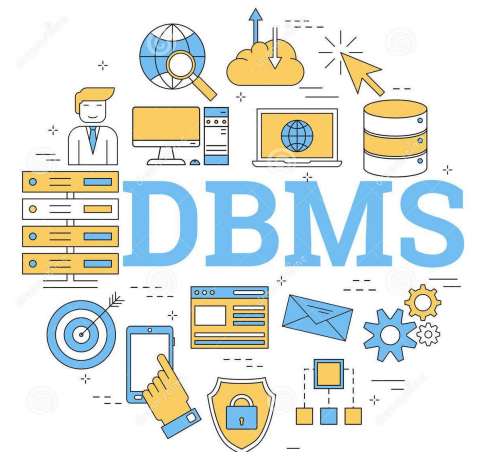


Unit III – Database Design

Dependencies and Normal forms - Functional Dependencies, Armstrong's axioms for FD's, closure of a set of FD's, **minimal covers - Non- loss decomposition** -First, Second, Third Normal Forms, Dependency Preservation-Boyce/Codd Normal Form- Multivalued Dependencies and Fourth Normal Form- Join Dependencies and Fifth Normal Form





Minimal covers or Canonical Cover of Functional Dependencies

- Canonical cover is called minimal cover which is called the minimum set of FDs.

F = Functional Dependencies
F' = Canonical Cover

If F' don't have

- Extraneous Attribute / Redundant Attribute
- Redundant FD's

Minimal covers or Canonical Cover of Functional Dependencies

Steps

1. Splitting Rule – so that in every FD's right hand side has single Attribute
2. Remove Extraneous Attribute / Redundant Attribute
3. Remove Redundant FD's

Example 1

- Consider an example $\{AB \rightarrow C, C \rightarrow AB, B \rightarrow C, ABC \rightarrow AC, A \rightarrow C, AC \rightarrow B\}$ to find canonical cover of F.

1. Splitting Rule – so that in every FD's right hand side has single Attribute

$$F = \{ \cancel{AB} \rightarrow C, C \rightarrow A, C \rightarrow B, B \rightarrow C, \cancel{ABC} \rightarrow A, \cancel{ABC} \rightarrow C, A \rightarrow C, \cancel{AC} \rightarrow B \}$$

Trivial Dependency

2. Remove Extraneous Attribute / Redundant Attribute

$$F = \{ \cancel{B} \rightarrow C, C \rightarrow A, \cancel{C} \rightarrow B, B \rightarrow C, \cancel{A} \rightarrow C, A \rightarrow B \}$$

3. Remove Redundant FD's

$$F = \{ C \rightarrow A, B \rightarrow C, A \rightarrow B \}$$

$$C^+ \rightarrow CB$$

$$C^+ \rightarrow CAB$$

$$B^+ \rightarrow B$$

$$A^+ \rightarrow ACB$$

$$A^+ \rightarrow A$$

Home Work

Consider an following example to find canonical cover of F.

1. $\{ A \rightarrow BC, B \rightarrow C, A \rightarrow B, AB \rightarrow C \}$
2. $\{ A \rightarrow C, AB \rightarrow C, C \rightarrow DI, CD \rightarrow I, EC \rightarrow AB, EI \rightarrow C \}$



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Thank You!