

## BCNF Examples

### Condition:

- 1) It is in 3NF
- 2) For each Non trivial FD  $X \twoheadrightarrow Y$ , X must be a Super key.

### Example 1:

R ( A, B, C) and FD = {A  $\twoheadrightarrow$  B, B  $\twoheadrightarrow$  C, C  $\twoheadrightarrow$  D, D  $\twoheadrightarrow$  A}

Is relation R in BCNF?

### Answer:

CK are A, B and C

The relation is in 2NF as well as in 3NF

For BCNF, LHS of all FD are Super keys.

Hence it is in BCNF

### Example 2:

R(A,B,C,D,E) and FD = { A  $\twoheadrightarrow$  BCDE , BC  $\twoheadrightarrow$  ACE , D  $\twoheadrightarrow$  E}

What is the highest Normal Form?

### Answer:

CK are A and BC

Prime Attribute : A, B, C                      Non prime attribute : D and E

Check for BCNF, A  $\twoheadrightarrow$  BCDE , BC  $\twoheadrightarrow$  ACE are satisfying BCNF condition but D  $\twoheadrightarrow$  E is not satisfying. Hence it is not in BCNF.

Check for 3NF, D  $\twoheadrightarrow$  E is violating the condition hence it is not 3NF.

Check for 2NF, No partial dependencies, Hence it is in 2NF.

### Example 3:

R(A,B,C,D,E) and FD = { AB  $\twoheadrightarrow$  CDE , D  $\twoheadrightarrow$  A}

What is the highest Normal Form?

### Answer:

CK are AB and BD

Prime Attribute : A, B, D                      Non prime attribute : E

Check for BCNF, D  $\twoheadrightarrow$  A is violating the candidate key, hence it is not in BCNF.

Check for 3NF, Non prime  $\twoheadrightarrow$  non prime are not there, Hence it is in 3NF.