

CS 445
Fall 2015
Airline Database Schema Lab

The following queries concern the airline database from Exercise 5.3 of the text. As noted in the text, the Employees relation also contains employees that are not necessarily pilots. For those employees that are pilots, they are certified on particular aircraft. There is also information regarding Flights that is contained in a separate relation Flights with no foreign keys to any of the other relations.

The schema is:

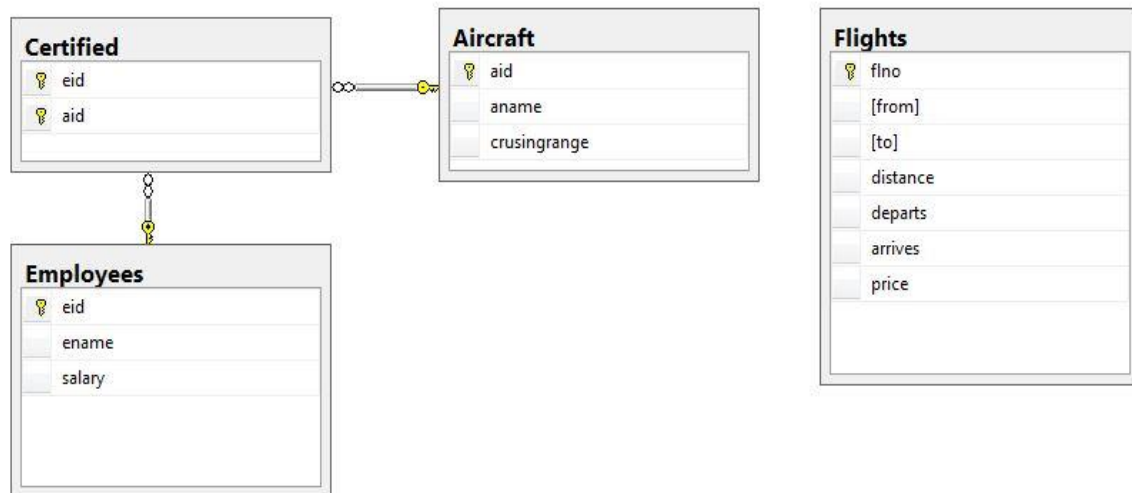
Flights (*fno*: integer, *from*: string, *to*: string, *distance*: integer, *departs*: time, *arrives*: time, *price*: integer)

Aircraft (*aid*: integer, *aname*: string, *cruisingrange*: integer)

Certified (*eid*: integer, *aid*: integer)

Employees (*eid*: integer, *ename*: string, *salary*: integer)

Graphically, showing the foreign keys:



Please execute the following queries against the instance of the Airline database on SQL SERVER 2014.

- 1) For each pilot who is certified for more than three aircraft, find the `eid` and the maximum cruising range of the aircraft for which she or he is certified.
- 2) Find the names of the pilots certified for some Boeing aircraft.
HINT: Use LIKE in your WHERE clause.
- 3) Find the names of the pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu.
HINT: Use a subquery in WHERE clause, will need aggregate operator on price. Also note you will need to reference the [from] and [to] attributes as F.[from] and F.[to].

- 4) Print the names of employees who are certified only on aircrafts with a cruising range longer than 1000 miles.

HINT: According to the SQL Standard, the following is supposed to work:

```
SELECT E.ename
FROM Employees E, Certified C, Aircraft A
WHERE C.aid=A.aid and E.eid=C.eid
GROUP BY E.eid, E.ename
HAVING EVERY (A.cruisingrange>1000)
```

Unfortunately, SQL Server 2014 has no implementation of the EVERY clause. Can you think of a way around this?

- 5) Find the aids of all aircraft that can be used on routes from Los Angeles to Chicago.
HINT: The cruising range needs to be bigger than the smallest flight distance from Los Angeles to Chicago.
- 6) Identify the routes that can be piloted by every pilot who makes more than \$200,000.

HINT: Classic Division question. You need to find all flights (F.[from], F.[to]) such that there does not exist an employee whose salary is greater than \$100,000 such that there does not exist an Aircraft for which they are certified whose cruising range is larger than the flight distance. This needs to be a correlated query, with your first select containing only the Flights relation, the second nested query containing only the Employees relation, with the third nested query containing attributes from both the flights relation and the employees relation.