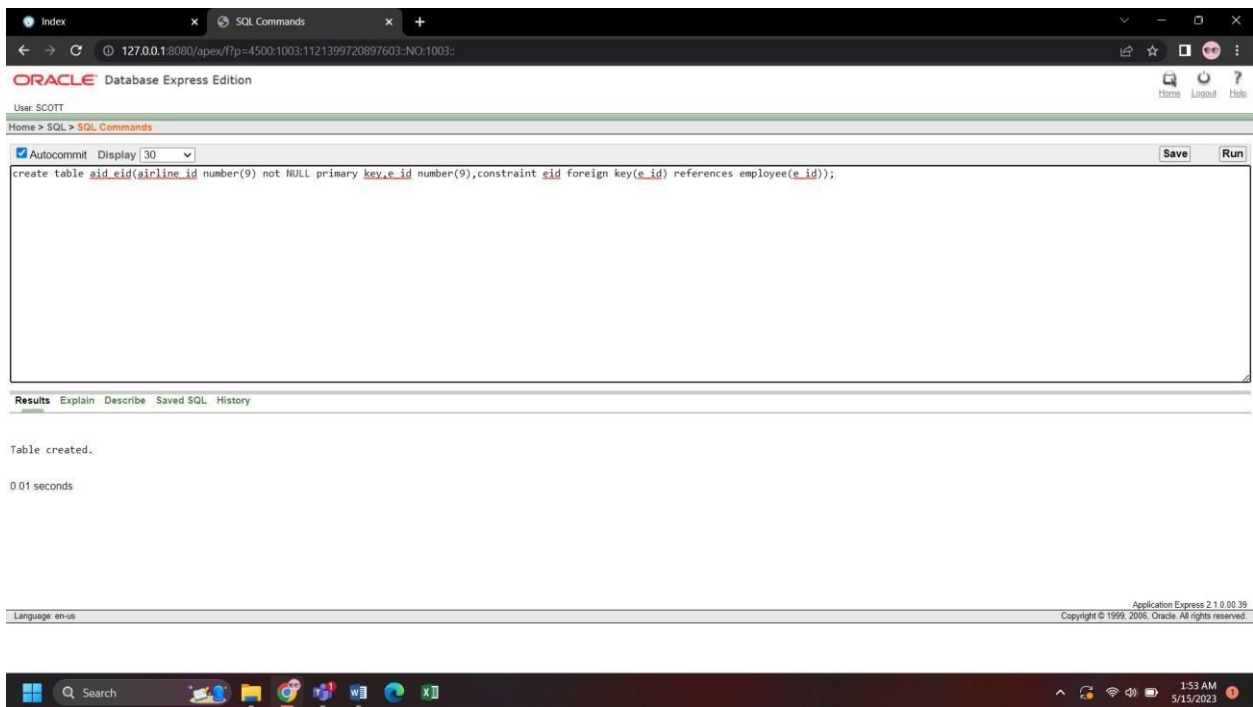
**8.create table employee(E_id number(9) not NULL primary
key,e_name varchar2(30), e_post varchar2(30));**



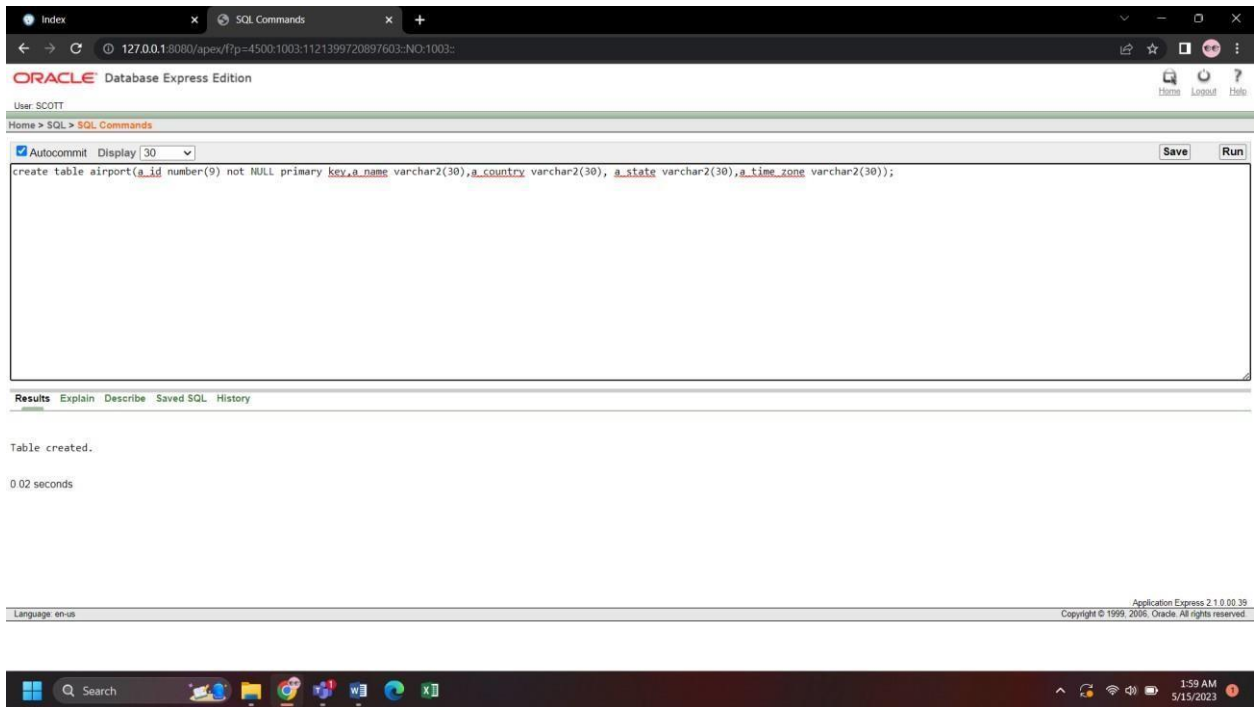
**9.create table emp_exta(E_id number(9) not NULL primary
key,e_DOB date, e_phonenum varchar2(30));**



