**Presentation-3**

Chapter 4 Theory

1. Why do we need Relational Data Theory ?
2. What is Data Redundancy, Update Anomalies?
3. How many kinds of Update Anomalies and what are the disadvantages of Update Anomalies?
4. Explain the concept and Main characteristics of Functional Dependency.
5. What rules are included in Armstrong’s axioms?
6. Explain the following concepts

* Splitting rule
* Closure of functional dependencies
* Equivalent set of Functional Dependency
* Canonical Cover

1. Explain the Algorithm of Checking Lossless-Join using the following example.

U={SNO,CNO,GRADE,TNAME,TAGE,OFFICE}  
 F={(SNO,CNO)→GRADE,CNO→TNAME,

TNAME→(TAGE,OFFICE)}

There are two decompositions as follows.

ρ1={SC, CT, TO}, ρ2={SC, GTO}  
where SC={SNO,CNO,GRADE}, CT={CNO,TNAME},

TO={TNAME,TAGE,OFFICE}, GTO={GRADE,TNAME,TAGE,OFFICE}

Check if ρ1,ρ2 keep Lossless-Join property.

1. The following relation schema R, functional dependency set F and decomposition set ρ are given.

R(S,A,I,P), F={S→A,SI→P}, ρ={R1(SA), R2(SIP)},

Please check if ρ keeps Lossless-join property

1. Given the following relation schema R, where U={A，B，C，D, E, G},

F={AB→C, C→A, BC→D, ACD→B, D→EG, BE→C, CG→BD, CE→AG}, Please calculate the Canonical Cover of F.

1. Please tell the level of the highest normal form, then decompose it to BCNF if it is not in BCNF.
2. R={SNO,SNAME,PNO,QTY}   
   F={SNO→SNAME，SNAME→SNO，(SNO,PNO)→QTY, (SNAME,PNO)→QTY}

* 1. SP={ SNO,SNAME,CITY,STATUS },

F={ SNO→SNAME,SNO→CITY, CITY→STATUS }

1. R(A,B,C,D)，F={A→B,C→D}, R∈2NF？

ρ={R1(AB)，R2(CD)} ,

is ρ with Dependency Preservation and Lossless-join properties?

1. Given R(A,B,C,D)，F={D→B,C→A,A→C},please give the candidate keys, and determine whether R is in 2NF，if not, decompose R into 2NF.