

CECS 323 HOMEWORK: MANY TO MANY

OBJECTIVE: Learn how to reverse engineer existing data and improve upon the design using many to many relationships.

INTRODUCTION: It is rare these days to receive an assignment to automate a process from scratch. Unless the enterprise is breaking into totally new areas, it is far more likely that there has been **some** sort of automation in place, and now it is time to improve upon that. Part of that improvement process includes converting from the existing data architecture to a new one. In this case, the existing tables look like:

The following tables are part of the database for the USA Travel Agency. The "Airlines" table contains the details of the various airlines that it deals with. The "Flights" table lists the details of flights that these airlines fly on. The details of passengers confirmed are in the Passengers table.

Note: Schedules are like Courses and Flights are like course sections.

Airlines

Airline#	Name
1	Delta
2	United
3	American
4	USAir
5	TWA

Flight Schedules

Flight No.	Airline #	From	To	Departure	Arrival
2345	2	Washington	Columbus	7.40	9.40
6785	4	Pittsburg	Seattle	19.40	23.50
8888.	5	Pittsburg	Seattle	9:25	10:25
6754	3	New York	LA	17:35	20:53
4567	2	Long Beach	San Francisco	8:01	9:02

Flights

Flight No.	Airline	Departure Date	Model	Ticket Price	Available
2345	2	03/27/15	747	\$357	No
6785	4	04/26/15	737	\$489	No
8888	5	05/16/16	737	\$525	Yes
6754	3	04/27/17	747	\$399	Yes

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6754	3	04/20/17	747	\$295	No
2345	2	04/01/17	747	\$400	Yes
4567	2	05/21/17	737	\$123	Yes
4567	2	05/22/17	737	\$99	Yes

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Passengers

Conf. No.	Flight	Airline	Seat No.	Dep. Date	Last Name	First name	Meal Pref	Phone number
245671	2345	2	8	03/27/15	Clinton	Bill	Non-Veg	4444444
456789	6785	4	19	04/26/15	Clinton	Hillary	Veg	8888888
907865	8888	5	32	05/16/16	Coleman	Michael	Non-Veg	7777777
678954	6754	3	44	04/27/17	Blair	Tony	Non-Veg	6666666
678956	6754	3	13	04/27/17	Spears	Brittany	N/A	3843849
948583	8888	5	33	05/16/16	Voinovich	John	Veg	3948322
999222	8888	3	45	05/16/16	Coleman	Michael	Non-Veg	7777777
324442	2345	2	16	04/01/17	Spears	Brittany	N/A	3843849
546790	6754	3	12	04/20/17	Clinton	Hillary	Veg	8888888

The following business rules apply to the above data:

- The airline number, the flight number and the confirmation number are all assigned by the Federal Aviation Administration (FAA). The FAA is an outside organization.
- No two airlines have the same name. No two airlines have the same number.
- Flights are **actual trips** from one place to another on a specified date, carrying passengers. On the other hand, Flight **Schedules** are merely the definition of a flight. That is why we do not carry the model of the aircraft for a Flight Number because that will vary from one **flight** to the next. Another way to think of it is that a Flight is the execution of a Flight **Schedule**.
- The confirmation number is unique across all flights, all airlines.
- No two passengers ever get the same seat number on the same flight, no matter how much they might like each other.
- The model column for Flights is the model aircraft. These all happen to be Boeing models, but A320, for instance could go in there just as easily. They are not surrogate ids for the flight.
- Generally, the Passenger's phone number and meal preference will not change from one ticket to the next. Think about how you might reduce redundancy in the model.

PROCEDURE: Come up with a database design that will accommodate the above datasets.

WHAT TO TURN IN:

- The UML class diagram
- Definitions for your classes
- Descriptions of the associations

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- Relation scheme diagram
 - Be sure to identify the primary key for each relation in the diagram
 - Be sure to identify any other candidate keys that you see