CS3743 Hwk 4 Relational Algebra (20 pts) - due April 2nd at 11:59pm (not accepted late) Darin Soeung iou957

**Flight**(flightId, flightNm, airline, orig, dest, schedDt, depTm, maxSeats, numSeatsSold)

**Customer**(custNr, name, preferAirline, gender, birthDt)

**Reservation**(custNr, flightId, reqSeatQty)

**Customer**

+--------+---------------+---------------+------------+--------+

| custNr | name | preferAirline | birthDt | gender |

+--------+---------------+---------------+------------+--------+

| 111 | Perry Noid | Spirit | 2000-04-01 | M |

| 222 | Melba Toast | American | 1990-09-11 | F |

| 333 | Pete Moss | Clampett | 1992-03-03 | M |

| 444 | Bill Board | American | 1985-04-04 | M |

| 480 | Anita Vacay | Spirit | 1975-06-01 | F |

| 555 | Jerry Tall | PoDunk | 1927-04-15 | M |

| 666 | Tom E Gunn | Clampett | 1976-06-06 | M |

| 777 | Bob Wire | PoDunk | 1973-07-07 | M |

| 888 | Ron DeVoux | American | 1990-08-08 | M |

| 890 | Ann T Freeze | NULL | NULL | F |

| 901 | Peg Board | Delta | 1987-04-04 | F |

| 902 | Al B Tross | American | 1957-07-12 | M |

| 903 | B B Gunn | PoDunk | 1976-09-09 | F |

| 904 | Sally Mander | Delta | 1995-09-04 | F |

| 999 | Marcus Absent | Delta | 1999-09-09 | M |

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**Flight**

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| flightId | flightNm | airline | orig | dest | schedDt | depTm | maxSeats | numSeatsSold |

+----------+----------+----------+------+------+------------+----------+----------+--------------+