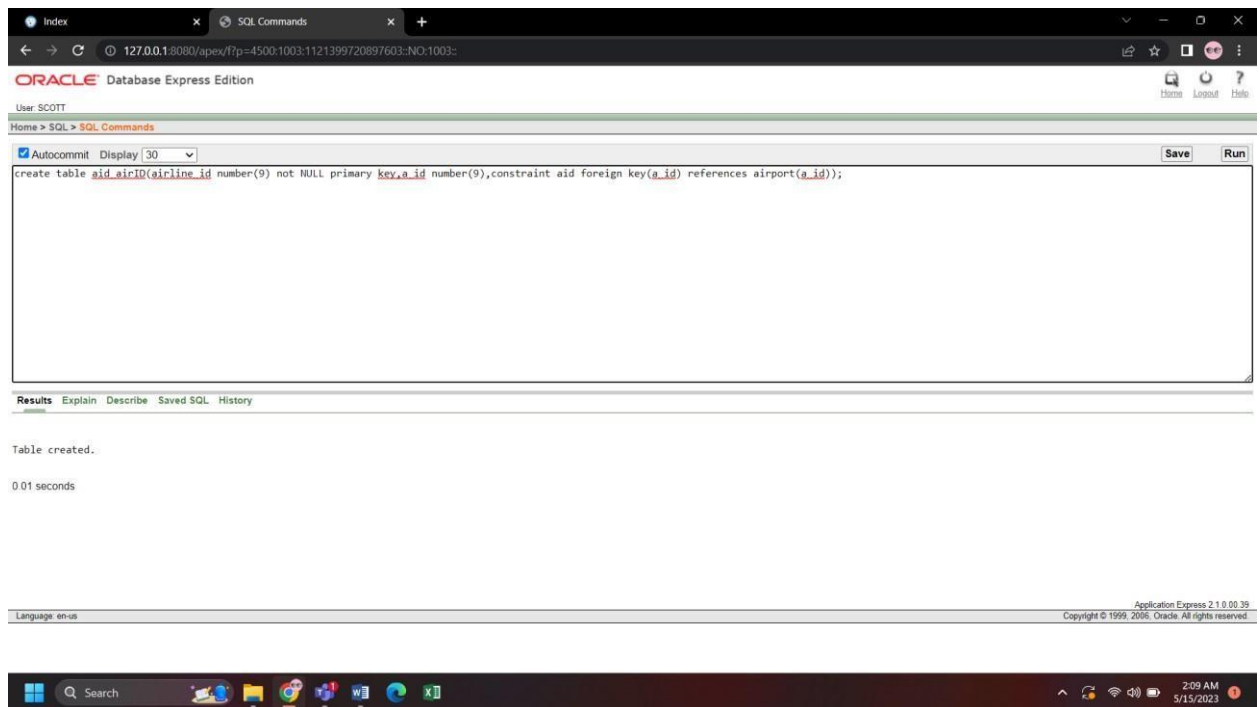
**10.create table aid_eid(airline_id number(9) not NULL primary
key,e_id number(9),constraint eid foreign key(e_id) references
employee(e_id));**



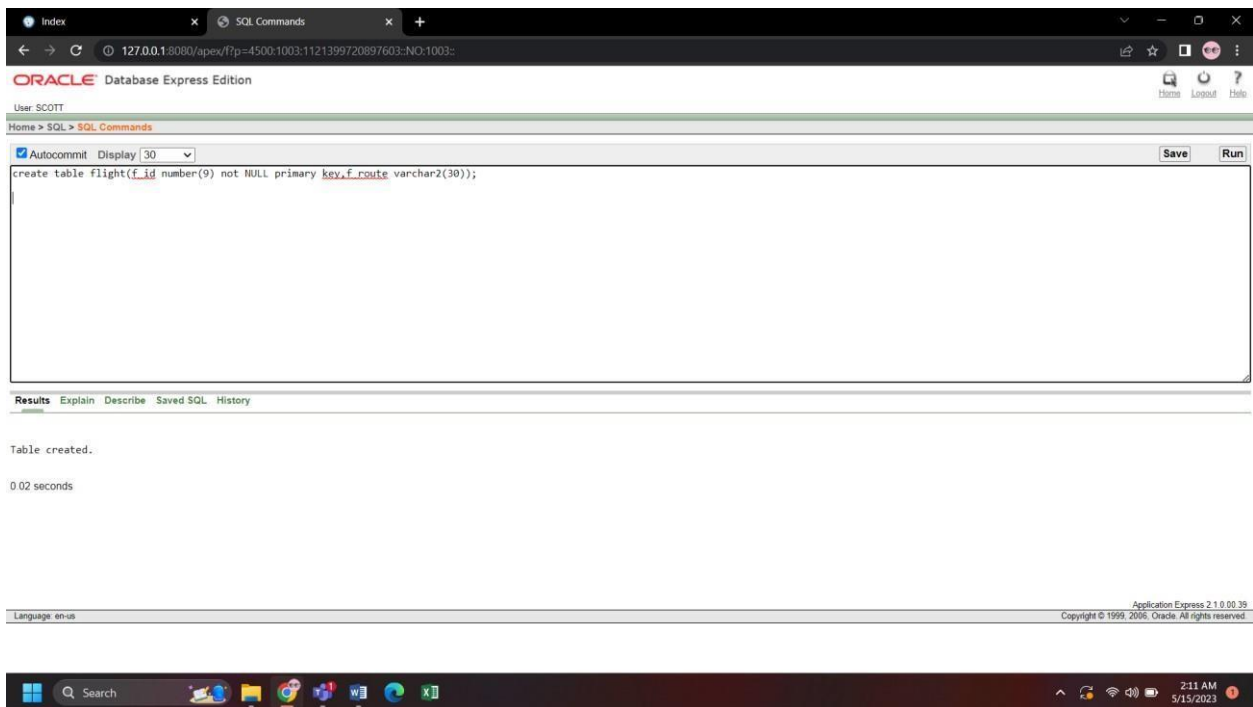
11.create table airport(a_id number(9) not NULL primary key,a_name varchar2(30),a_country varchar2(30), a_state varchar2(30),a_time_zone varchar2(30));



