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}

Candidate Keys = {AC, BC, BD}
Prime Attributes = {A, B, C, D}
Non-Prime Attributes = {}(none)

Hence, the relation 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}

Candidate Keys = {AC, BC}
Prime Attributes = {A, C, B}

Non-Prime Attributes = {D, E}

Hence, the relation 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}

Candidate Keys = {A, B}

Prime Attributes = {A, B}

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

Hence, the relation is in 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}

Candidate Keys = {A, B, D}

Prime Attributes = {A, B, D}

Non-Prime Attributes = {C, E}

Hence, the relation is in BCNF.