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Assignment 5

1. $R(A,B,C,D,E)$ $FD = \{AB \to C, CD \to E, C \to A, C \to D, D \to B\}$

L	M	R
	A, B, C, D	E

$(A)^+ = \{A\}$

$(B)^+ = \{B\}$

$(C)^+ = \{A, D, B, E, C\}$

$(D)^+ = \{D, B\}$

$(AB)^+ = \{A, B, C, D, E\}$

$(AD)^+ = \{A, D, B, C, E\}$

$(BD)^+ = \{B, D, \}$

Therefore C, AB, AD are candidate keys

2. $R(A,B,C,D,E,F)$ $FD = \{AB \to C, AD \to B, C \to B, F \to AD, F \to E\}$

given
$F \to AD$

Decompisition
$F \to A$
$F \to D$

Transitivity
$AD \to B$
$F \to B$

Union
$F \to AU$
$F \to B$
$AB \to C$

Transitivity
$F \to C$

Given
$F \to E$

Reflexive
$F \to F$

Therefore F is a superkey of R

3. Student (StudNo, StudName) satisfies BCNF

L	M	R
StudNo		StudName

✓ F: StudNo → StudName

StudMajor (Studno, Major, Advisor)

L	M	R
Studno	Major, Advisor	

X F: StudNo, Major → Advisor
Advisor → Major

StudMajor1 (StudNo, Advisor)
StudMajor2 (Major, Advisor)

L	M	R
Studno	Major, Adv	

✓ F: StudNo, Major → Advisor
Advisor → Major

StudCourse (StudNo, Major, CourseNo, Ctitle, Instructname, InstructLocn, Grade)

L	M	R
StudNo CourseNo Major	Instructname	Ctitle InstructLocn Grade

X F: StudNo → StudName
CourseNo → Ctitle, Instructname
Instructname → InstructLocn

StudCourse(StudNo, Major, CourseNo, Grade)

StudCourse2(Instructname, InstructLocn)

StudCourse3(CourseNo, Ctitle, Instructname)

F: StudNo → StudName

CourseNo → Ctitle, Instructname

Instructname → InstructLocn