CSC343 Fall 2015 (L5101/L2501) – Week 11
Student Name: Student CDF ID:

In-class Exercises: BCNF and 3NF

- **Is a relation in BCNF?**

  1. Suppose we have a relation Students(SID, email, course, term, prof), and that these FDs hold: { SID → email; course, term → prof; SID, course → grade. }. Is this relation in BCNF?

  2. Suppose we have a relation Parts(part, manufacturer, seller, price) and these FDs hold: { part → manufacturer; part, seller → price }. Is this relation in BCNF?

- **BCNF Decomposition:**

  Consider the relation R(A,B,C,D,E) with the following FDs: { A → B; CD → E }. It is clear that R is not in BCNF. Apply BCNF decomposition to break down R into smaller relations in BCNF:

- **A lossy join decomposition.** Suppose we have a relation with attributes cdf, name, grade. Here is an instance of that relation:

cdf	name	grade
g3tout	Amy	91
g4foobar	David	78
c0zhang	David	85

1. Suppose we were to decompose this into two new relations: R1(cdf, name) and R2(name, grade). Project the data onto those two new relations.

R1:

cdf	name

R2:

name	grade

2. Now compute $R1 \bowtie R2$ to rebuild the original table.

cdf	name	grade

3. What was lost?

- Suppose we have a relation with attributes movie, theatre, city, and FDs { theatre → city; movie, city → theatre }.

1. Does the functional dependency `theatre` → `city` violate 3NF?

2. Does the functional dependency `theatre` → `city` violate BCNF?