

CS180 Database Systems - Spring 2004

Homework 6

Due in class on June 3rd, 2004

Instructions: Answer all questions *concisely*. Write your name on every answer sheet.

- Given the relation schema $R(A,B,C,D,E)$ and a set of functional dependencies $F = \{AB \rightarrow CD, C \rightarrow A, D \rightarrow E\}$
 - (1 pt.) Give a smallest instance of R that satisfies F .
 - (1 pt.) Give a smallest instance of R that does not satisfy F .
 - (2 pts.) Find the candidate keys of this relation.
 - (2 pts.) Is R in third normal form? Justify your answer.
- Given the relationl schema $\text{Flight}(\text{from}, \text{to}, \text{airline})$,
 - (2 pts.) write a datalog program to compute all triples (s, d, a) which denotes that airline “a” flies from source “s” to destination “d”. (Note that there may be zero or more intermediate stops between “s” and “d”.)
 - (2 pts.) write an SQL query that computes the above problem.
- (5 pts.) Fill in the missing values in the following relation to make the following functional dependencies hold. Nulls are not allowed.

$$F = \{B \rightarrow C, E \rightarrow DF, A \rightarrow D, C \rightarrow F\}$$

A	B	C	D	E	F	G
1		3				3
1	2	3	4	5	6	3
	2			5		
4	3	4	2	8	1	