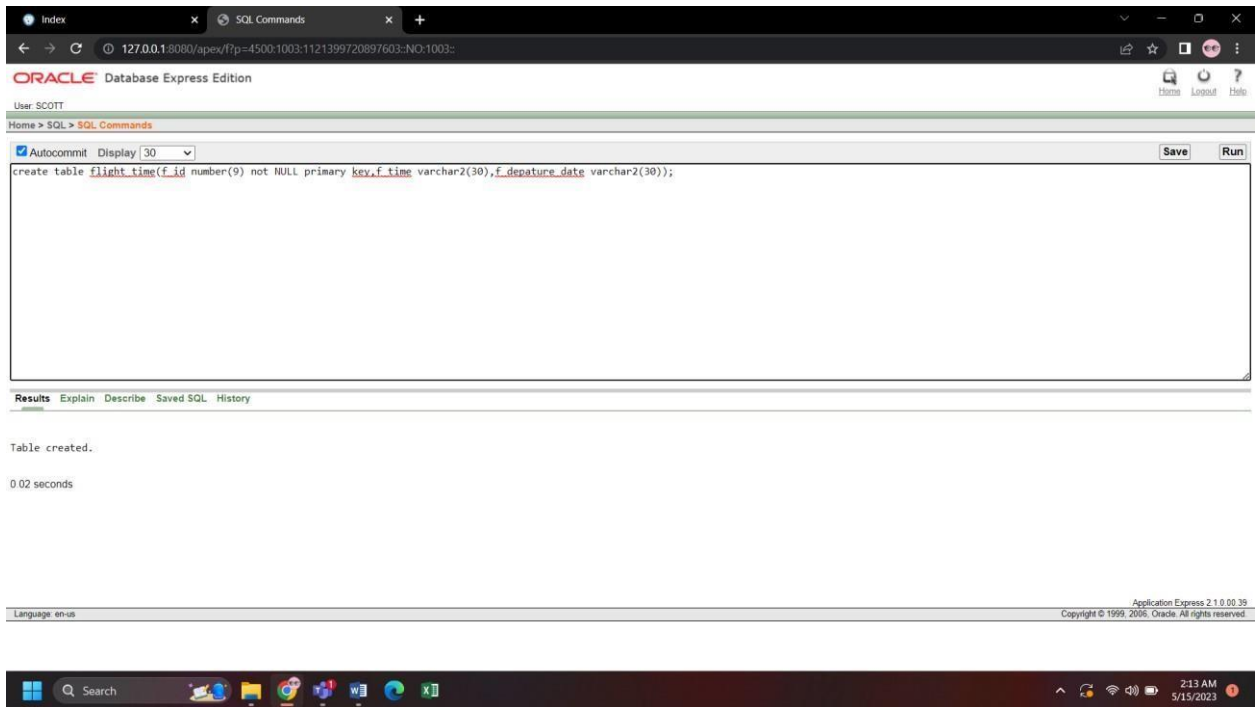
**12.create table aid_airID(airline_id number(9) not NULL primary
key,a_id number(9),constraint aid foreign key(a_id) references
airport(a_id));**



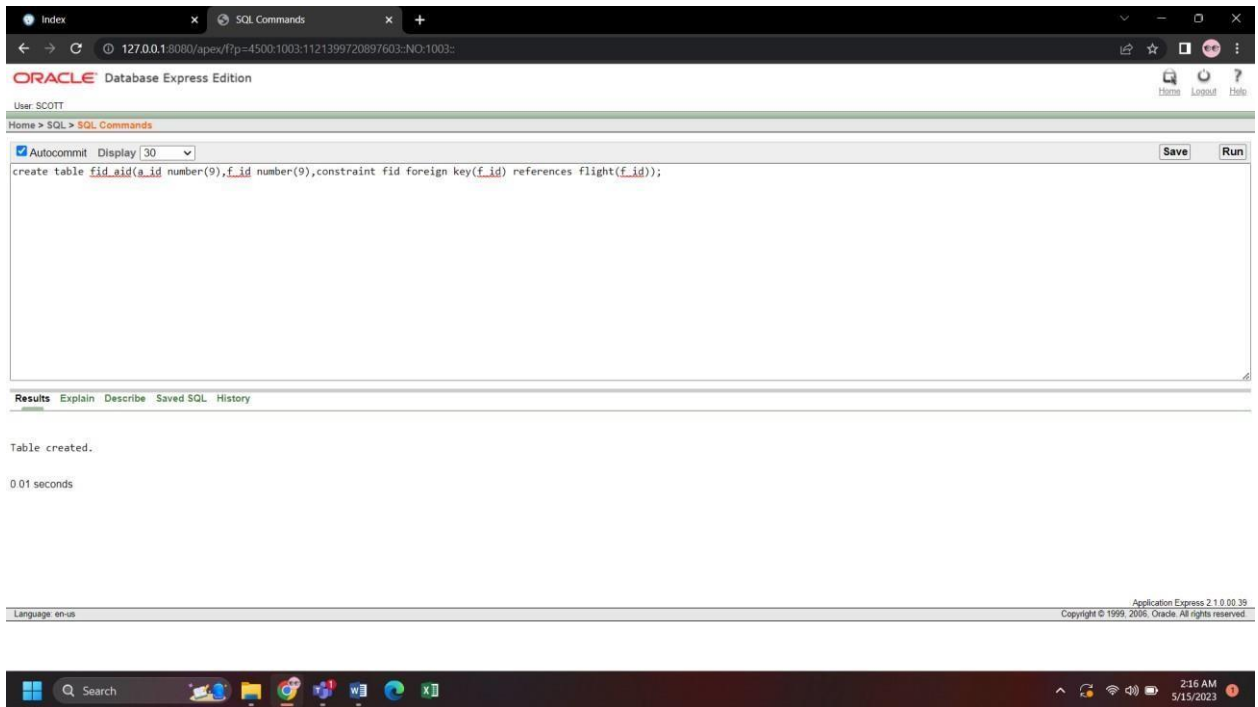
**13.create table flight(f_id number(9) not NULL primary key,f_route
varchar2(30));**



