CASE STUDY OF AIRPORT MANAGEMENT SYSTEM USING RELATIONAL DATABASE DESIGN

Case Study in Relational Database Design

- **Title:** Airport Management System

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- **Guide:** Jyoti Snehi

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Abstract

The objective of this thesis is to get some hands-on experience for creating the relational schemas and implementing the data extraction queries related to them. Our case study "Airport Management System" is presented. Input for this case study is taken from its informal specification to a relational schema using entity-relationship modeling and its translation to the relational model, to database schema, to implementation of the database, to interactive SQL querying of the installed database (Oracle).

Acknowledgments

We would like to express my gratitude to all of those who made it possible to complete this thesis, in particular to my supervisor Jyoti Snehi. We would also like to thank my family for their understanding and continuous support.

Chapter 1: Introduction

Database Management Systems

Database is a collection of data, in which we can retrieve, insert, delete data. It can also be organized into tables, schema, views, etc.
Database Management Systems is a software that is used to manage databases.
It provides us an interface that can be used to perform operations like database creation, creating tables, updating data, etc.
It helps us control data redundancy, and because it is centralized we can easily maintain the database.
We can easily backup the data and restore it in case of a software or hardware failure.

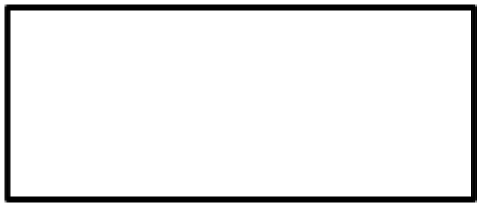
Relational Database Management System:

Relational Database Management System is a collection of programs that help us to create, delete, update, administer and interact with the database. The data in a RDBMS is stored in the form of tables. And it is accessed using ***Structured Query Language.***
It is the most popular database system among companies. It also provides us with data dictionaries and metadata which is useful in data handling.They provide a systematic view of data which helps in better understanding and decision making process.

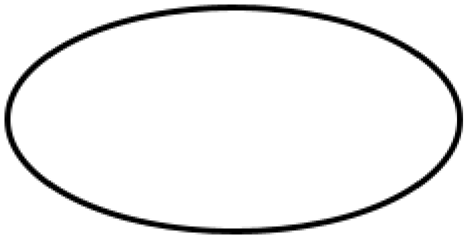
ER Model

ER Model stands for Entity Relationship Model, It displays the relationship of entity sets stored in a database.
It uses different symbols like rectangles to represent entities, ovals to define attributes and diamonds to represent relationships, etc.
It helps in creating the blueprint of the database. Also it gives a preview of how the tables should connect.

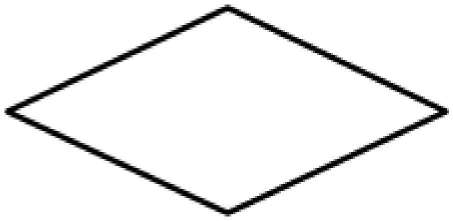
Main components and symbols of ER Model



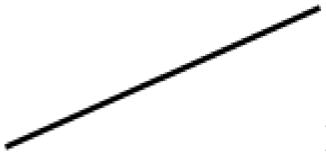
Rectangles: This is used to represent the entity types.



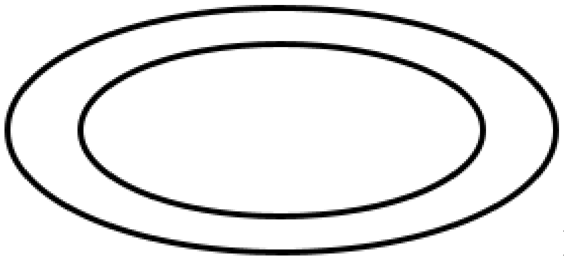
Ellipses: It is used to represent the attributes.



Diamond: It is used to represent relationship types.



Lines: It links attributes to entity types and entity types with other relationship types.



Double Ellipses: It is used to represent multi-valued attributes.

Brief introduction of case study

We have chosen to produce an Airport management System as our case study. In our project we have depicted how airport management works.This provides us with details like airports, the Airline companies, details about passengers and employees. Detailed description is discussed further.

Objective of the case study

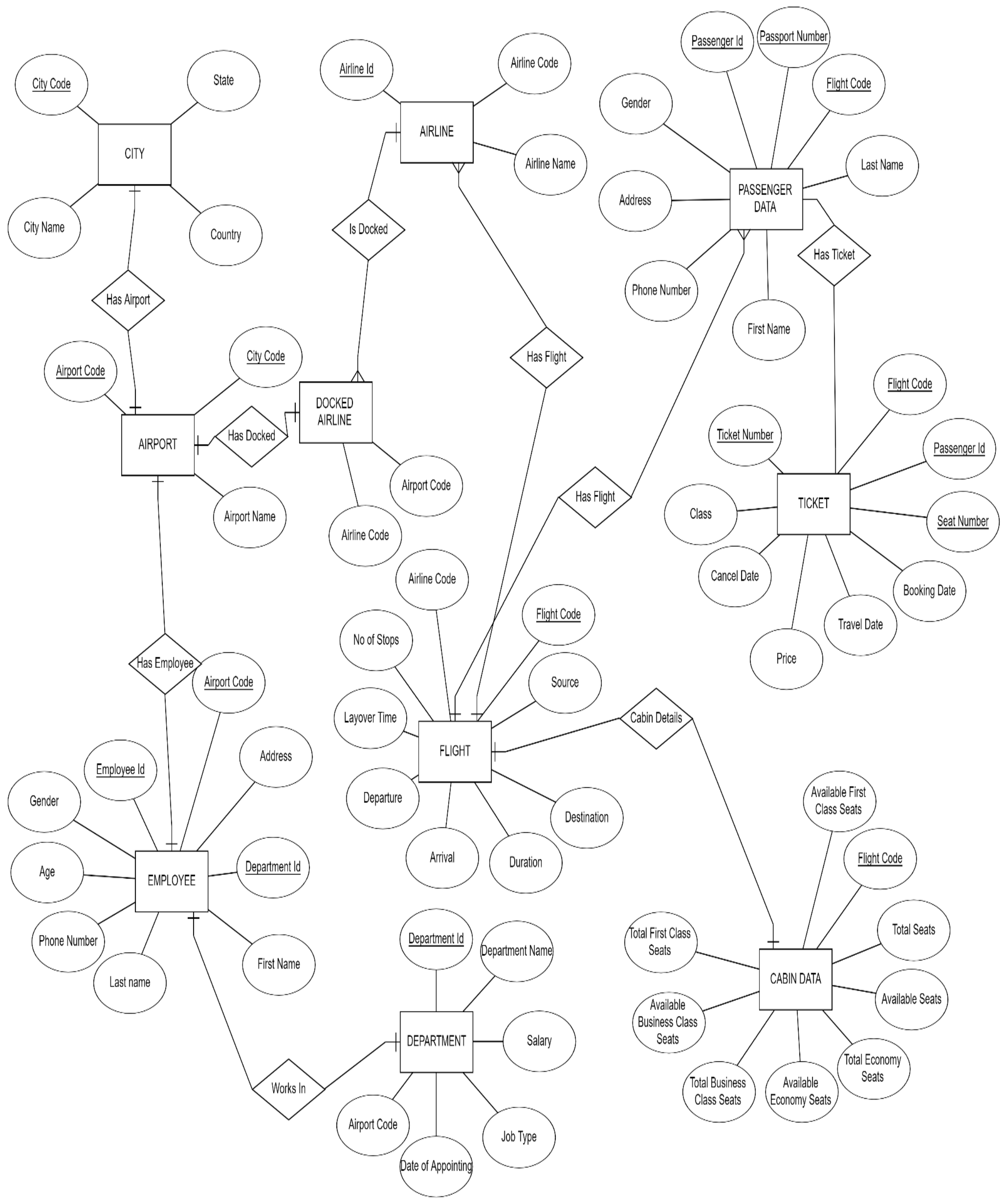
We made this project to make the work easier for the managing team of the airport. With this they can easily access the details of flights, details of passengers travelling, status of flights, Also it can help them Monitor the flight schedule.

Chapter 2: Airport Management System

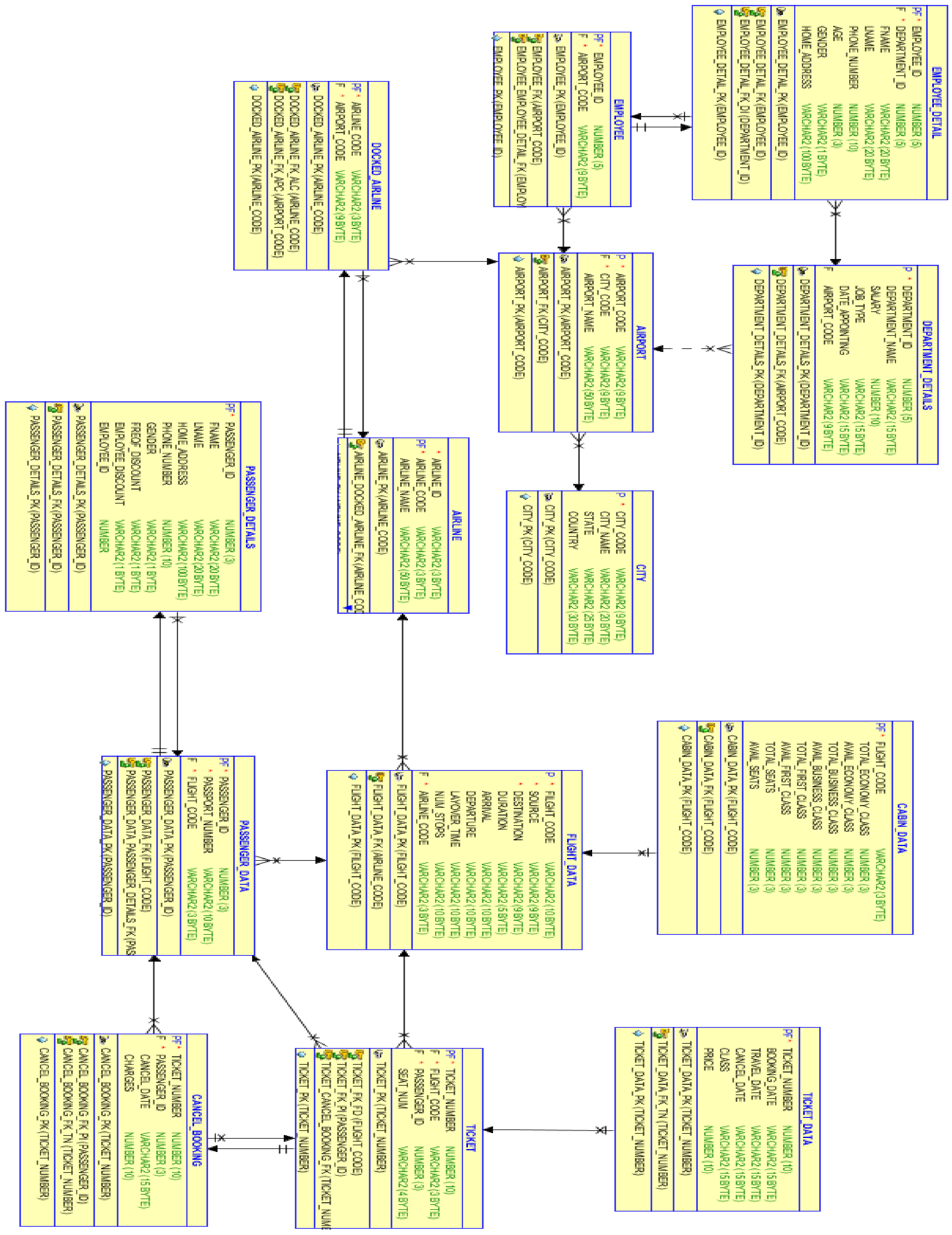
An informal specification of the project

In this system a passenger can see how many seats are available in his particular flight, the flight status, and check if he is eligible for discounts.
If an employee travels, he/she is also eligible for employee discounts.
Passengers can also get discounts if they have flight points they can redeem those points.