| 331 | PD001 | PoDunk | SAT | MCO | 2020-03-03 | 10:00:00 | 30 | 30 |

| 341 | PD001 | PoDunk | SAT | MCO | 2020-03-04 | 10:00:00 | 30 | 30 |

| 411 | AH100 | American | HOU | CDG | 2020-04-01 | 08:00:00 | 130 | 25 |

| 412 | AH200 | American | HOU | FLL | 2020-04-01 | 06:00:00 | 130 | 125 |

| 441 | SH100 | Spirit | IHC | FLL | 2020-04-04 | 07:00:00 | 130 | 5 |

| 442 | SH110 | Spirit | IHC | FLL | 2020-04-04 | 15:00:00 | 130 | 0 |

| 460 | SF200 | Spirit | FLL | IHC | 2020-04-11 | 12:00:00 | 130 | 0 |

| 462 | SF200 | Spirit | FLL | IHC | 2020-04-12 | 12:00:00 | 130 | 50 |

| 510 | AS300 | American | SAT | MCO | 2020-05-10 | 10:30:00 | 130 | 5 |

| 519 | F333 | PoDunk | SAT | MCO | 2020-05-19 | 16:00:00 | 30 | 50 |

| 532 | PD002 | PoDunk | HOU | SEG | 2020-05-03 | 11:00:00 | 30 | 5 |

| 604 | AH200 | American | HOU | FLL | 2020-06-04 | 06:00:00 | 130 | 30 |

| 705 | CL123 | Clampett | SAT | MCO | 2020-07-05 | 04:00:00 | 30 | 0 |

| 706 | PD002 | PoDunk | HOU | SEG | 2020-07-06 | 11:00:00 | 30 | 0 |

| 707 | FXXXX | PoDunk | SAT | HOU | 2020-05-03 | 11:00:00 | 30 | 5 |

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**Reservation**

|  |  |
| --- | --- |
| +--------+----------+------------+  | custNr | flightId | reqSeatQty |  +--------+----------+------------+  | 111 | 341 | 10 |  | 111 | 441 | 2 |  | 111 | 519 | 2 |  | 222 | 331 | 12 |  | 222 | 341 | 11 |  | 222 | 441 | 2 |  | 222 | 705 | 2 |  | 333 | 441 | 2 |  | 444 | 412 | 5 |  | 444 | 441 | 2 |  | 444 | 510 | 5 |  | 444 | 519 | 5 |  | 444 | 532 | 2 |  | 444 | 705 | 2 |  | 444 | 706 | 2 |  | 444 | 707 | 2 |  | 480 | 331 | 2 |  | 480 | 441 | 2 |  | 555 | 341 | 3 |  | 555 | 411 | 30 |  | 555 | 412 | 20 |  | 555 | 510 | 20 |  | 555 | 519 | 1 |  | 555 | 706 | 2 | | | 555 | 707 | 8 |  | 666 | 705 | 3 |  | 777 | 442 | 1 |  | 777 | 460 | 1 |  | 777 | 510 | 1 |  | 888 | 341 | 1 |  | 888 | 519 | 1 |  | 888 | 604 | 1 |  | 890 | 341 | 1 |  | 890 | 510 | 2 |  | 890 | 519 | 1 |  | 890 | 604 | 1 |  | 901 | 341 | 20 |  | 901 | 412 | 8 |  | 901 | 532 | 1 |  | 901 | 706 | 4 |  | 902 | 412 | 5 |  | 903 | 412 | 3 |  | 904 | 412 | 2 |  | 904 | 519 | 5 |  | 999 | 341 | 14 |  | 999 | 412 | 10 |  | 999 | 510 | 15 |  | 999 | 519 | 14 |  | 999 | 532 | 1 |  | 999 | 706 | 5 |  +--------+----------+------------+ |

Show Relational Algegra expressions to solve each of the following:

1. (1 pt) Find the flightId, airline, and departure time for flights departing from SAT for MCO.

**Flight [orig = “SAT”] [dest = ‘MCO’] [flightId, airline, depTm]**

2. (1 pt) Find the flightNm, departure time, and origin for flights on which the customer named Perry Noid has a reservation.

**Customer [name = “Perry Noid”][custNr = custNr]Reservation[flightId = flightId]Flight[flightNm, depTm, orig]**

3. (2 pts) Find the airline of flights departing "SAT" on "2020-03-03" for the customer named "Anita Vacay".

**Customer [name = “Anita Vacay”][custNr = custNr]Reservation[flightId = flightId]Flight[orig=”SAT” ^ schedDt = “2020-03-03”][airline]**

4. (2 pts) Find the customer numbers and names of customers who have a reservation on a flight leaving on April 4th of 2020 on which customer #444 also has a reservation. Do not include #444 in your result. Hint: you will have to use one of the relations twice.

**Reservation[flightId]-(Flight[custNr <> “444”][flightId])[flightId = flightId]**

**Flight[flightId] – (Flight[schedDt <> “2020-4-4”][flightId])[flightId = flightId]**

**Reservation[custNr = custNr]Customer[custNr, name]**

5. (2 pts) Find the customer number of customers who are flying on all of the flights having a destination of "SEG".

**Flight[dest = “SEG”][flightId = flightId]Reservation[custNr]**

6. (3 pts) Find the customer number, name, gender, and birth date of customers who do not have reservations on flights with Spirit airlines.

Hint: we want to subtract customers that are on Spirit flights

**Flight[flightId] – (Flight[airline = “Spirit”][flightId])[flightId=flightId]Reservation[custNr = custNr]**

**Customer[custNr, name, gender, birthDt]**

7. (3 pts) Find the flightNm and scheduled dates for flights on which only customer #777 has a reservation. State whether your answer includes flights that don't have any associated reservations.

**Reservation [custNr] – (Reservation [custNr <> 777][custNr])[flightId = flightId] Flight[flightNm, schedDt]**

8. (3 pts) Find the names of customers who are on all the flights which Ron DeVoux has

reservations. State whether you included Ron DeVoux in your answer.

**Customer[name = “Ron Devoux”][custNr=custNr]Reservation[flightId = flightId]**

**Reservation[custNr = custNr]Customer [name]**

9. (3 pts) Find the customer number, names, and preferred airlines for customers who only have reservations on a flight which Podunk is the airline.

**Flight[flightId] – (Flight[airline <> “Podunk”][flightId])[flightId=flightId]**

**Reservation[custNr = custNr]Customer[custNr, name, preferAirline]**