**Practice Drill – Normalization**

1. **Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, M} and the set of functional dependencies {{E, F} 🡪 {G}, {F} 🡪 {I, J}, {E, H} 🡪 {K, L}, K 🡪 {M}, L 🡪 {N} on R. What is the key for R?**
2. FD set for relation STUDENT is:

{STUD\_NO 🡪 STUD\_NAME, STUD\_NO 🡪 STUD\_PHONE,

STUD\_NO 🡪 STUD\_STATE, STUD\_NO 🡪 STUD\_COUNTRY,

STUD\_NO 🡪 STUD\_AGE, STUD\_STATE 🡪 STUD\_COUNTRY }

Find the candidate key.

1. The EMPLOYEE relation has following FD set.

**{E-ID 🡪 E-NAME, E-ID 🡪 E-CITY,**

**E-ID 🡪 E-STATE, E-CITY 🡪 E-STATE}**

Find the candidate key.

1. Consider two set of FD’s, F and G:

F = {{A}→{B}, {B}→{C}, {A,C}→{D}}

G = { {A}→{B}, {B}→{C}, {A}→{D} }

Are F and G equivalent?

1. Compute the canonical cover:

R = (A, B, C) F = {A → BC, B → C, A → B , AB → C}

1. Find whether the following decomposition is dependency preserved or not?

R ( A, B, C, D, E, F, G)

F = { AB 🡪 C, BC 🡪 A, AC 🡪 B, B 🡪 D, E 🡪 FG}

D = { ABC, BD, EFG }

1. Consider the following relational schema:

Suppliers(sid:integer, sname:string, city:string, street:string)

Parts(pid:integer, pname:string, color:string)

Catalog(sid:integer, pid:integer, cost:real)

Assume that, in the suppliers relation above, each supplier and each street within a city has a unique name and (sname, city) forms a candidate key. No other functional dependencies are implied other than those implied by primary and candidate keys. Compute the relation is in which normal form.

1. Find the highest normal form of the following relational schema:
2. R ( A, B, C)

F = { AB 🡪 C, C 🡪 A}

1. R ( A, B, C, D, E)

F = { AB 🡪 CE, E 🡪 AB, C 🡪 D}

1. R ( F1, F2, F3, F4, F5)

F = { F1 🡪 F3, F2 🡪 F4, (F1,F2) 🡪 F5}

1. R (A, B, C, D, E, P, G)

F = { AB 🡪 CD, DE 🡪 P, C 🡪 E, P 🡪 C, B 🡪 G}

1. R ( A, B, C, D, E)

F = { AB 🡪 DE, C 🡪 E, D 🡪 C, E 🡪 A}