**14.create table flight_time(f_id number(9) not NULL primary
key,f_time varchar2(30),f_depature_date varchar2(30));**



15. create table fid_aid(a_id number(9),f_id number(9),constraint fid foreign key(f_id) references flight(f_id));



INSERT TABLE DATA:

Oracle Database Express Edition interface showing SQL Commands and Results.

User: SCOTT

Home > SQL > SQL Commands

Autocommit: ☒ Display: 30

SQL Command:

```
select*  
from fid_aid
```

Results:

A_ID	F_ID
9999	1122
7777	2233
5555	3344
3333	4455

4 rows returned in 0.00 seconds

Language: en-us

Application Express 2.1.0.00.39
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**insert into fid_aid values(9999,1122); insert into fid_aid
values(7777,2233); insert into fid_aid values(5555,3344); insert into
fid_aid values(3333,4455);**

Oracle Database Express Edition interface showing SQL Commands and Results.

User: SCOTT

Home > SQL > SQL Commands

Autocommit: ☒ Display: 30

SQL Command:

```
select*  
from flight_time
```

Results:

F_ID	F_TIME	F_DEPARTURE_DATE
1122	6:00 PM	10-12-22
2233	6:00 PM	12-12-22
3344	6:00 PM	14-12-22
4455	6:00 PM	16-12-22

4 rows returned in 0.00 seconds

Language: en-us

Application Express 2.1.0.00.39
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insert into flight_time values(1122,'6:00 PM','10-12-22'); insert into flight_time values(2233,'6:00 PM','12-12-22'); insert into flight_time values(3344,'6:00 PM','14-12-22'); insert into flight_time values(4455,'6:00 PM','16-12-22');

Oracle Database Express Edition interface showing a SQL query execution result.

SQL Commands

Autocommit: ☒ Display: 30

SQL Query:

```
select*  
from flight
```

Results

F_ID	F_ROUTE
1122	DHAKA-USA
2233	DHAKA-USA
3344	DHAKA-USA
4455	DHAKA-USA

4 rows returned in 0.01 seconds

Language: en-us

Application Express 2.1.0.00.39
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**insert into flight values(1122,'DHAKA-USA'); insert into flight
values(2233,'DHAKA-USA'); insert into flight values(3344,'DHAKA-
USA'); insert into flight values(4455,'DHAKA-USA');**

Oracle Database Express Edition interface showing a SQL query and its results.

User: SCOTT

Home > SQL > SQL Commands

Autocommit: ☒ Display: 30

Save Run

```
select*
from AID_AIRID
```

Results Explain Describe Saved SQL History

AIRLINE_ID	A_ID
12345	9999
22344	7777
55000	5555
66000	3333

4 rows returned in 0.00 seconds CSV Export

Language: en-us Application Express 2.1.0.00.39 Copyright © 1999, 2008, Oracle. All rights reserved.



**insert into AID_AIRID values(12345,9999); insert into AID_AIRID
values(22344,7777); insert into AID_AIRID values(55000,5555);
insert into AID_AIRID values(66000,3333);**

The screenshot shows the Oracle Database Express Edition interface. The 'SQL Commands' window is active, displaying the following SQL query:

```
select*  
from airport |
```

Below the query window, the 'Results' tab is selected, showing a table with 4 rows and 5 columns:

A_ID	A_NAME	A_COUNTRY	A_STATE	A_TIME_ZONE
9999	DHAKA_AIRPORT	BANGLADESH	DHAKA	+6:00 PM
7777	BARISHAL_AIRPORT	BANGLADESH	BARISHAL	+6:00 PM
5555	COXS_BAZAR_AIRPORT	BANGLADESH	COXS_BAZAR	+6:00 PM
3333	JOSHORE_AIRPORT	BANGLADESH	JOSHORE	+6:00 PM

At the bottom of the results section, it states: '4 rows returned in 0.00 seconds' and provides a 'CSV Export' link. The Windows taskbar at the bottom shows the time as 4:31 PM on 5/15/2023.

insert into airport

values(9999,'DHAKA_AIRPORT','BANGLADESH','DHAKA','+6:00 PM');

insert into airport

values(7777,'BARISHAL_AIRPORT','BANGLADESH','BARISHAL','+6:00 PM');

insert into airport

values(5555,'COXS_BAZAR_AIRPORT','BANGLADESH','COXS_BAZAR','+6:00 PM');

insert into airport

values(3333,'JOSHORE_AIRPORT','BANGLADESH','JOSHORE','+6:00 PM');