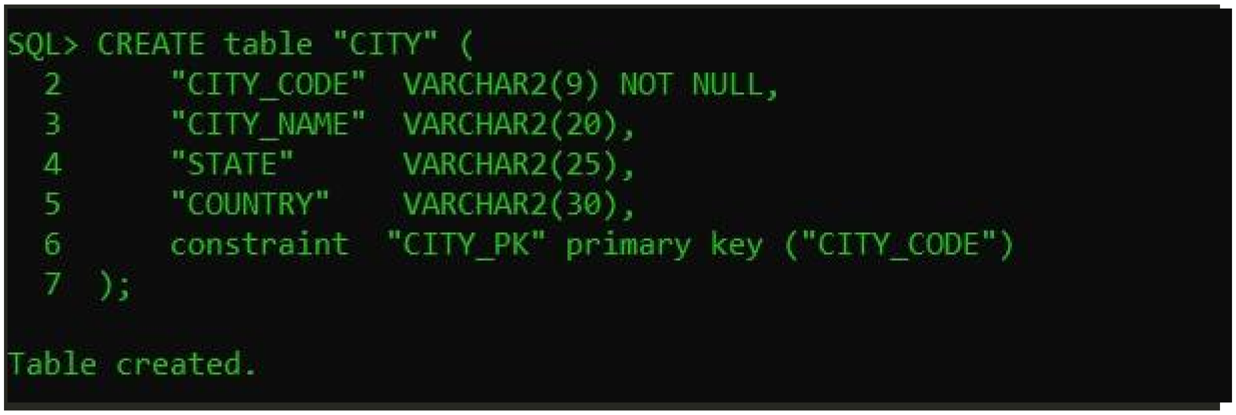
An Entity-Relationship Model (Made using erdplus.com)



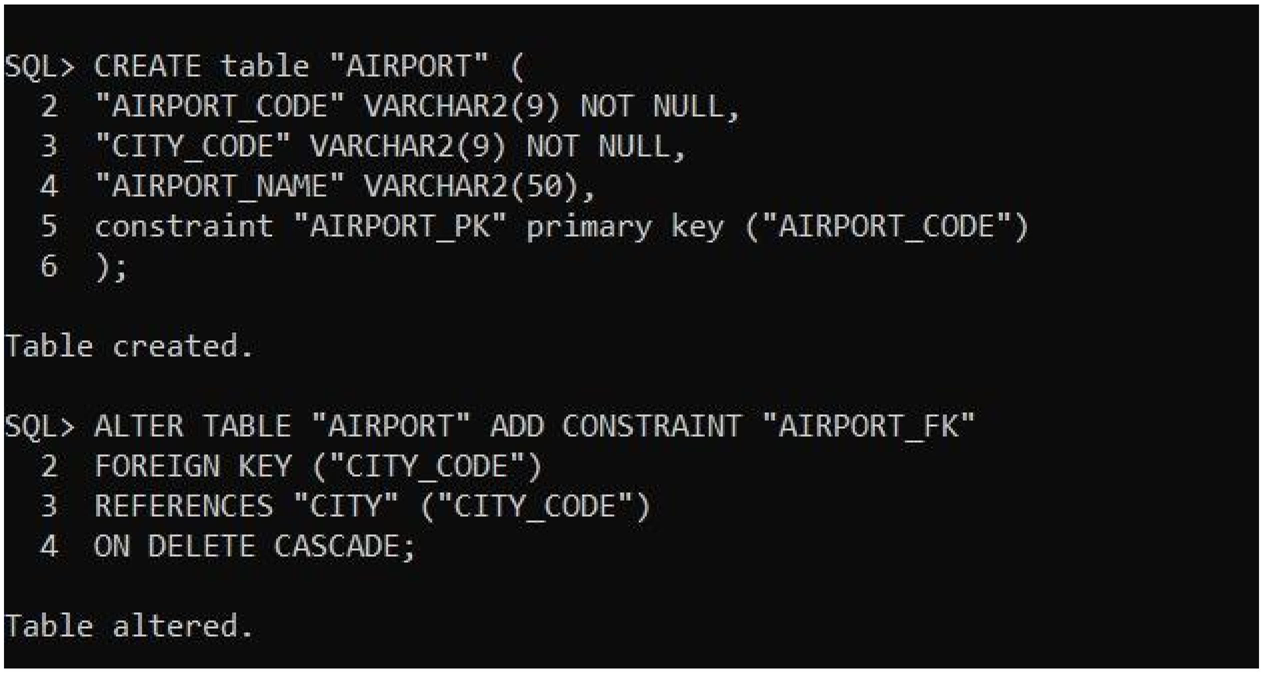
Case study Logical Model **(made using Oracle SQL Developer)**


EMPLOYEE_DETAIL
PF * EMPLOYEE_ID NUMBER (5)
F * DEPARTMENT_ID NUMBER (5)
FNAME VARCHAR2 (20 BYTE)
LNAME VARCHAR2 (20 BYTE)
PHONE_NUMBER NUMBER (10)
AGE NUMBER (3)
GENDER VARCHAR2 (1 BYTE)
HOME_ADDRESS VARCHAR2 (100 BYTE)
EMPLOYEE_DETAIL_PK (EMPLOYEE_ID)
EMPLOYEE_DETAIL_FK (EMPLOYEE_ID)
EMPLOYEE_DETAIL_FK_DI (DEPARTMENT_ID)
EMPLOYEE_DETAIL_PK (EMPLOYEE_ID)
EMPLOYEE
PF * EMPLOYEE_ID NUMBER (5)
F * AIRPORT_CODE VARCHAR2 (9 BYTE)
EMPLOYEE_PK (EMPLOYEE_ID)
EMPLOYEE_FK (AIRPORT_CODE)
EMPLOYEE_EMPLOYEE_DETAIL_FK (EMPLOY
EMPLOYEE_PK (EMPLOYEE_ID)
DOCKED_AIRLINE
PF * AIRLINE_CODE VARCHAR2 (3 BYTE)
F * AIRPORT_CODE VARCHAR2 (9 BYTE)
DOCKED_AIRLINE_PK (AIRLINE_CODE)
DOCKED_AIRLINE_FK_ALC (AIRLINE_CODE)
DOCKED_AIRLINE_FK_APC (AIRPORT_CODE)
DOCKED_AIRLINE_PK (AIRLINE_CODE)
AIRPORT
P * AIRPORT_CODE VARCHAR2 (9 BYTE)
F * CITY_CODE VARCHAR2 (9 BYTE)
AIRPORT_NAME VARCHAR2 (50 BYTE)
AIRPORT_PK (AIRPORT_CODE)
AIRPORT_FK (CITY_CODE)
AIRPORT_PK (AIRPORT_CODE)
DEPARTMENT_DETAILS
P * DEPARTMENT_ID NUMBER (5)
DEPARTMENT_NAME VARCHAR2 (15 BYTE)
SALARY NUMBER (10)
JOB_TYPE VARCHAR2 (15 BYTE)
DATE_APPOINTING VARCHAR2 (15 BYTE)
F AIRPORT_CODE VARCHAR2 (9 BYTE)
DEPARTMENT_DETAILS_PK (DEPARTMENT_ID)
DEPARTMENT_DETAILS_FK (AIRPORT_CODE)
DEPARTMENT_DETAILS_PK (DEPARTMENT_ID)
CITY
P * CITY_CODE VARCHAR2 (9 BYTE)
CITY_NAME VARCHAR2 (20 BYTE)
STATE VARCHAR2 (25 BYTE)
COUNTRY VARCHAR2 (30 BYTE)
CITY_PK (CITY_CODE)
CITY_PK (CITY_CODE)
AIRLINE
* AIRLINE_ID VARCHAR2 (3 BYTE)
PF * AIRLINE_CODE VARCHAR2 (3 BYTE)
AIRLINE_NAME VARCHAR2 (50 BYTE)
AIRLINE_PK (AIRLINE_CODE)
AIRLINE_DOCKED_AIRLINE_FK (AIRLINE_COD
PASSENGER_DETAILS
PF * PASSENGER_ID NUMBER (3)
FNAME VARCHAR2 (20 BYTE)
LNAME VARCHAR2 (20 BYTE)
HOME_ADDRESS VARCHAR2 (100 BYTE)
PHONE_NUMBER NUMBER (10)
GENDER VARCHAR2 (1 BYTE)
FREQF_DISCOUNT VARCHAR2 (1 BYTE)
EMPLOYEE_DISCOUNT VARCHAR2 (1 BYTE)
EMPLOYEE_ID NUMBER
PASSENGER_DETAILS_PK (PASSENGER_ID)
PASSENGER_DETAILS_FK (PASSENGER_ID)
PASSENGER_DETAILS_PK (PASSENGER_ID)
PASSENGER_DATA
PF * PASSENGER_ID NUMBER (3)
* PASSPORT_NUMBER VARCHAR2 (10 BYTE)
F FLIGHT_CODE VARCHAR2 (3 BYTE)
PASSENGER_DATA_PK (PASSENGER_ID)
PASSENGER_DATA_FK (FLIGHT_CODE)
PASSENGER_DATA_PASSENGER_DETAILS_FK (PAS
PASSENGER_DATA_PK (PASSENGER_ID)
FLIGHT_DATA
P * FLIGHT_CODE VARCHAR2 (10 BYTE)
* SOURCE VARCHAR2 (9 BYTE)
* DESTINATION VARCHAR2 (9 BYTE)
DURATION VARCHAR2 (5 BYTE)
ARRIVAL VARCHAR2 (10 BYTE)
DEPARTURE VARCHAR2 (10 BYTE)
LAYOVER_TIME VARCHAR2 (10 BYTE)
NUM_STOPS VARCHAR2 (10 BYTE)
F AIRLINE_CODE VARCHAR2 (3 BYTE)
FLIGHT_DATA_PK (FLIGHT_CODE)
FLIGHT_DATA_FK (AIRLINE_CODE)
FLIGHT_DATA_PK (FLIGHT_CODE)
CABIN_DATA
PF * FLIGHT_CODE VARCHAR2 (3 BYTE)
TOTAL_ECONOMY_CLASS NUMBER (3)
AVAIL_ECONOMY_CLASS NUMBER (3)
TOTAL_BUSINESS_CLASS NUMBER (3)
AVAIL_BUSINESS_CLASS NUMBER (3)
TOTAL_FIRST_CLASS NUMBER (3)
AVAIL_FIRST_CLASS NUMBER (3)
TOTAL_SEATS NUMBER (3)
AVAIL_SEATS NUMBER (3)
CABIN_DATA_PK (FLIGHT_CODE)
CABIN_DATA_FK (FLIGHT_CODE)
CABIN_DATA_PK (FLIGHT_CODE)
CANCEL_BOOKING
PF * TICKET_NUMBER NUMBER (10)
F * PASSENGER_ID NUMBER (3)
CANCEL_DATE VARCHAR2 (15 BYTE)
CHARGES NUMBER (10)
CANCEL_BOOKING_PK (TICKET_NUMBER)
CANCEL_BOOKING_FK_PI (PASSENGER_ID)
CANCEL_BOOKING_FK_TN (TICKET_NUMBER)
CANCEL_BOOKING_PK (TICKET_NUMBER)
TICKET
PF * TICKET_NUMBER NUMBER (10)
F * FLIGHT_CODE VARCHAR2 (3 BYTE)
F * PASSENGER_ID NUMBER (3)
SEAT_NUM VARCHAR2 (4 BYTE)
TICKET_PK (TICKET_NUMBER)
TICKET_FK_FD (FLIGHT_CODE)
TICKET_FK_PI (PASSENGER_ID)
TICKET_CANCEL_BOOKING_FK (TICKET_NUM
TICKET_PK (TICKET_NUMBER)
TICKET_DATA
PF * TICKET_NUMBER NUMBER (10)
BOOKING_DATE VARCHAR2 (15 BYTE)
TRAVEL_DATE VARCHAR2 (15 BYTE)
CANCEL_DATE VARCHAR2 (15 BYTE)
CLASS VARCHAR2 (15 BYTE)
PRICE NUMBER (10)
TICKET_DATA_PK (TICKET_NUMBER)
TICKET_DATA_FK_TN (TICKET_NUMBER)
TICKET_DATA_PK (TICKET_NUMBER)

