Semester A181
Assignment 1 – Capacity Planning

Based on the Pilot database schema as shown in Figure 1, answer the following questions:

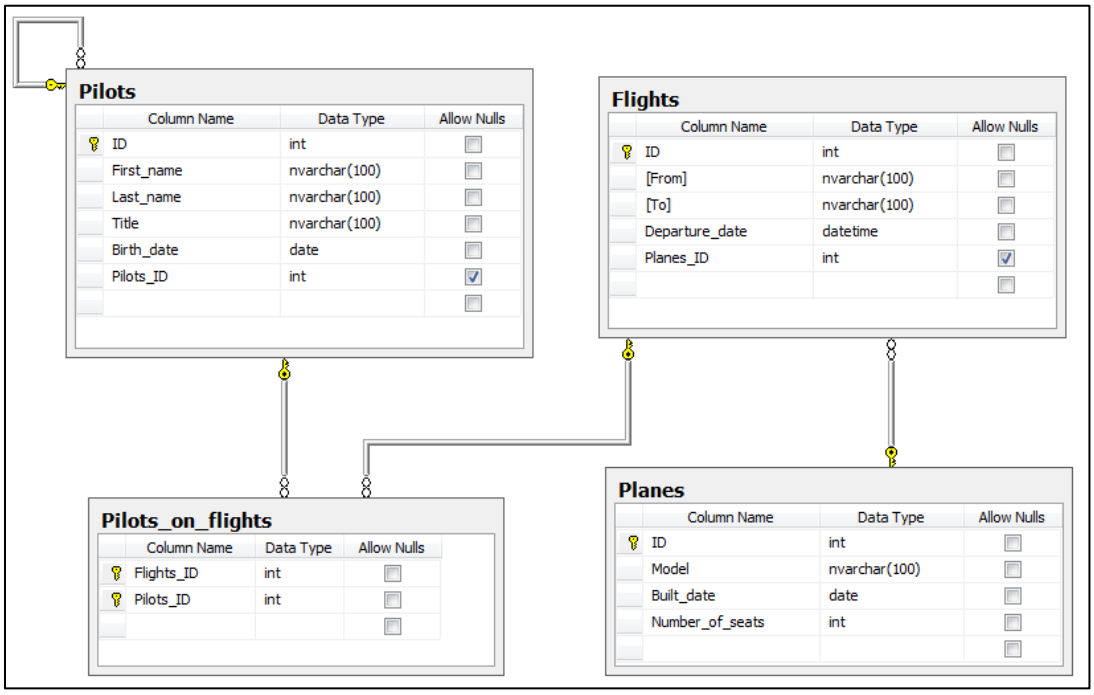

Figure 1: The Database Schemas for Pilot

Question 1:

By using the T-SQL, write commands to create a complete table PILOTS, FLIGHTS, PILOTS_ON_FLIGHTS and PLANES.

(10 Marks)

```
CREATE TABLE PILOTS
(
   ID Int NOT NULL,
   First_Name NVarchar (100) NOT NULL,
   Last_Name NVarchar (100) NOT NULL,
   Title NVarchar (100) NOT NULL,
   Birth_date Date NOT NULL,
   Pilots_ID Int NULL,
   CONSTRAINT PRIMARY KEY (ID)
)
```

```
CREATE TABLE PILOTS_ON_FLIGHTS
(
   Flights_ID Int NOT NULL,
   Pilots_ID Int NOT NULL,
   CONSTRAINT PRIMARY KEY (Flights_ID, Pilots_ID),
   CONSTRAINT PRIMARY KEY (Pilots_ID) REFERENCES PILOTS (Pilots_ID)
)

CREATE TABLE FLIGHTS
(
   ID Int NOT NULL,
   [From] NVarchar (100) NOT NULL,
   [To] NVarchar (100) NOT NULL,
   Departure_date Datetime NOT NULL,
   Plane_ID Int NOT NULL,
   CONSTRAINT PRIMARY KEY (ID),
   CONSTRAINT KEY (Plane_ID) REFERENCES PLANES (ID)
)

CREATE TABLE PLANES
(
   ID Int NOT NULL,
   Model NVarchar (100) NOT NULL,
   Built_date Date NOT NULL,
   Number_of_seats Int NOT NULL,
   CONSTRAINT PRIMARY KEY (ID)
)
```

Question 2:

Calculate the estimate size of all tables for the period of 10 years. Assume the records in table PILOTS will increase 1000 a year, FLIGHTS will increase 1000 a year, PILOTS_ON_FLIGHTS will increase 2000 a year and PLANES will increase 500 a year. Write step by step the calculation and sum up the total size of both tables.

(10 Marks)

TABLES	**CALCULATION**	**ESTIMATION**
PILOTS Estimated for: 1000 x 10 years = 10000 rows	Size -> 4+100+100+100+8+4+2 = 318 bytes/row 8060/318 = 25 rows/page 10000/25 = 400 pages 400/8 = 50 extents 50/16 = **4 MB**	**4 MB**
PILOTS_ON_FLIGHTS Estimate for: 2000 x 10 = 20000	Size -> 4+4+2 = 10 bytes/row 8060/10 = 806 rows/page 20000/806 = 25 pages	**1 MB**

	25/8 = 4 extents 4/16 = **1 MB**	
FLIGHTS Estimated for: 1000 x 10 years = 10000 rows	Size -> 4+100+100+8+4+2 = 218 bytes/row 8060/218 = 37 rows/page 10000/218 = 271 pages 271/8 = 34 extents 34/16 = **3 MB**	**3 MB**
PLANES Estimated for: 500 x 10 years = 5000 rows	Size -> 4+100+8+4+2 = 118 bytes/row 8060/118 = 69 rows/page 5000/69 = 73 pages 73/8 = 10 extents 10/16 = **1 MB**	**1 MB**
TOTAL		**9 MB**