Oracle Database Express Edition interface showing a SQL query execution. The query is:

```
select*  
from aid_eid
```

The results table shows 4 rows:

AIRLINE_ID	E_ID
12345	111
22344	222
55000	333
66000	444

4 rows returned in 0.00 seconds

**insert into aid_eid values(12345,111) insert into aid_eid
values(22344,222) insert into aid_eid values(55000,333) insert into
aid_eid values(66000,444)**

Oracle Database Express Edition interface showing a SQL query execution. The query is:

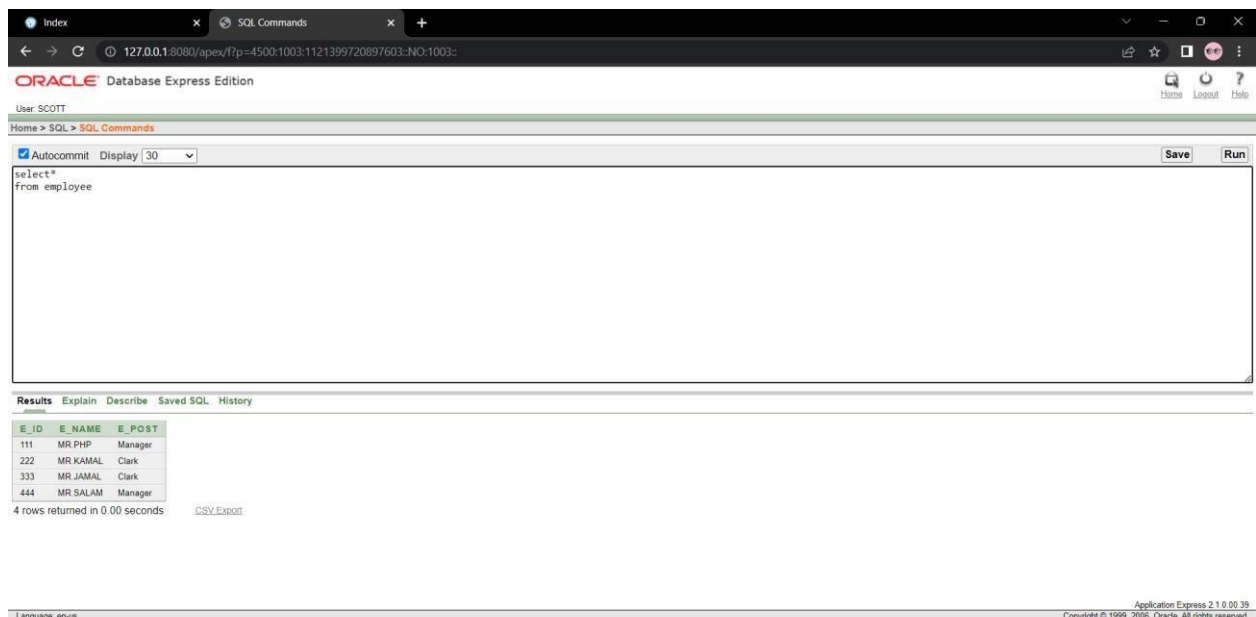
```
select*  
from emp_exta
```

The results table shows 4 rows:

E_ID	E_DOB	E_PHONENUM
111	10-DEC-00	01771957500
222	12-OCT-00	01991000000
333	14-OCT-00	01441000000
444	20-DEC-00	01331000000

4 rows returned in 0.02 seconds

**insert into emp_exta values(111,'10-DECEMBER-
 2000','01771957500') insert into emp_exta values(222,'12-
 OCTOBER-
 2000','01991000000') insert into emp_exta values(333,'14-
 OCTOBER-
 2000','01441000000') insert into emp_exta values(444,'20-
 DECEMBER-
 2000','01331000000')**



The screenshot shows the Oracle Database Express Edition web interface. The user is logged in as SCOTT. The SQL Commands tab is active, and the query editor contains the following SQL statement:

```
select*
from employee
```

The query has been executed, and the results are displayed in a table with 4 rows. The table has columns E_ID, E_NAME, and E_POST. The results are as follows:

E_ID	E_NAME	E_POST
111	MR PHP	Manager
222	MR KAMAL	Clark
333	MR JAMAL	Clark
444	MR SALAM	Manager

4 rows returned in 0.00 seconds. A CSV Export link is available below the table.

**insert into employee VALUES(111,'MR.PHP','Manager') insert into
 employee VALUES(222,'MR.KAMAL','Clark') insert into employee
 VALUES(333,'MR.JAMAL','Clark') insert into employee
 VALUES(444,'MR.SALAM','Manager')**

Oracle Database Express Edition interface showing the results of a SQL query. The query is:

```
select*  
from AID_TID
```

The results table shows 4 rows:

AIRLINE_ID	T_ID
12345	7171
22344	8282
55000	9292
66000	1010

4 rows returned in 0.00 seconds

**insert into AID_TID values(12345,7171); insert into AID_TID
values(22344,8282); insert into AID_TID values(55000,9292); insert
into AID_TID values(66000,1010);**

Oracle Database Express Edition interface showing the results of a SQL query. The query is:

```
select*  
from airline
```