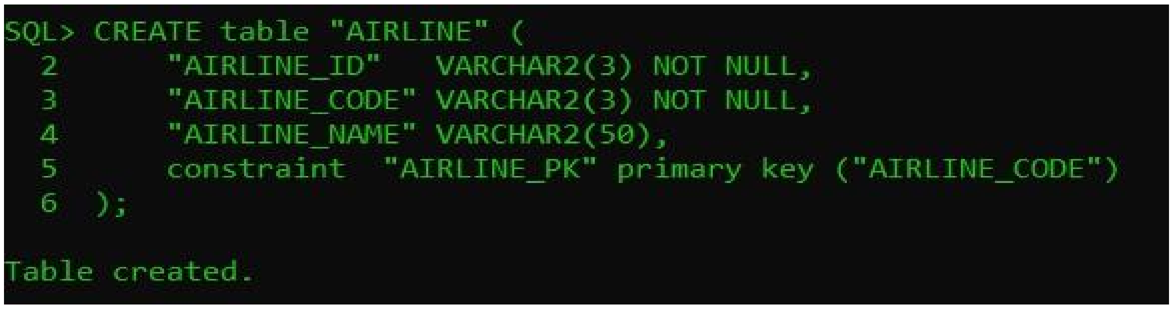
Database Schema



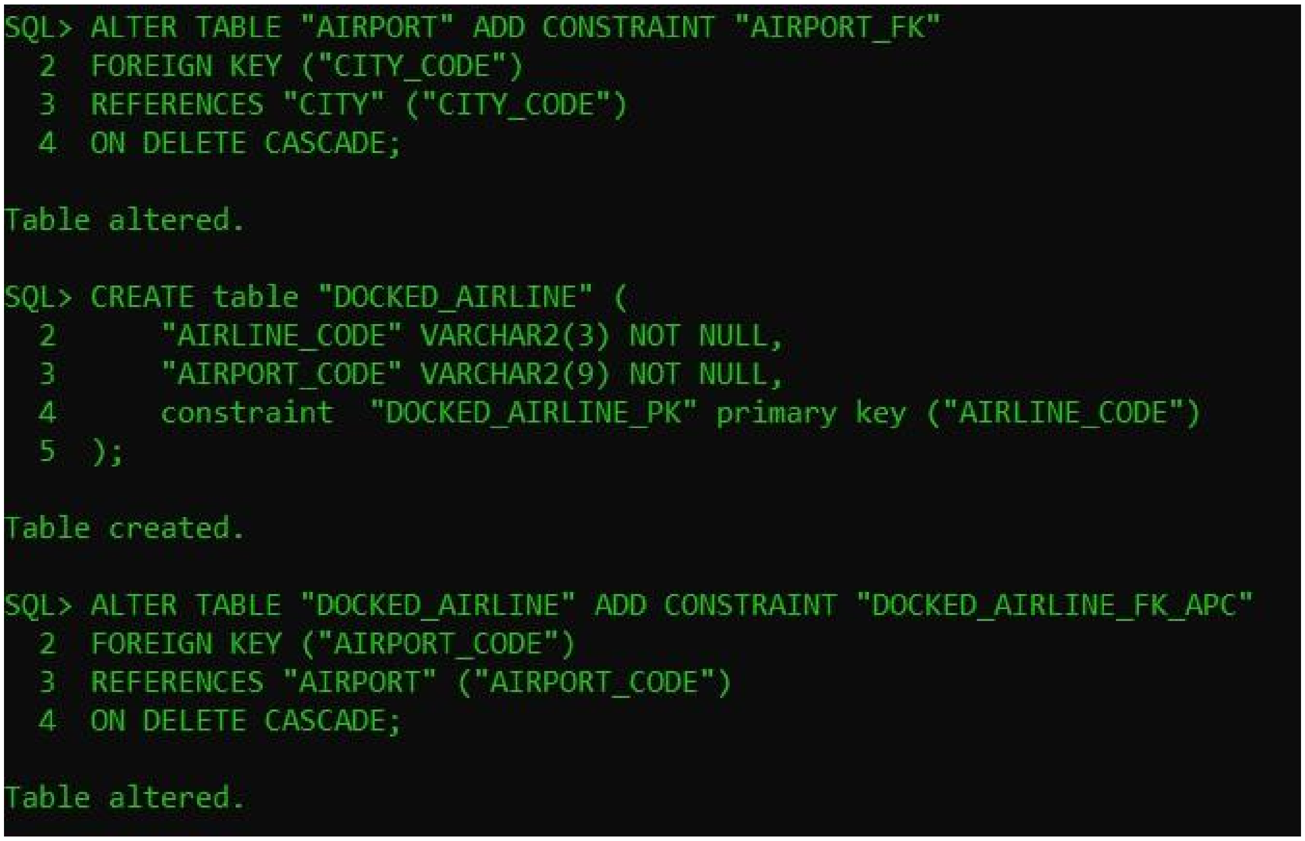
```
SQL> CREATE table "CITY" (
         "CITY_CODE"   VARCHAR2(9) NOT NULL,
         "CITY_NAME"   VARCHAR2(20),
         "STATE"       VARCHAR2(25),
         "COUNTRY"     VARCHAR2(30),
         constraint  "CITY_PK" primary key ("CITY_CODE")
     );

Table created.
```



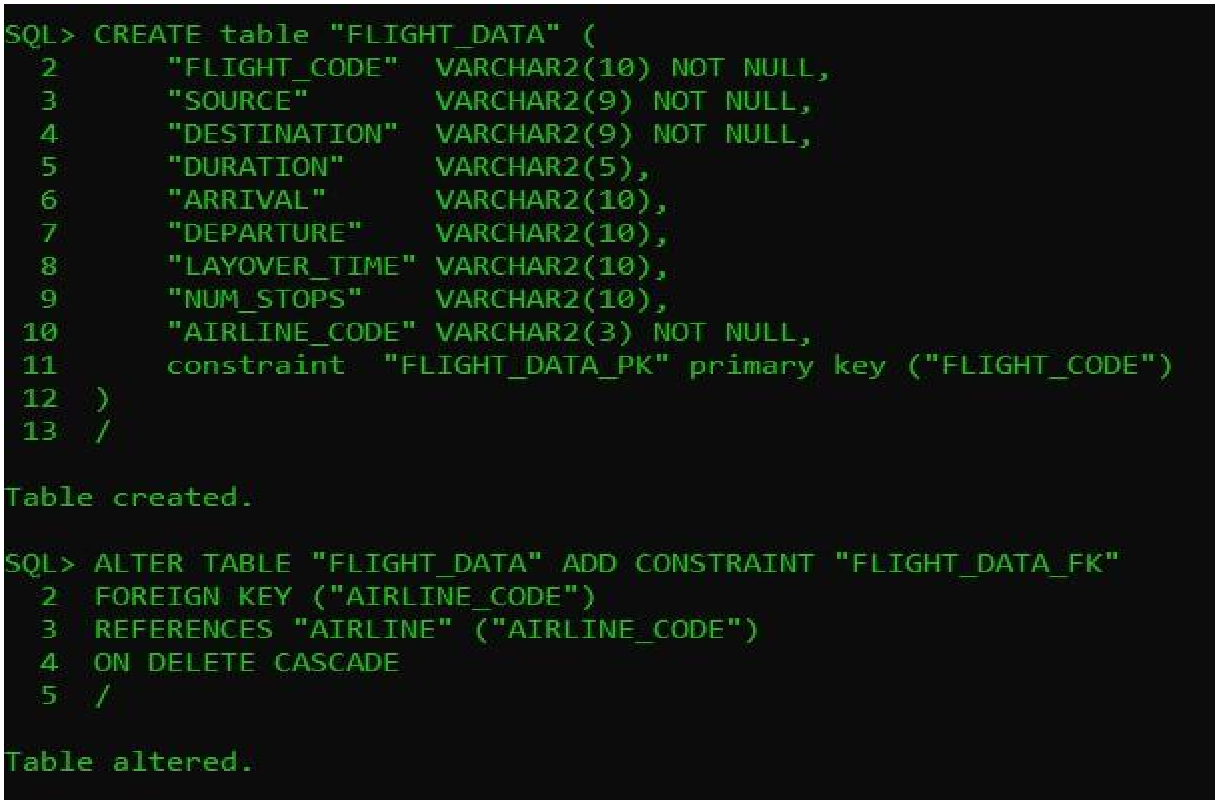
```
SQL> CREATE table "AIRPORT" (
     "AIRPORT_CODE" VARCHAR2(9) NOT NULL,
     "CITY_CODE" VARCHAR2(9) NOT NULL,
     "AIRPORT_NAME" VARCHAR2(50),
     constraint "AIRPORT_PK" primary key ("AIRPORT_CODE")
     );

Table created.

SQL> ALTER TABLE "AIRPORT" ADD CONSTRAINT "AIRPORT_FK"
     FOREIGN KEY ("CITY_CODE")
     REFERENCES "CITY" ("CITY_CODE")
     ON DELETE CASCADE;

Table altered.
```



