CS432-CS532 Homework 2

1. [70%] Transform the instructor's ER diagram for the Student Registration System (see the Homework 1 Solutions on MyCourses) to relations using the techniques discussed in class. For composite attributes, use Method 1 (i.e., use the more specific attributes only) to perform the transformation. For each relation, underscore the key, specify other candidate keys (if any) and foreign keys (if any), and specify the constraints associated with this relation (including all constraints that are described in the Requirements Document). What types of constraints can be represented in the ER diagram but cannot be represented in the relational data model?

2. [20%] Let A and B be the only attributes of a relation R.
   1) [10%] Suppose neither A nor B is a key of R. Does the combination of these two attributes, (A, B), form a key of R? Why or why not?
   2) [10%] Suppose the combination of these two attributes, (A, B), is a key of R. Can either A or B be a superkey of R? Why or why not?

3. [10%] Method 1 for transforming IS_A hierarchy discussed in class (see Lecture Notes) can preserve the IS_A relationships among the entities in the entity sets in an IS_A hierarchy. What are the advantages of Method 1 in transforming ER diagrams to relations comparing to Method 2?