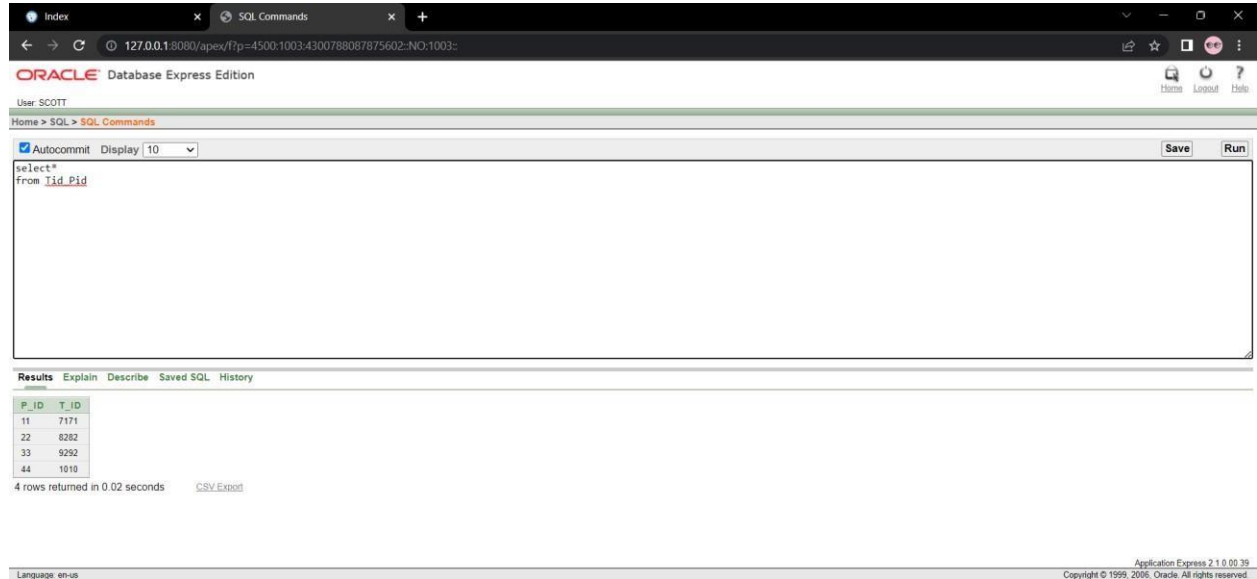
The results table shows 4 rows:

AIRLINE_ID	AIRLINE_NAME
12345	BD_AIRLINE_007
22344	DHAKA_AIRLINE
55000	JOY_BANGLA_AIRLINE
66000	AIRLINE_3000

4 rows returned in 0.00 seconds

insert into airline values(12345,'BD_AIRLINE_007'); insert into

**airline values(22344,'DHAKA_AIRLINE'); insert into airline
values(55000,'JOY_BANGLA_AIRLINE'); insert into airline
values(66000,'AIRLINE_3000');**



The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the following query:

```
select*  
from Tid_Pid
```

The Results window displays the following data:

P_ID	T_ID
11	7171
22	8282
33	9292
44	1010

4 rows returned in 0.02 seconds

**insert into Tid_Pid values(011,7171); insert into Tid_Pid
values(022,8282); insert into Tid_Pid values(033,9292); insert into
Tid_Pid values(044,1010);**

Oracle Database Express Edition interface showing SQL Commands and Results.

User: SCOTT

Home > SQL > SQL Commands

Autocommit: ☒ Display: 30

SQL Command:

```
select*  
from t_extra
```

Results:

T_ID	T_TYPE	T_PRICE
7171	ECONOMY	2100
8282	PRIME ECONOMY	2500
9292	BUSINESS	3100
1010	ECONOMY	2100

4 rows returned in 0.00 seconds

Language: en-us

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**insert into t_extra values(7171,'ECONOMY',2100); insert into t_extra
values(8282,'PRIME ECONOMY',2500); insert into t_extra
values(9292,'BUSINESS',3100); insert into t_extra
values(1010,'ECONOMY',2100);**

Oracle Database Express Edition interface showing the SQL Commands window. The command entered is:

```
select*  
from Passengers
```

The results table shows 3 rows returned in 0.02 seconds:

P_ID	P_NAME	P_NID
11	SAJIN	22-46342-1
22	MOONFE	20-43989-2
33	SADIA	22-46462-1

Language: en-us

insert into Passengers values(011,'SAJIN','22-46432-1'); insert into Passengers values(022,'MOONFE','20-43989-2'); insert into Passengers values(033,'SADIA','22-46462-1');

Oracle Database Express Edition interface showing the SQL Commands window. The user is SCOTT. The SQL command entered is:

```
select*  
from TICKETS
```

The results are displayed in a table:

T_ID	T_FROM	T_TO	DEPARTURE
7171	DHAKA	USE	6:00 PM
8282	DHAKA	USE	6:00 PM
9292	DHAKA	USE	6:00 PM
1010	DHAKA	USE	6:00 PM
2020	DHAKA	UAE	8:00 PM

5 rows returned in 0.00 seconds. CSV Export

insert into TICKETS values(7171,'DHAKA','USE','6:00 PM'); insert
into TICKETS values(8282,'DHAKA','USE','6:00 PM'); insert into
TICKETS values(9292,'DHAKA','USE','6:00 PM'); insert into
TICKETS values(1010,'DHAKA','USE','6:00 PM'); insert into
TICKETS values(2020,'DHAKA','UAE','8:00 PM');

Oracle Database Express Edition interface showing the SQL Commands window. The user is SCOTT. The SQL command entered is:

```
SELECT*  
FROM p_contact
```

The Results window displays the following data:

P_ID	P_CONTACT
11	01771000000
22	01991000000
33	01881000000
44	01331000000

4 rows returned in 0.00 seconds. CSV Export

Language: en-us Application Express 2.1.0.00.39 Copyright © 1999, 2006, Oracle. All rights reserved.

insert into p_contact values(011,'01771000000'); insert into p_contact values(022,'01991000000'); insert into p_contact values(033,'01881000000'); insert into p_contact values(044,'01331000000');