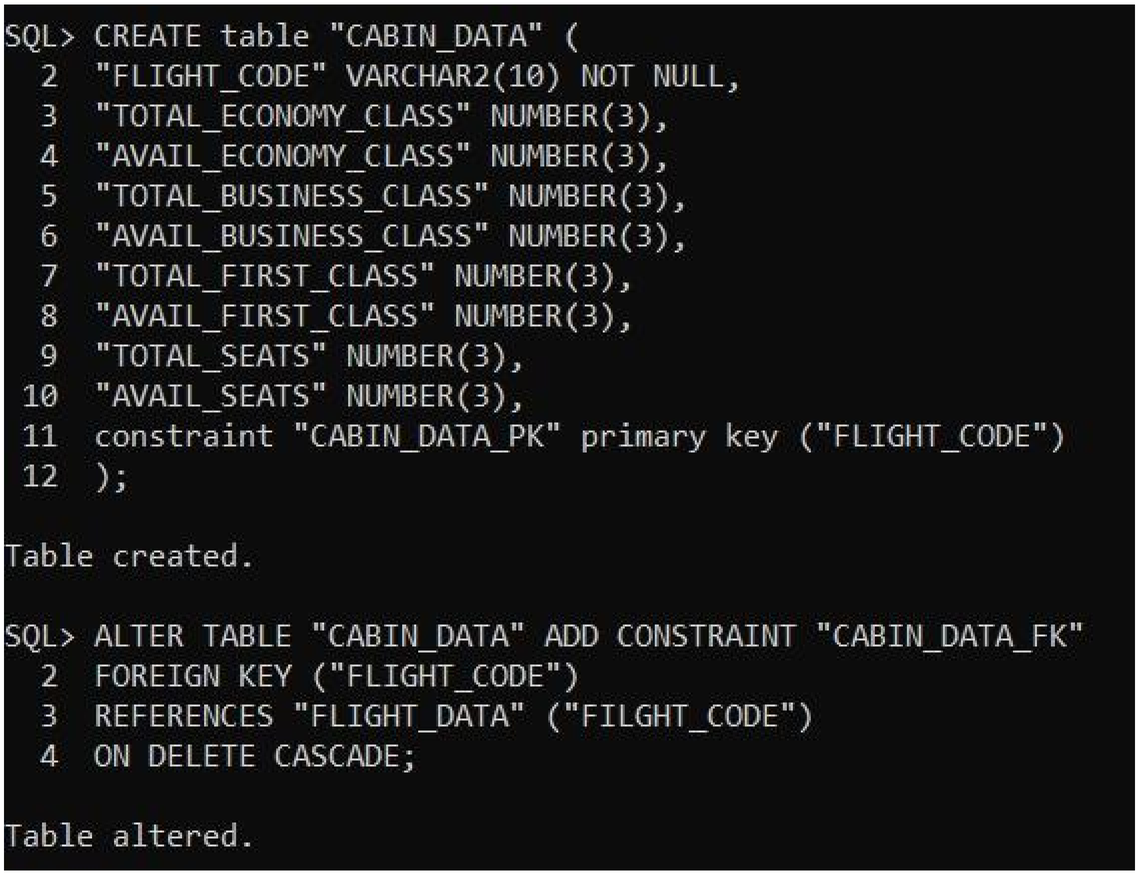
```
SQL> CREATE table "AIRLINE" (
         "AIRLINE_ID"   VARCHAR2(3) NOT NULL,
         "AIRLINE_CODE" VARCHAR2(3) NOT NULL,
         "AIRLINE_NAME" VARCHAR2(50),
         constraint  "AIRLINE_PK" primary key ("AIRLINE_CODE")
     );

Table created.
```



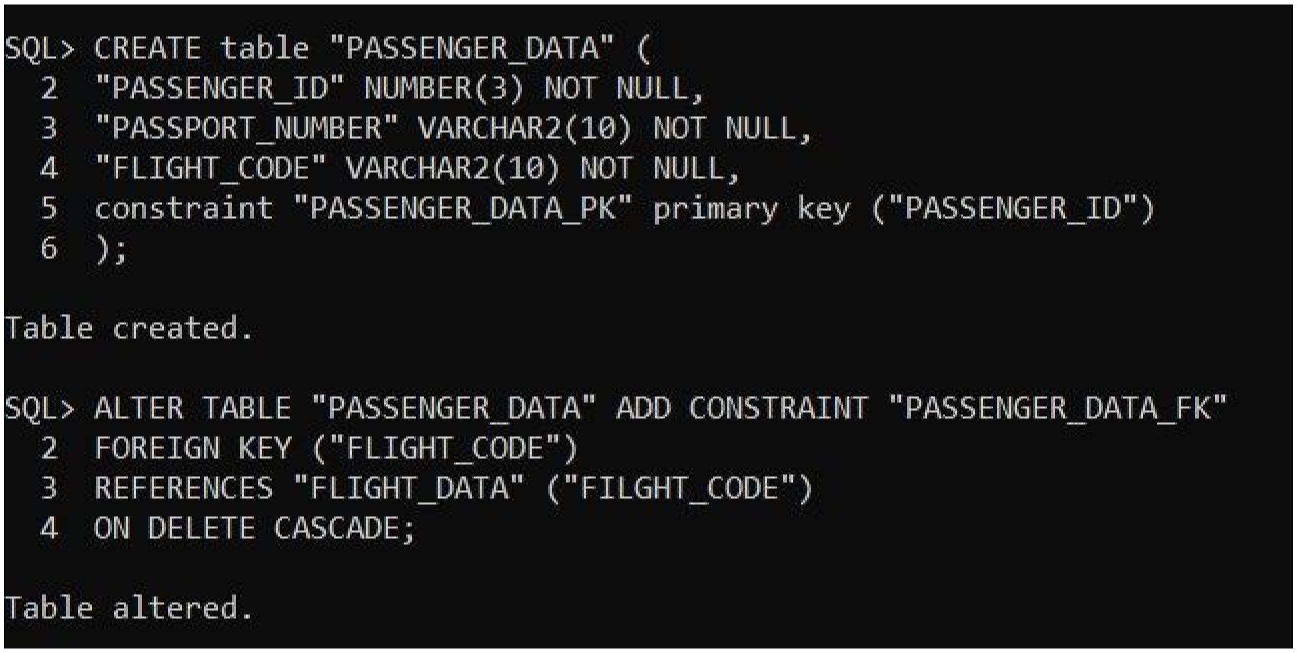
```
SQL> ALTER TABLE "AIRPORT" ADD CONSTRAINT "AIRPORT_FK"
FOREIGN KEY ("CITY_CODE")
REFERENCES "CITY" ("CITY_CODE")
ON DELETE CASCADE;

Table altered.

SQL> CREATE table "DOCKED_AIRLINE" (
    "AIRLINE_CODE" VARCHAR2(3) NOT NULL,
    "AIRPORT_CODE" VARCHAR2(9) NOT NULL,
    constraint  "DOCKED_AIRLINE_PK" primary key ("AIRLINE_CODE")
);

Table created.

SQL> ALTER TABLE "DOCKED_AIRLINE" ADD CONSTRAINT "DOCKED_AIRLINE_FK_APC"
FOREIGN KEY ("AIRPORT_CODE")
REFERENCES "AIRPORT" ("AIRPORT_CODE")
ON DELETE CASCADE;

Table altered.
```



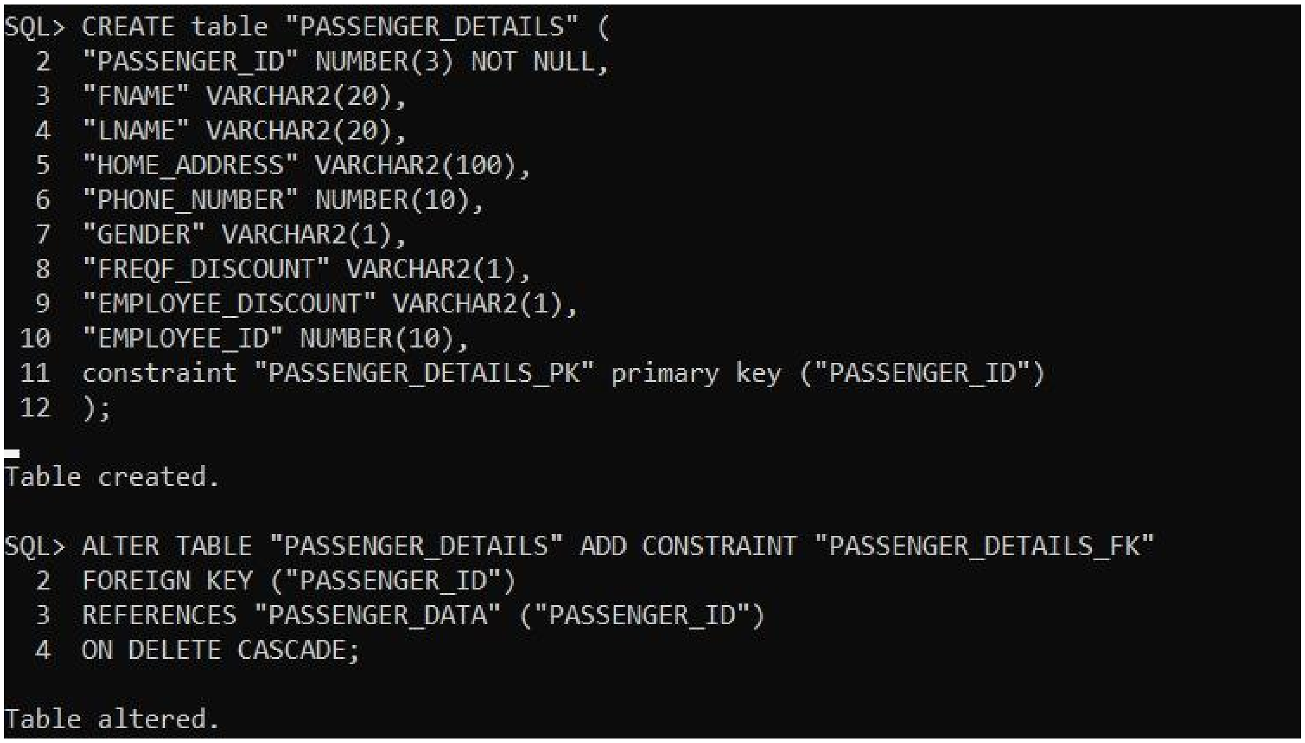
```
SQL> CREATE table "FLIGHT_DATA" (
    "FLIGHT_CODE"  VARCHAR2(10) NOT NULL,
    "SOURCE"       VARCHAR2(9) NOT NULL,
    "DESTINATION"  VARCHAR2(9) NOT NULL,
    "DURATION"     VARCHAR2(5),
    "ARRIVAL"      VARCHAR2(10),
    "DEPARTURE"    VARCHAR2(10),
    "LAYOVER_TIME" VARCHAR2(10),
    "NUM_STOPS"    VARCHAR2(10),
    "AIRLINE_CODE" VARCHAR2(3) NOT NULL,
    constraint  "FLIGHT_DATA_PK" primary key ("FLIGHT_CODE")
)
/

Table created.

SQL> ALTER TABLE "FLIGHT_DATA" ADD CONSTRAINT "FLIGHT_DATA_FK"
FOREIGN KEY ("AIRLINE_CODE")
REFERENCES "AIRLINE" ("AIRLINE_CODE")
ON DELETE CASCADE
/

Table altered.
```



