DataBases

TUTORIAL 5 : Functional dependencies

Exercise 1

Consider the following Supplier relationship:

NUMSUPP	CITY	NUMPROD	QTY
F1	ALGER	P1	100
F1	ALGER	P2	100
F2	ORAN	P1	200
F2	ORAN	P2	200
F3	ORAN	P2	300
F4	ALGER	P2	400
F4	ALGER	P4	400
F4	ALGER	P5	400

- Which DFs are satisfied by Supplier tuples?
- Can we be sure that Supplier satisfies these DFs?
- What functional dependencies are not satisfied by Supplier tuples?
- Can we be sure that Supplier does not satisfy these DFs?

Exercise 2

Let the relation R(A,B,C,D,E,G,H) be the set of DFs:

F = {AB→C, B→D, CD→E, CE→GH, G→A}.

- Are the following DFs correct : **AB → E** ? **BG → C** ? **AB → G** ? Justify your answers.
- What are the candidate keys of F?

Exercise 3

Let the relation R(A,B,C,E,H) and let F and G be two sets of DFs:

F {A→B, CE→H, C→E, A→CH} and G = {C→EH, A→BC}

- Are the two sets of DFs F and G equivalent?
- What are the candidate keys of R?

Exercise 4

Consider the relation R(A, B, C, D, E, F) and its set of DFs:

$$\begin{cases} AB \rightarrow C \quad C \rightarrow A \quad BC \rightarrow D \quad ACD \rightarrow B \quad BE \rightarrow C \\ CE \rightarrow BD \quad CE \rightarrow FA \quad D \rightarrow EF \end{cases}$$

Find an irreducible (minimal) cover of this set of DFs.