

Quiz 5 Solution

Quiz 5 Solution

Minimal Cover Step 1 and 2

Let $R = \{A, B, C, D, E, F, G\}$
Let the FD set be
 $AB \rightarrow CE$
 $A \rightarrow DF$
 $CE \rightarrow DF$
 $F \rightarrow G$

After step 1

$AB \rightarrow C$
 $AB \rightarrow E$
 $A \rightarrow D$
 $A \rightarrow F$
 $CE \rightarrow D$
 $CE \rightarrow F$
 $F \rightarrow G$

$A^+ = ADFG$
 $B^+ = B$
 $C^+ = C$
 $E^+ = E$

After step 2

$AB \rightarrow C$
 $AB \rightarrow E$
 $A \rightarrow D$
 $A \rightarrow F$
 $CE \rightarrow D$
 $CE \rightarrow F$
 $F \rightarrow G$

Quiz 5 Solution

Minimal Cover Step 3 and 4

AB \rightarrow C
AB \rightarrow E
A \rightarrow D
A \rightarrow F
CE \rightarrow D
CE \rightarrow F
F \rightarrow G

AB+ = ABDEFG
AB+ = ABCDFG
A+ = AFG
A+ = AD
CE+ = CEFG
CE+ = CED
F+ = F

without AB \rightarrow C
without AB \rightarrow E
without A \rightarrow D
without A \rightarrow F
without CE \rightarrow D
without CE \rightarrow F
without F \rightarrow G

After step 3

AB \rightarrow C
AB \rightarrow E
A \rightarrow D
A \rightarrow F
CE \rightarrow D
CE \rightarrow F
F \rightarrow G

After step 4

AB \rightarrow CE
A \rightarrow DF
CE \rightarrow DF
F \rightarrow G

Quiz 5 Solution

3NF Synthesis step 2 and 3

Minimal Cover

AB \rightarrow CE

A \rightarrow DF

CE \rightarrow DF

F \rightarrow G

After step 2

R1 = {A, B, C, E}

R2 = {A, D, F}

R3 = {C, E, D, F}

R4 = {F, G}

ABCE⁺ = ABCEDFG

After step 3

R1 = {A, B, C, E}

R2 = {A, D, F}

R3 = {C, E, D, F}

R4 = {F, G}

Optional Question: Write a trigger called checkStaff. The trigger is called when the mid column in the Staff table is changed. The trigger checks that the new manager (mid) works in the same library as the staff member(s) he/she manages. That is in the new row or rows the library of the mid (also a staff member) must be the same as the library of the sid. If the update is consistent (i.e. the library of the sid and mid are the same) the update succeeds otherwise it fails.

```
create or replace function checkStaff() returns trigger AS $$
```

```
Declare
```

```
    sidLib Integer;
```

```
    midLib Integer;
```

```
Begin
```

```
    select libnum into sidLib from staff where sid = NEW.sid;
```

```
    select libnum into midLib from staff where sid = NEW.mid;
```

```
    if sidLib != midLib then
```

```
        raise exception '% and % do not work in the same library', NEW.sid, NEW.mid;
```

```
    end if;
```

```
    return NEW;
```

```
End;
```

```
$$ Language plpgsql;
```

```
create or replace trigger checkStaff before update of mid on Staff
```

```
For each row execute procedure checkStaff();
```