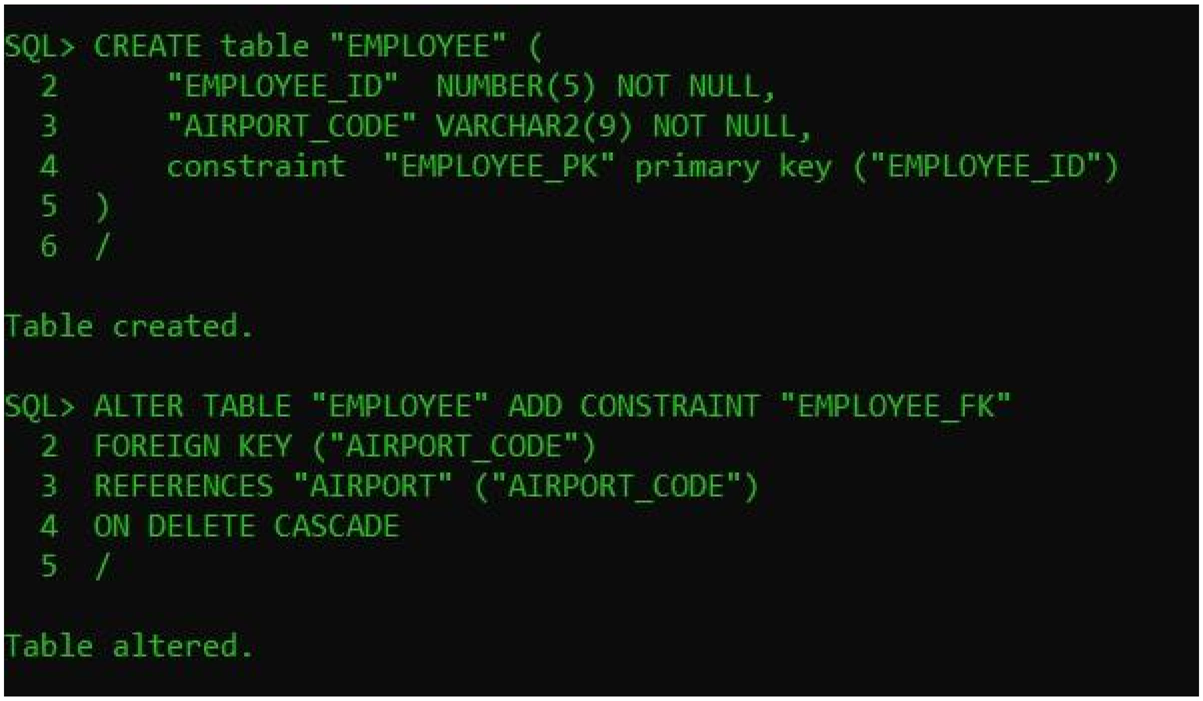
```
SQL> CREATE table "CABIN_DATA" (
"FLIGHT_CODE" VARCHAR2(10) NOT NULL,
"TOTAL_ECONOMY_CLASS" NUMBER(3),
"AVAIL_ECONOMY_CLASS" NUMBER(3),
"TOTAL_BUSINESS_CLASS" NUMBER(3),
"AVAIL_BUSINESS_CLASS" NUMBER(3),
"TOTAL_FIRST_CLASS" NUMBER(3),
"AVAIL_FIRST_CLASS" NUMBER(3),
"TOTAL_SEATS" NUMBER(3),
"AVAIL_SEATS" NUMBER(3),
constraint "CABIN_DATA_PK" primary key ("FLIGHT_CODE")
);

Table created.

SQL> ALTER TABLE "CABIN_DATA" ADD CONSTRAINT "CABIN_DATA_FK"
FOREIGN KEY ("FLIGHT_CODE")
REFERENCES "FLIGHT_DATA" ("FILGHT_CODE")
ON DELETE CASCADE;

Table altered.
```



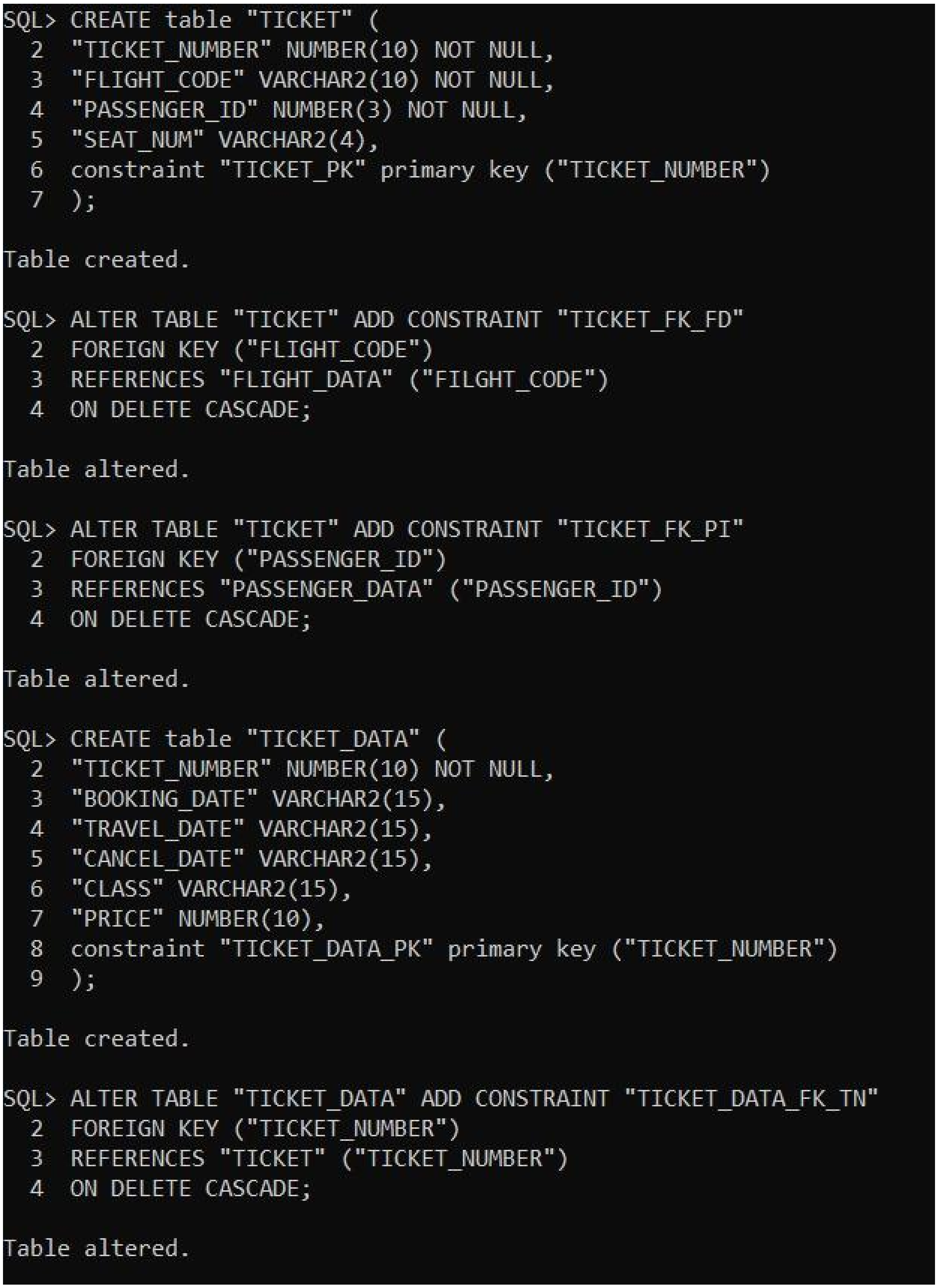
```
SQL> CREATE table "PASSENGER_DATA" (
"PASSENGER_ID" NUMBER(3) NOT NULL,
"PASSPORT_NUMBER" VARCHAR2(10) NOT NULL,
"FLIGHT_CODE" VARCHAR2(10) NOT NULL,
constraint "PASSENGER_DATA_PK" primary key ("PASSENGER_ID")
);

Table created.

SQL> ALTER TABLE "PASSENGER_DATA" ADD CONSTRAINT "PASSENGER_DATA_FK"
FOREIGN KEY ("FLIGHT_CODE")
REFERENCES "FLIGHT_DATA" ("FILGHT_CODE")
ON DELETE CASCADE;

Table altered.
```