Constraint :

create table aid_airID(airline_id number(9) not NULL primary key,a_id number(9),constraint aid foreign key(a_id) references airport(a_id));

The screenshot shows the Oracle Database Express Edition interface. The SQL Commands window contains the following text:

```
create table aid_airID(airline_id number(9) not NULL primary key,a_id number(9),constraint aid foreign key(a_id) references airport(a_id));
select*
from aid_airID
```

The Results tab shows the following data:

AIRLINE_ID	A_ID
12345	9999
22344	7777
55000	5555
66000	3333

4 rows returned in 0.00 seconds

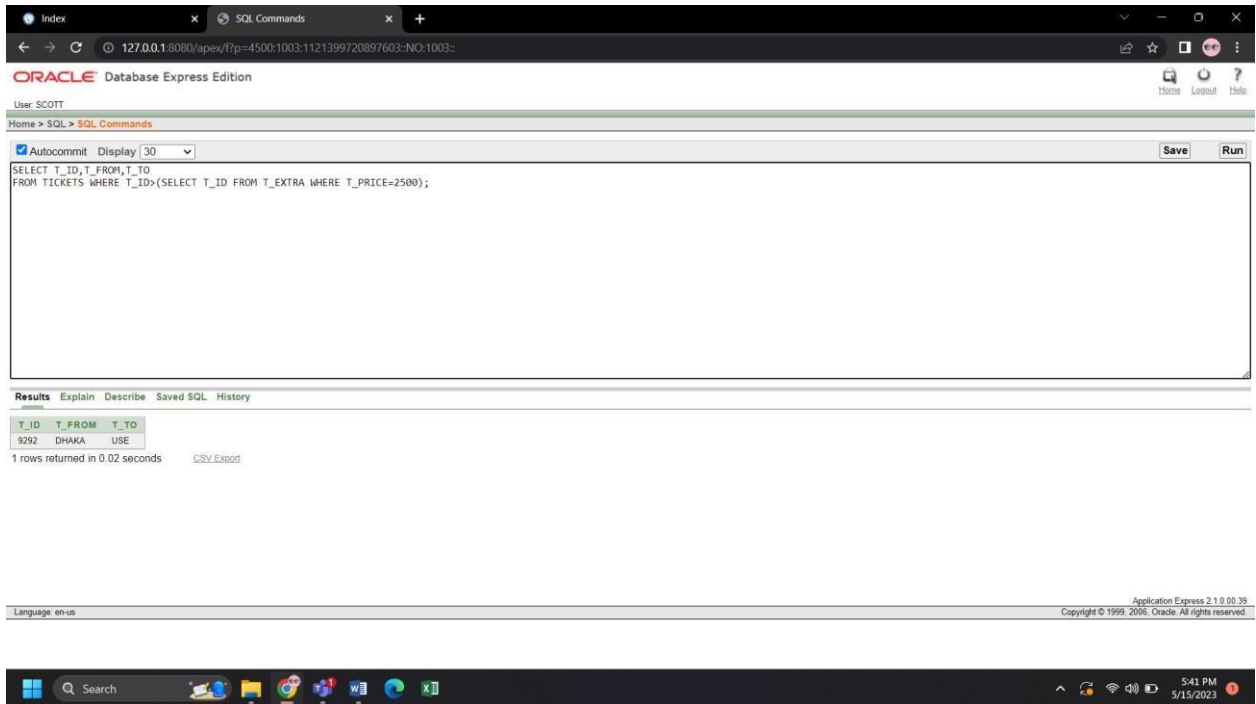
Application Express 2.1.0.00.39
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Query :

- Sub Query :

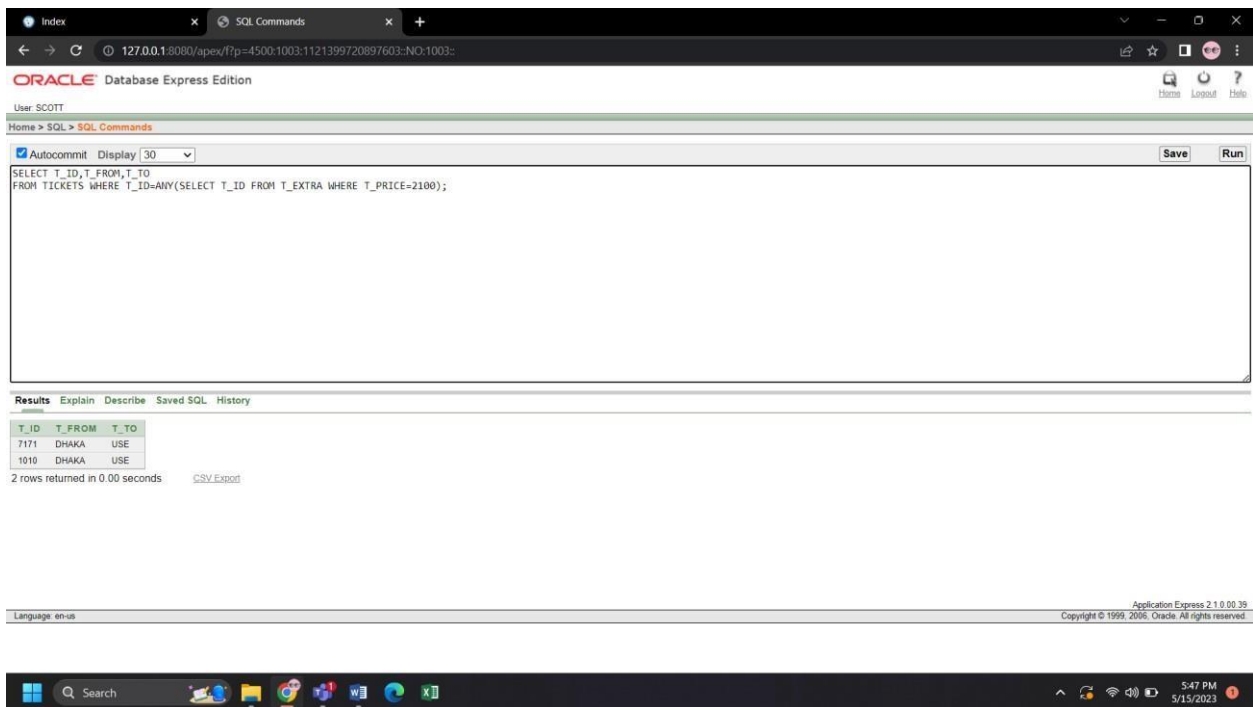
SINGLE-ROW:

```
SELECT T_ID,T_FROM,T_TO  
FROM TICKETS WHERE T_ID>(SELECT T_ID FROM T_EXTRA WHERE  
T_PRICE=2500);
```



