



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Experiment 4

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1. Consider a relation R having attributes as R(ABCD), functional dependencies are given below:

AB→C, C→D, D→A

Identify the set of candidate keys possible in relation R. List all the set of prime and non-prime attributes.

Ans: Closure Property: -

$AB^+ = \{A, B, C, D\}$

$BC^+ = \{B, C, D, A\}$

$AC^+ = \{A, C, D\}$

$BD^+ = \{B, D, C, A\}$

Thus, Candidate Keys = {AC, BC, BD}

Prime Attributes = {A, B, C, D}

Non-Prime Attributes = {Phi}

Thus, it is in 3NF.

2. Relation R(ABCDE) having functional dependencies as:

A→D, B→A, BC→D, AC→BE

Identify the set of candidate keys possible in relation R. List all the set of prime and non-prime attributes.

Ans: Closure Property: -

$AC^+ = \{A, C, B, E, D\}$

$AB^+ = \{A, B, D\}$

$BC^+ = \{B, C, D, A, E\}$

Thus, Candidate Keys = {AC, BC}

Prime Attributes = {A, C, B}

Non-Prime Attributes = {D, E}

Thus, it is in 1NF.

3. Consider a relation R having attributes as R(ABCDE), functional dependencies are given below:

B→A, A→C, BC→D, AC→BE

Identify the set of candidate keys possible in relation R. List all the set of prime and non-prime attributes.

Ans: Closure Property: -

$B^+ = \{B, A, C, E, D\}$

$A^+ = \{A, C, B, E, D\}$

Thus, Candidate Keys = {A, B}

Prime Attributes = {A, B}

Non-Prime Attributes = {C, D, E}

Thus, it is a BCNF.

4. Consider a relation R having attributes as R(ABCDEF), functional dependencies are given below:

A→BCD, BC→DE, B→D, D→A

Identify the set of candidate keys possible in relation R. List all the set of prime and non-prime attributes.

Ans: Closure Property: -

$A^+ = \{A, B, C, D, E\}$

$B^+ = \{B, C, D, E, A\}$

$D^+ = \{D, A, B, C, E\}$

Thus, Candidate Keys = {A, B, D}

Prime Attributes = {A, B, D}

Non-Prime Attributes = {C, E}

Thus, it is BCNF.