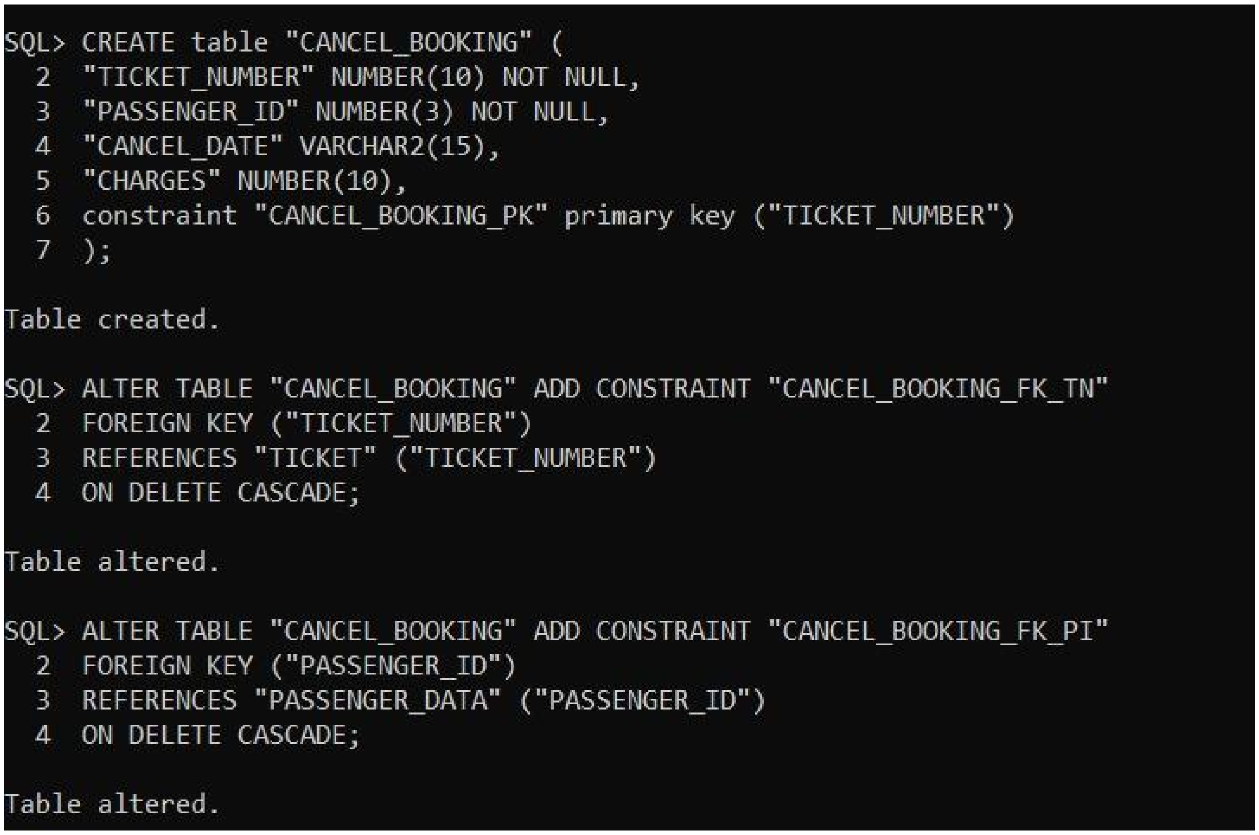
```
SQL> CREATE table "PASSENGER_DETAILS" (
     "PASSENGER_ID" NUMBER(3) NOT NULL,
     "FNAME" VARCHAR2(20),
     "LNAME" VARCHAR2(20),
     "HOME_ADDRESS" VARCHAR2(100),
     "PHONE_NUMBER" NUMBER(10),
     "GENDER" VARCHAR2(1),
     "FREQF_DISCOUNT" VARCHAR2(1),
     "EMPLOYEE_DISCOUNT" VARCHAR2(1),
     "EMPLOYEE_ID" NUMBER(10),
     constraint "PASSENGER_DETAILS_PK" primary key ("PASSENGER_ID")
     );

Table created.

SQL> ALTER TABLE "PASSENGER_DETAILS" ADD CONSTRAINT "PASSENGER_DETAILS_FK"
     FOREIGN KEY ("PASSENGER_ID")
     REFERENCES "PASSENGER_DATA" ("PASSENGER_ID")
     ON DELETE CASCADE;

Table altered.
```



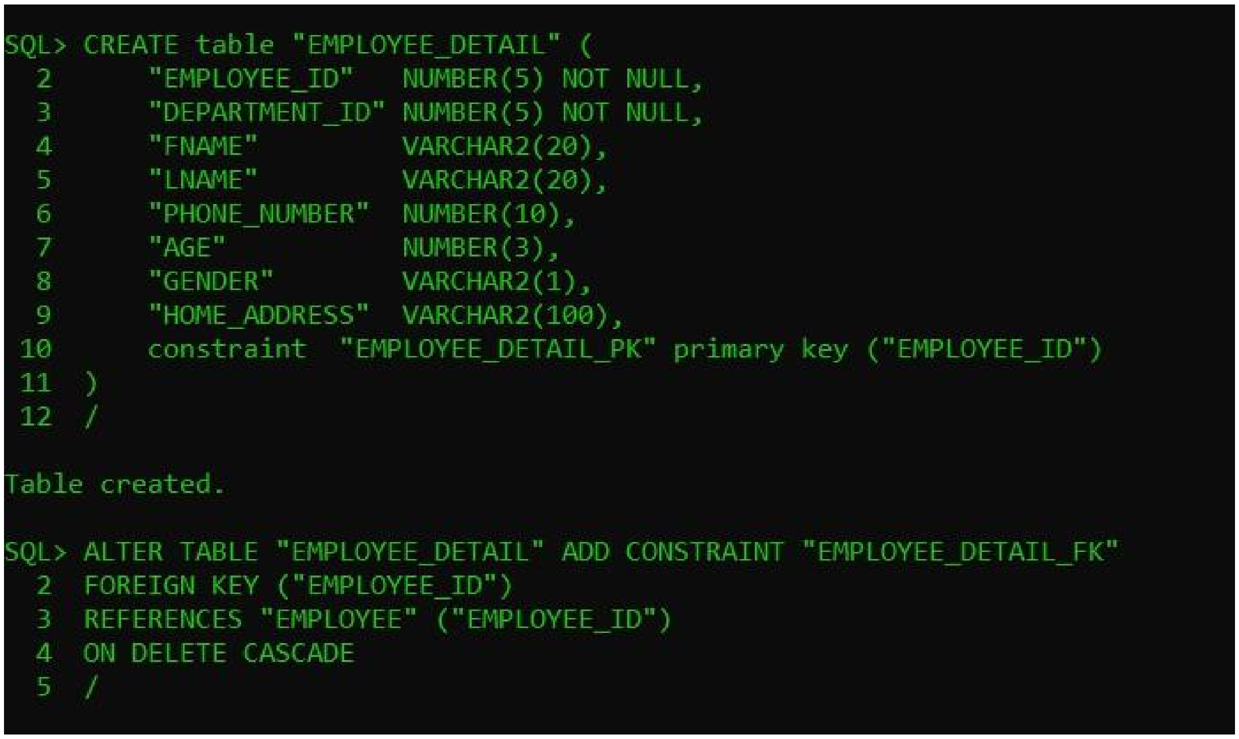
```
SQL> CREATE table "EMPLOYEE" (
         "EMPLOYEE_ID"  NUMBER(5) NOT NULL,
         "AIRPORT_CODE" VARCHAR2(9) NOT NULL,
         constraint  "EMPLOYEE_PK" primary key ("EMPLOYEE_ID")
     )
     /

Table created.

SQL> ALTER TABLE "EMPLOYEE" ADD CONSTRAINT "EMPLOYEE_FK"
     FOREIGN KEY ("AIRPORT_CODE")
     REFERENCES "AIRPORT" ("AIRPORT_CODE")
     ON DELETE CASCADE
     /

Table altered.
```



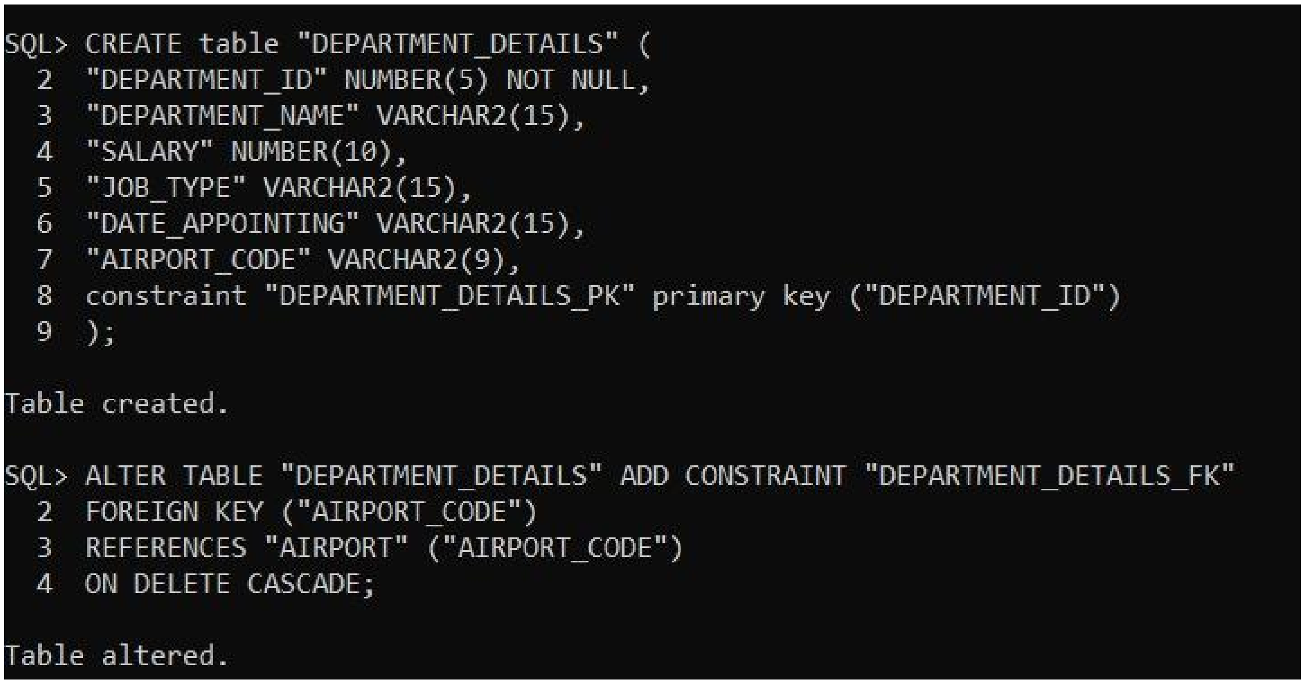
```
SQL> CREATE table "TICKET" (
     "TICKET_NUMBER" NUMBER(10) NOT NULL,
     "FLIGHT_CODE" VARCHAR2(10) NOT NULL,
     "PASSENGER_ID" NUMBER(3) NOT NULL,
     "SEAT_NUM" VARCHAR2(4),
     constraint "TICKET_PK" primary key ("TICKET_NUMBER")
     );

Table created.

SQL> ALTER TABLE "TICKET" ADD CONSTRAINT "TICKET_FK_FD"
     FOREIGN KEY ("FLIGHT_CODE")
     REFERENCES "FLIGHT_DATA" ("FILGHT_CODE")
     ON DELETE CASCADE;

Table altered.

SQL> ALTER TABLE "TICKET" ADD CONSTRAINT "TICKET_FK_PI"
     FOREIGN KEY ("PASSENGER_ID")
     REFERENCES "PASSENGER_DATA" ("PASSENGER_ID")
     ON DELETE CASCADE;

Table altered.

SQL> CREATE table "TICKET_DATA" (
     "TICKET_NUMBER" NUMBER(10) NOT NULL,
     "BOOKING_DATE" VARCHAR2(15),
     "TRAVEL_DATE" VARCHAR2(15),
     "CANCEL_DATE" VARCHAR2(15),
     "CLASS" VARCHAR2(15),
     "PRICE" NUMBER(10),
     constraint "TICKET_DATA_PK" primary key ("TICKET_NUMBER")
     );

Table created.

SQL> ALTER TABLE "TICKET_DATA" ADD CONSTRAINT "TICKET_DATA_FK_TN"
     FOREIGN KEY ("TICKET_NUMBER")
     REFERENCES "TICKET" ("TICKET_NUMBER")
     ON DELETE CASCADE;

Table altered.
```



```
SQL> CREATE table "CANCEL_BOOKING" (
  2  "TICKET_NUMBER" NUMBER(10) NOT NULL,
  3  "PASSENGER_ID" NUMBER(3) NOT NULL,
  4  "CANCEL_DATE" VARCHAR2(15),
  5  "CHARGES" NUMBER(10),
  6  constraint "CANCEL_BOOKING_PK" primary key ("TICKET_NUMBER")
  7  );

Table created.

SQL> ALTER TABLE "CANCEL_BOOKING" ADD CONSTRAINT "CANCEL_BOOKING_FK_TN"
  2  FOREIGN KEY ("TICKET_NUMBER")
  3  REFERENCES "TICKET" ("TICKET_NUMBER")
  4  ON DELETE CASCADE;

Table altered.

SQL> ALTER TABLE "CANCEL_BOOKING" ADD CONSTRAINT "CANCEL_BOOKING_FK_PI"
  2  FOREIGN KEY ("PASSENGER_ID")
  3  REFERENCES "PASSENGER_DATA" ("PASSENGER_ID")
  4  ON DELETE CASCADE;

Table altered.
```



