



- No data is given, the table is assumed to be in 1NF.

- As Candidate key is given, we are taking Property-id as CK because CK is always minimal; but according to FD2 the CK will also contain Country-name and lot# as CK.

FD: { $A \rightarrow B, C, D, E, F,$
 $BC \rightarrow A, D, E,$
 $B \rightarrow F,$
 $D \rightarrow E$ }

2NF

CK: { A, BC }
 PA: { A, B, C }
 NPA: { D, E, F }

	PS of CK		NPA	
	LHS	&	RHS	Result
$A \rightarrow B, C, D, E, F$				
$A \rightarrow B$	F	&	F	F
$A \rightarrow C$	F	&	F	F
$A \rightarrow D$	F	&	T	F
$A \rightarrow E$	F	&	T	F
$A \rightarrow F$	F	&	T	F
$BC \rightarrow A$	F	&	F	F
$BC \rightarrow D$	F	&	T	F
$BC \rightarrow F$	F	&	T	F
$B \rightarrow F$	T	&	T	T
$D \rightarrow E$	F	&	T	F

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

$B \rightarrow F$

$R1(\underline{A}BCDE)$

$B^+ = BF$
 $R2(\underline{B}F)$

3NF

~~$A \rightarrow B, C, D, E, F$~~
 ~~$BC \rightarrow A, D, F$~~
 ~~$D \rightarrow E$~~

Test: LHS (CK/SK) OR RHS (PA)

$$BC^+ = ABCDE \quad PA = \{A\}$$

$$CR = \{A\}$$

$$SK = \{BC\}$$

	Result	LHS(CR/SK)	OR	RHS(PA)
$A \rightarrow B$	T	T	OR	F
$A \rightarrow C$	T	T	OR	F
$A \rightarrow D$	T	T	OR	F
$A \rightarrow E$	T	T	OR	F
$BC \rightarrow A$	T	T	OR	T
$BC \rightarrow D$	T	T	OR	F
$D \rightarrow F$				
$D \rightarrow E$	F	F	OR	F

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

$$BC \rightarrow A, D$$

$$D \rightarrow E$$

$$D^+ = DE$$

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

$$BC \rightarrow A, D$$

$$R_1(\underline{A}, B, C, D)$$

$$R_3(\underline{D}E)$$

BCNF

$$A \rightarrow B, C, D$$

$$BC \rightarrow A, D$$

$$LHS(CR/SK)$$