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 = [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]

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]

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]

Candidate Keys = [A, B, D]
Prime Attributes = [A, B, D]
Non-Prime Attributes = [C, E]

Thus, it is BCNF.