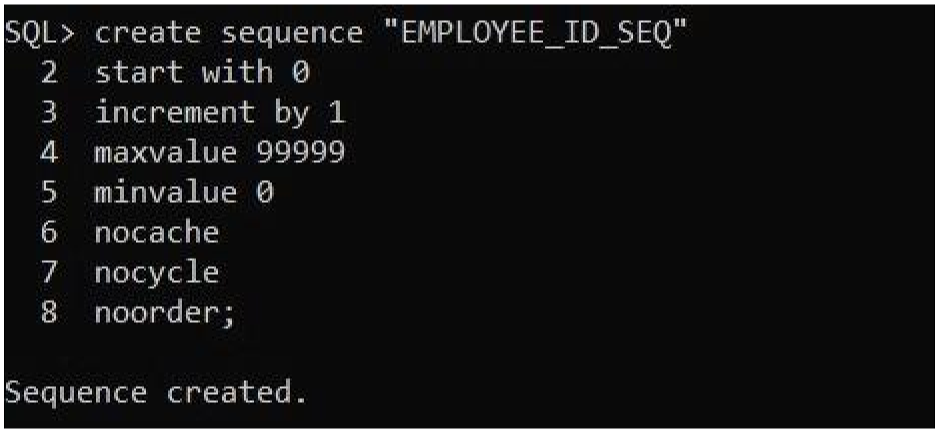
```
SQL> CREATE table "EMPLOYEE_DETAIL" (
  2      "EMPLOYEE_ID"   NUMBER(5) NOT NULL,
  3      "DEPARTMENT_ID" NUMBER(5) NOT NULL,
  4      "FNAME"         VARCHAR2(20),
  5      "LNAME"         VARCHAR2(20),
  6      "PHONE_NUMBER"  NUMBER(10),
  7      "AGE"           NUMBER(3),
  8      "GENDER"        VARCHAR2(1),
  9      "HOME_ADDRESS"  VARCHAR2(100),
 10      constraint  "EMPLOYEE_DETAIL_PK" primary key ("EMPLOYEE_ID")
 11  )
 12  /

Table created.

SQL> ALTER TABLE "EMPLOYEE_DETAIL" ADD CONSTRAINT "EMPLOYEE_DETAIL_FK"
  2  FOREIGN KEY ("EMPLOYEE_ID")
  3  REFERENCES "EMPLOYEE" ("EMPLOYEE_ID")
  4  ON DELETE CASCADE
  5  /
```



```
SQL> CREATE table "DEPARTMENT_DETAILS" (
     "DEPARTMENT_ID" NUMBER(5) NOT NULL,
     "DEPARTMENT_NAME" VARCHAR2(15),
     "SALARY" NUMBER(10),
     "JOB_TYPE" VARCHAR2(15),
     "DATE_APPOINTING" VARCHAR2(15),
     "AIRPORT_CODE" VARCHAR2(9),
     constraint "DEPARTMENT_DETAILS_PK" primary key ("DEPARTMENT_ID")
     );

Table created.

SQL> ALTER TABLE "DEPARTMENT_DETAILS" ADD CONSTRAINT "DEPARTMENT_DETAILS_FK"
     FOREIGN KEY ("AIRPORT_CODE")
     REFERENCES "AIRPORT" ("AIRPORT_CODE")
     ON DELETE CASCADE;

Table altered.
```

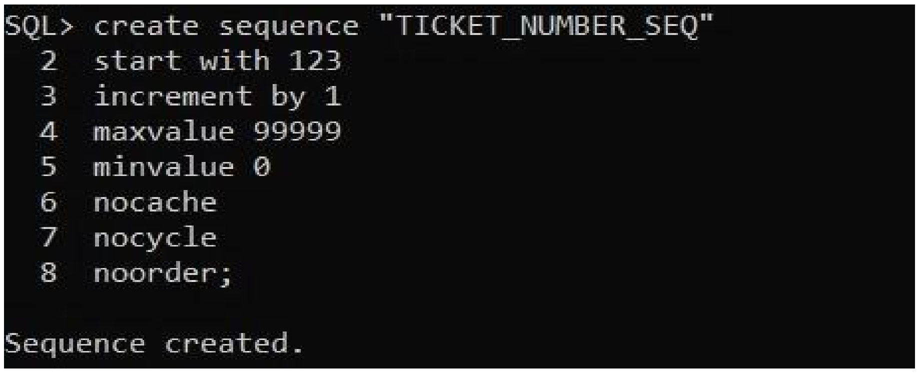
Sequences

EMPLOYEE ID SEQUENCE



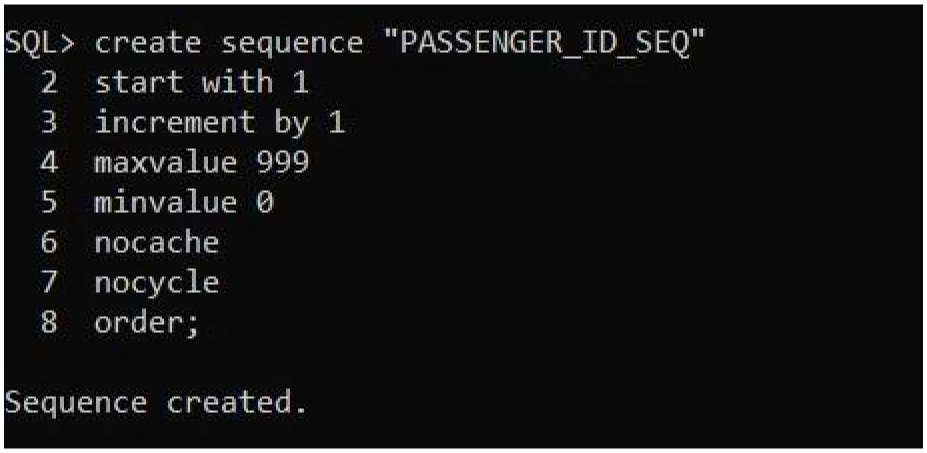
```
SQL> create sequence "EMPLOYEE_ID_SEQ"
     start with 0
     increment by 1
     maxvalue 99999
     minvalue 0
     nocache
     nocycle
     noorder;

Sequence created.
```

TICKET NUMBER SEQUENCE



```
SQL> create sequence "TICKET_NUMBER_SEQ"
     start with 123
     increment by 1
     maxvalue 99999
     minvalue 0
     nocache
     nocycle
     noorder;

Sequence created.
```

PASSENGER ID SEQUENCE



```
SQL> create sequence "PASSENGER_ID_SEQ"
     start with 1
     increment by 1
     maxvalue 999
     minvalue 0
     nocache
     nocycle
     order;

Sequence created.
```

Procedures

NEW_PASSENGER_PRO

```
create or replace procedure "NEW_PASSENGER_PRO"
(passport_number IN VARCHAR2, flight_code IN VARCHAR2,
firstname IN VARCHAR2, lastname IN VARCHAR2,
homeaddress IN VARCHAR2, phonenumber IN NUMBER,
p_gender IN VARCHAR2, p_freqfdiscount IN VARCHAR2,
p_employeediscount IN VARCHAR2, p_employeeid IN VARCHAR2,
p_class IN VARCHAR2, p_seat IN VARCHAR2,
p_price IN NUMBER)
is
BEGIN
INSERT INTO PASSENGER_DATA ("PASSENGER_ID","PASSPORT_NUMBER","FLIGHT_CODE")
VALUES
(PASSENGER_ID_SEQ.nextval, passport_number,flight_code);
COMMIT;
INSERT INTO PASSENGER_DETAILS
("PASSENGER_ID","FNAME","LNAME","HOME_ADDRESS",
"PHONE_NUMBER","GENDER","FREQF_DISCOUNT","EMPLOYEE_DISCOUNT","EMPLOYEE_ID
") VALUES
```

```
(PASSENGER_ID_SEQ.currval, firstname, lastname, homeaddress, phonenumber, P_gender,
p_freqfdiscount, p_employeediscount, p_employeeid);
COMMIT;
INSERT INTO TICKET ("TICKET_NUMBER", "FLIGHT_CODE", "PASSENGER_ID", "SEAT_NUM")
VALUES
(TICKET_NUMBER_SEQ.nextval, flight_code, PASSENGER_ID_SEQ.currval, p_seat);
COMMIT;
INSERT INTO TICKET_DATA
("TICKET_NUMBER","BOOKING_DATE","TRAVEL_DATE","CANCEL_DATE","CLASS","PRICE")
VALUES
(TICKET_NUMBER_SEQ.currval, sysdate, sysdate+7, '', p_class, p_price);
COMMIT;
END;
/
```

```
Procedure created.
```

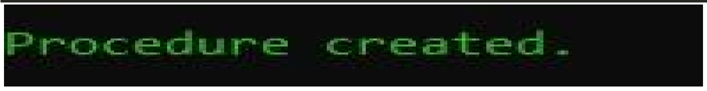
NEW_EMPLOYEE_PRO

```
create or replace procedure "NEW_EMPLOYEE_PRO"
(airport_code IN VARCHAR2,department_id IN NUMBER,
p_fname IN VARCHAR2,p_lname IN VARCHAR2,
p_phone_num IN NUMBER,p_age IN NUMBER,
p_gender IN VARCHAR2,p_home_address IN VARCHAR2)
is
BEGIN
  INSERT INTO EMPLOYEE ("EMPLOYEE_ID","AIRPORT_CODE") VALUES
  (EMPLOYEE_ID_SEQ.nextval, airport_code);
  COMMIT;

  INSERT INTO EMPLOYEE_DETAILS ("EMPLOYEE_ID","DEPARTMENT_ID","FNAME",
    "LNAME","PHONE_NUMBER","AGE","GENDER","HOME_ADDRESS")
  VALUES
  (EMPLOYEE_ID_SEQ.currval,
department_id,p_fname,p_lname,p_phone_num,p_age,p_gender,p_home_address);
  COMMIT;
END;
/;
```

```
Procedure created.
```

