

CS 386: Quiz 8, 6 June 2006Name: _____ **KEY** _____

No books or notes. You can talk to anyone you want in the classroom.

Consider the following relation with airline schedule information. (NUM-BUS and NUM-COACH are the numbers of business and coach seats on the aircraft.)

FLIGHT	FROM	TO	DEPART	ARRIVE	AIRCRAFT	NUM-BUS	NUM-COACH
57	PDX	SEA	8:08a	9:20a	737	16	115
61	PDX	SEA	12:35p	1:45p	737	16	115
198	PDX	SEA	4:30p	5:30p	757	14	180
58	SEA	PDX	10:15a	11:25a	737	16	115
63	SEA	PDX	2:40p	3:45p	737	16	115
16	PDX	LAX	10:10a	12:55p	767	22	210
21	PDX	LAX	6:50p	9:20p	767	22	210
17	LAX	PDX	2:20p	4:55p	757	14	180
22	LAX	PDX	10:30p	12:55a	757	14	180
104	LAX	SEA	6:50p	10:15p	DC10	16	210
192	PDX	LAX	8:15a	11:25a	767	22	210

Question 1 (6 points): Which of the following functional dependencies hold in this instance?

FLIGHT \rightarrow FROM TO *HOLDS: FLIGHT is key for this instance, hence determines everything*
 AIRCRAFT \rightarrow NUM-BUS *HOLDS: Tuples with the same AIRCRAFT have the same NUM-BUS*
 NUM-BUS \rightarrow NUM-COACH *FAILS: See flights 63 and 104*
 DEPART \rightarrow FROM *FAILS: See flights 21 and 104*
 FROM TO \rightarrow AIRCRAFT *FAILS: See flights 61 and 198*
 FROM TO DEPART \rightarrow ARRIVE *HOLDS: FROM TO DEPART are unique across tuples*

Question 2 (2 points): Of the functional dependencies (from Question 1) that hold in this instance, identify the one that you think is least likely to hold in general, and say why you think so.

Note: If you incorrectly identified an FD as holding in Question 1, and used that as your choice here, I didn't take off any points.

My choice was AIRCRAFT \rightarrow NUM-BUS, since different planes of the same type could be configured differently. (For example, planes on shorter routes often have fewer business seats.) A common answer was FROM TO DEPART \rightarrow ARRIVE, with the reason being that different types of aircraft leaving at the same time may take more or less time to make the same trip.

Question 3 (2 points): Find another functional dependency that holds for this instance. (It should be non-trivial.)

Lots of choices: FLIGHT \rightarrow DEPART, AIRCRAFT \rightarrow NUM-COACH, NUM-BUS NUM-COACH \rightarrow AIRCRAFT, DEPART \rightarrow NUM-COACH