

Hem Patel

1) $R = ABCDEGHK$ $F = \{ \underline{ABK} \rightarrow C, A \rightarrow DG, B \rightarrow K, K \rightarrow ADH, H \rightarrow GE \}$

A not in in BCNF K and H

Candidate Key NOT candidate Key

NO not in BCNF form

2) $R = (ABCDEF G)$ $F = \{ A \rightarrow C, A \rightarrow D, B \rightarrow F, E \rightarrow F, F \rightarrow G \}$

a) $R = ABCDEF G$

$R_1 = ACD$ $R_2 = R - R_1 = AB EFG$	$R_{21} = BFG$ $R_{23} = ABE$
$R_1 = ACD$ $A \rightarrow CD \dots$ BCNF	$R_{21} = BFG$ $B \rightarrow FG \dots$ BCNF
$R_2 = AB EFG$ $B \rightarrow FG$	$* ABE$ in BCNF

b) Candidate Key: Key(s) that uniquely identify rows in a table

↳ ABE

Closure (ABE)

$A \rightarrow A, C, D$
 $B \rightarrow B, F$
 $E \rightarrow E, F$
 $F \rightarrow G$

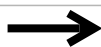
$R_1 = \{ \underline{A} \rightarrow C, A \rightarrow D, E \rightarrow F \}$

$R_2 = \{ \underline{B} \rightarrow F, F \rightarrow G, E \rightarrow F \}$

$R_3 = \{ \underline{E} \rightarrow F \}$

3) $R = ABCDE G$ $F = \{ AB \rightarrow D, AB \rightarrow C, AC \rightarrow E, B \rightarrow D, BE \rightarrow A, E \rightarrow G \}$ $R_1 = \{ ABD \}$, $R_2 = \{ ACE \}$, $R_3 = \{ ADE G \}$

A	B	C	D	E	G
A	B	c1	D	e1	g1
A	b2	C	d2	E	g2
A	b3	c3	D	E	G



A	B	C	D	E	G
A	B	c1	D	e1	g1
A	b2	C	d2	E	G
A	b3	c3	D	E	G

LOSSY - no relations have proper attributes of R

4) $R = ABCD$ $F = \{ A \rightarrow B, C \rightarrow D, BC \rightarrow A \}$ $R_1 = \{ AB \}$, $R_2 = \{ AC \}$, $R_3 = \{ BCD \}$

A	B	C	D
A	B	c1	d1
A	b2	C	d2
a3	B	C	D



A	B	C	D
A	B	c1	d1
A	B	C	d2
a3	B	C	D



A	B	C	D
A	B	c1	d1
A	B	C	D
a3	B	C	D



A	B	C	D
A	B	c1	d1
A	B	C	D
A	B	C	D

show as R
 Lossless

5) Let $R(ABCDE)$ $F = \{AB \rightarrow E, C \rightarrow D, D \rightarrow E, FG \rightarrow A\}$

$R_1 = AB$ $R_2 = BCE$ $R_3 = EDA$ R is not in BCNF

$A \rightarrow B$ $BC \rightarrow E$ $ED \rightarrow A$ the 3 FDs violate the BCNF rule; A, BC, ED don't contain key

6) $R(ABCDEGH)$ $F = \{AB \rightarrow E, C \rightarrow D, D \rightarrow E, FG \rightarrow A\}$

$R_1 = ABE$ $R_2 = CD$ $R_3 = FG \rightarrow A$ $R_4 = (BCFGH)$

If in BCNF

A B C D E F G H

A B c d E f g h

A b c d e F G h

a b C D e f g h

a B C d e F G H

$R_1 = ABE$

A B C D E F G H

A B c d E f g h

A b c d e F G h

a b C D e f g h

A B C D E F G H

$R_2 = CD$

A B C D E F G H

A B c d E f g h

A b c d e F G h

a b C D e f g h

A B C D e F G H

$R_3 = FG \rightarrow A$

A B C D E F G H

A B c d E f g h

A b c d e F G h

a b C D e f g h

A B C d e F G H

$R_4 = BCFGH$

A B C D E F G H

A B c d E f g h

A b c d e F G h

a b C D e f g h

A B C D E F G H

lossless