

# CS 450 – Spring 2012

Instructor: Dr. Jessica Lin

## Homework 4 (Extra Credit: 3%)

Due April 25, 2012

**Problem 1 (10 points):** Consider a relation about students in a university. The relation stores students' names, social security numbers, street address, city, state, zip code, area code, and 7-digit phone number. What FD's would you expect to hold? List all that you can think of.

**Note: For the following problem, you will only get credit if you show your work.**

**Problem 2 (40 points):** Given a relation  $R$  with four attributes  $ABCD$  and a set of FD's  $\{AB \rightarrow C, C \rightarrow D, D \rightarrow A\}$

- (a) Use the attribute closure algorithm discussed in class, find all the **non-trivial** FDs that can be derived from the given FDs. Note: an FD  $X \rightarrow Y$  is said to be *trivial* if  $Y \in X$  (e.g.  $AB \rightarrow A$  is an example of a trivial FD).
  
- (b) What are all the candidate keys of  $R$ ?