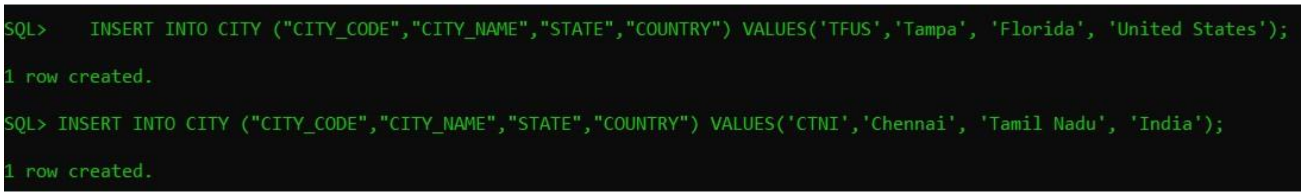
```
create or replace procedure "UPDATE_SEATS_PRO"
(p_flight_code IN VARCHAR2,
p_class IN VARCHAR2,p_seat_num IN VARCHAR2)
is
begin
DECLARE
   T_AVAIL_SEATS number; AVAIL_ECO_SEATS number; AVAIL_BUS_SEATS number;
   AVAIL_FIR_SEATS number;
   FL_CLASS VARCHAR(30);
```

```
BEGIN
   SELECT AVAIL_SEATS INTO T_AVAIL_SEATS FROM CABIN_DATA WHERE
FLIGHT_CODE = p_flight_code;
   SELECT AVAIL_ECONOMY_CLASS INTO AVAIL_ECO_SEATS FROM CABIN_DATA
WHERE FLIGHT_CODE = p_flight_code;
   SELECT AVAIL_BUSINESS_CLASS INTO AVAIL_BUS_SEATS FROM CABIN_DATA
WHERE FLIGHT_CODE = p_flight_code;
   SELECT AVAIL_FIRST_CLASS INTO AVAIL_FIR_SEATS FROM CABIN_DATA WHERE
FLIGHT_CODE = p_flight_code;
   IF T_AVAIL_SEATS > 0 THEN
      dbms_output.put_line('ALL SEATS ARE FULL IN  FLIGHT');
   ELSE
      IF p_class = 'economy' OR p_class = 'ECONOMY' OR p_class = 'ECO' THEN
         FL_CLASS:='AVAIL_ECONOMY_CLASS';
         IF AVAIL_ECO_SEATS <= 0 THEN
            dbms_output.put_line('ALL SEATS ARE FULL IN ECONOMY CLASS');
         ELSE
            UPDATE CABIN_DATA SET AVAIL_SEATS=AVAIL_SEATS-1,
            AVAIL_ECONOMY_CLASS=AVAIL_ECONOMY_CLASS-1
            WHERE FLIGHT_CODE=p_flight_code;
            COMMIT;
          END IF;
      ELSIF p_class = 'BUSINESS' OR p_class = 'business' OR p_class = 'busi' THEN
         FL_CLASS:='AVAIL_BUSINESS_CLASS';
         FL_CLASS:='AVAIL_ECONOMY_CLASS';
         IF AVAIL_ECO_SEATS <= 0 THEN
            dbms_output.put_line('ALL SEATS ARE FULL IN BUSINESS CLASS');
         ELSE
            UPDATE CABIN_DATA SET AVAIL_SEATS=AVAIL_SEATS-1,
            AVAIL_BUSINESS_CLASS=AVAIL_BUSINESS_CLASS-1
            WHERE FLIGHT_CODE=p_flight_code;
            COMMIT;
         END IF;
      ELSE
         FL_CLASS:='AVAIL_FIRST_CLASS';
         IF AVAIL_ECO_SEATS <= 0 THEN
            dbms_output.put_line('ALL SEATS ARE FULL IN BUSINESS CLASS');
         ELSE
            UPDATE CABIN_DATA SET AVAIL_SEATS=AVAIL_SEATS-1,
            AVAIL_FIRST_CLASS=AVAIL_FIRST_CLASS-1
            WHERE FLIGHT_CODE=p_flight_code;
            COMMIT;
          END IF;
      END IF;
   END IF;
END;
END;
```

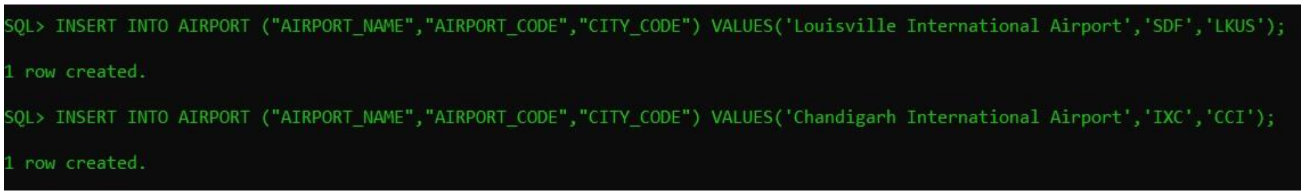


```
Procedure created.
```

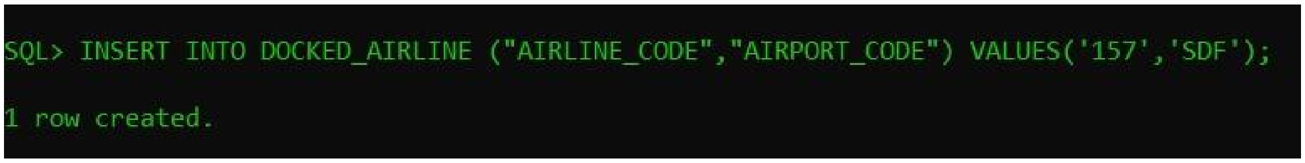
Case Study Interactive Queries



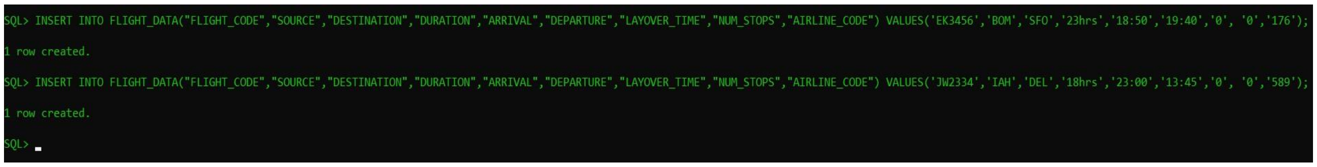
```
SQL>    INSERT INTO CITY ("CITY_CODE","CITY_NAME","STATE","COUNTRY") VALUES('TFUS','Tampa', 'Florida', 'United States');

1 row created.

SQL> INSERT INTO CITY ("CITY_CODE","CITY_NAME","STATE","COUNTRY") VALUES('CTNI','Chennai', 'Tamil Nadu', 'India');

1 row created.
```



```
SQL> INSERT INTO AIRPORT ("AIRPORT_NAME","AIRPORT_CODE","CITY_CODE") VALUES('Louisville International Airport','SDF','LKUS');

1 row created.

SQL> INSERT INTO AIRPORT ("AIRPORT_NAME","AIRPORT_CODE","CITY_CODE") VALUES('Chandigarh International Airport','IXC','CCI');

1 row created.
```

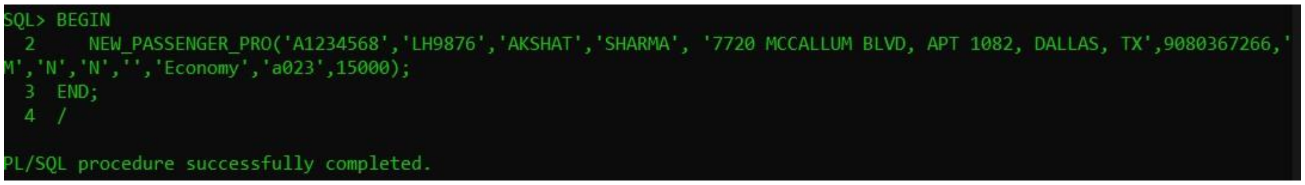


```
SQL> INSERT INTO DOCKED_AIRLINE ("AIRLINE_CODE","AIRPORT_CODE") VALUES('157','SDF');

1 row created.
```



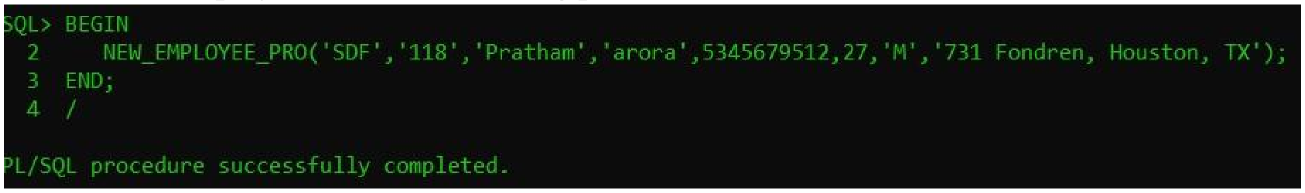
```
SQL> INSERT INTO FLIGHT_DATA("FLIGHT_CODE","SOURCE","DESTINATION","DURATION","ARRIVAL","DEPARTURE","LAYOVER_TIME","NUM_STOPS","AIRLINE_CODE") VALUES('EK3456','BOM','SFO','23hrs','18:50','19:40','0', '0','176');

1 row created.

SQL> INSERT INTO FLIGHT_DATA("FLIGHT_CODE","SOURCE","DESTINATION","DURATION","ARRIVAL","DEPARTURE","LAYOVER_TIME","NUM_STOPS","AIRLINE_CODE") VALUES('JW2334','IAH','DEL','18hrs','23:00','13:45','0', '0','589');

1 row created.

SQL> 
```

Insertion of Passenger Related Data using procedure



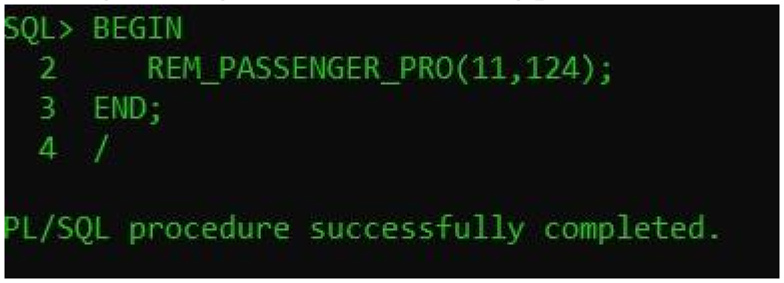
```
SQL> BEGIN
  2     NEW_PASSENGER_PRO('A1234568','LH9876','AKSHAT','SHARMA', '7720 MCCALLUM BLVD, APT 1082, DALLAS, TX',9080367266,'
M','N','N','','Economy','a023',15000);
  3  END;
  4  /

PL/SQL procedure successfully completed.
```

Insertion of Employee Related Data using procedure



```
SQL> BEGIN
  2     NEW_EMPLOYEE_PRO('SDF','118','Pratham','arora',5345679512,27,'M','731 Fondren, Houston, TX');
  3  END;
  4  /

PL/SQL procedure successfully completed.
```

Deleting Passenger Related Data using procedure



```
SQL> BEGIN
  2     REM_PASSENGER_PRO(11,124);
  3  END;
  4  /

PL/SQL procedure successfully completed.
```

Conclusion

While working on this project, we learnt a lot about creating a database and implementing all the queries related to creation of the database, modifying it and fetching the data from it. We have a good hold on the concepts related to ER diagrams and normalization now.
We also learned about procedures, sequences by this project and triggers.

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