

CSC343 Prep10

Haider Sajjad

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1. a) $B \rightarrow EF, F \rightarrow D$

b)

A	B	C	D	E	F
3	1	1	2	1	2
4	2	3	<u>2</u>	3	<u>2</u>

The redundancy occurs on the second line where we have $F(2) \rightarrow D(2)$ occurring twice.

c) $R1(BEF), R2(ABCD)$

d) $R2$'s FDs:

$A^+ = ABCDEF : A \rightarrow BCD$

$B^+ = BEFD : B \rightarrow D$

$CD^+ = ABCDEF : CD \rightarrow ABD$

$R1$'s FDs: $B \rightarrow EF$

e) Both are in BCNF, there does not exist a FD in either relation that violates that relation.

2. a) CB is the only key.

b) I know that nothing else is a key because the closure of any combination of attributes without C or B cannot contain every attribute. So it won't be a key.

c) Final schema: $R1(ADE), R2(ABC)$

Start by creating a relation for the union of every FD: $R1(ADE), R2(AC), R3(AE)$

Since there must exist a relation which includes the superkey, create $R4(ABC)$.

So relation is: $R1(ADE), R2(AC), R3(AE), R4(ABC)$

Now, attributes of $R2$ are in $R4$ and attributes of $R3$ are in $R1$, so we don't need them. Leaving us with:

$R1(ADE), R2(ABC)$