

Functional Dependency

Exercise 1: Consider a relation $R(A, B, C, D, E)$ with the following dependencies:

$$AB \rightarrow C, CD \rightarrow E, DE \rightarrow B$$

Find all possible keys of the relation.

Exercise 2: Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies:

$$A, B \rightarrow C$$

$$A \rightarrow D, E$$

$$B \rightarrow F$$

$$F \rightarrow G, H$$

$$D \rightarrow I, J$$

What is the key for R ? Decompose R into 2NF, then 3NF relations.

Exercise 3: Consider the universal relation $R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of functional dependencies:

$$A, B \rightarrow C$$

$$B, D \rightarrow E, F$$

$$A, D \rightarrow G, H$$

$$A \rightarrow I$$

$$H \rightarrow J$$

What is the key for R ? Decompose R into 2NF, then 3NF relations.

Exercise 4: Consider the relation $R = \{ShipName, ShipType, VoyageID, Cargo, Port, Date\}$ and the set of functional dependencies:

$$ShipName \rightarrow ShipType$$

$$VoyageID \rightarrow ShipName, Cargo$$

$$ShipName, Date \rightarrow VoyageID, Port$$

What is the key for R ? Decompose R into 2NF, then 3NF relations.