Normalization questions

1. Find the canonical cover:

B🡪E

C🡪F

E🡪D

DF🡪A

The original keys: B, C

R1(B, F)

R2(C, F)

R3(E, D)

R4(D, F, A)

R5(B, C) – add the original key

R1, R2, R3, R4, and R5 are in 3NF and in BCNF.

2. Find the canonical cover:

A🡪B

B🡪D

B🡪C

The original key: A

Using B🡪D to decompose R, we get:

R1(A,B,C) in 1NF

R2(B,D) is already in BCNF

Using B🡪C to decompose R1, we get:

R11(A,B) in BCNF

R12(B,C) is already in BCNF

Group the relations with the same key:

R1(B,C,D)

R2(A,B)

R1, R2 are in BCNF form.

3.

R(patient\_id, dob, name, ssn, prescription\_id, prescription\_date, doctor\_id, medication\_price, address, city, state, phone\_no, pharmacy\_address)

R1 includes FD1, FD2

R2 includes FD3

R3 includes FD4

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Patient\_id | dob | name | ssn | prescription\_id | prescription\_date | doctor\_id | medication\_price | address | city | state | phone\_no | pharmacy\_address |
| R1 | K | K | K | K | K | K | K | K | U 🡪K | U  🡪K | U 🡪K | U  🡪K | U  🡪K |
| R2 | U | U | U | U | U | U | K | U | K | K | K | K | U |
| R3 | K | U  🡪K | U  🡪K | U  🡪K | K | U  🡪K | U  🡪K | U  🡪K | U | U | U | U | K |

We have a row with all known values, so the decomposition is lossless. All the FDs have been reserved. So the decomposition is good.

ER questions

2. PATIENT(ssn, firstname, lastname, address, dob, PCP\_liscence\_number, PCP\_liscence\_state)

DOCTOR(liscence\_num, Liscence\_state, firstname, lastname, specialty, years\_of\_experience)

PHARMASUTICAL(PCM\_registration\_id, name, phone\_num)

PHARMACY(name, pharmacy license ID, address)

MEDICATION (barcode number, name, formula, pharmaceutical manufacturer PCM registration ID)