MULTI-ROW:

```
SELECT T_ID,T_FROM,T_TO  
FROM TICKETS WHERE T_ID=ANY(SELECT T_ID FROM T_EXTRA  
WHERE T_PRICE=2100);
```



- **Joining :**

Equijoin

1.show all the information of the PASSENGERS.

```
SELECT P.P_ID,P.P_NAME,P.P_NID,PC.P_CONTACT  
FROM PASSENGERS P, P_CONTACT PC  
WHERE P.P_ID=PC.P_ID;
```

The screenshot shows the Oracle Database Express Edition interface. The browser address bar indicates the URL: 127.0.0.1:8080/apex/f?p=4500:1003:1121399720897603::NO:1003-. The page title is "ORACLE Database Express Edition". The user is logged in as "SCOTT". The "SQL Commands" window is active, showing the following SQL query:

```
SELECT P.P_ID,P.P_NAME,P.P_NID,PC.P_CONTACT
FROM PASSGERS P,P_CONTACT PC
WHERE P.P_ID=PC.P_ID;
```

The query has been executed, and the results are displayed in a table with 4 columns: P_ID, P_NAME, P_NID, and P_CONTACT. There are 3 rows of data.

P_ID	P_NAME	P_NID	P_CONTACT
11	SAJIN	22-46342-1	01771000000
22	MOONPE	20-43989-2	01991000000
33	SADIA	22-46462-1	01081000000

Below the table, it states "3 rows returned in 0.00 seconds" and provides a "CSV Export" link. The footer of the application shows "Language: en-us" and "Application Express 2.1.0.00.39 Copyright © 1999, 2005, Oracle. All rights reserved." The Windows taskbar at the bottom shows the time as 5:38 PM on 5/15/2023.

2. SELF-JOIN:

```
SELECT A.A_NAME,B.A_STATE
FROM AIRPORT A,AIRPORT B
WHERE A.A_ID=B.A_ID
```

The screenshot shows the Oracle Database Express Edition interface. The browser address bar indicates the URL `127.0.0.1:8080/apex/f?p=4500:1003:1121399720897603::NO:1003-`. The user is logged in as SCOTT. The SQL Commands window contains the following query:

```
SELECT A.A_NAME, B.A_STATE
FROM AIRPORT A, AIRPORT B
WHERE A.A_ID=B.A_ID
```

The query results are displayed in a table with 4 rows:

A_NAME	A_STATE
DHAKA_AIRPORT	DHAKA
BARISHAL_AIRPORT	BARISHAL
COXS_BAZAR_AIRPORT	COXS_BAZAR
JOSHORE_AIRPORT	JOSHORE

4 rows returned in 0.02 seconds. The interface also includes a 'CSV Export' link and a footer with 'Language: en-us' and 'Application Express 2.1.0.00.39 Copyright © 1999, 2006, Oracle. All rights reserved.'

Outer join

```
SELECT T.T_ID, T.T_FROM, T.T_TO, T.DEPATURE, TE.T_TYPE, TE.T_PRICE
FROM TICKETS T, T_EXTRA TE
WHERE T.T_ID=TE.T_ID(+);
```


The screenshot shows the Oracle Database Express Edition interface. The top bar indicates the user is SCOTT. The main area contains a SQL query: `SELECT T.T_ID, T.T_FROM, T.T_TO, T.DEPARTURE, TE.T_TYPE, TE.T_PRICE FROM TICKETS T, T_EXTRA TE WHERE T.T_ID=TE.T_ID(+);`. Below the query, the results are displayed in a table with 5 rows. The table has columns: T_ID, T_FROM, T_TO, DEPARTURE, T_TYPE, and T_PRICE. The results show flights from DHAHA to USE and UAE with various departure times and prices. The bottom status bar indicates '5 rows returned in 0.01 seconds' and 'CSV Export'.

T_ID	T_FROM	T_TO	DEPARTURE	T_TYPE	T_PRICE
7171	DHAHA	USE	6:00 PM	ECONOMY	2100
8282	DHAHA	USE	6:00 PM	PRIME ECONOMY	2500
9292	DHAHA	USE	6:00 PM	BUSINESS	3100
1010	DHAHA	USE	6:00 PM	ECONOMY	2100
2020	DHAHA	UAE	8:00 PM	-	-

CONCLUSION: The airline management system automates the process of booking airline tickets, thus reducing the time wasted as well as the errors that are involved in the manual process. We analyzed different airline management System worldwide and tried to gather different features from them. We accumulated all the feature currently used by the airline management System. In this project we had to think about the various options which we can provide to user. We have tried to make this project user friendly and also interactive by providing many features.