CS3431: Project Description
B-term, 2011
Building a Database Application
Phase 1: Conceptual Design

Due Date: Nov. 4, 2011 (8:00 AM).

Description:

In this phase, you will provide a detailed description of your application and an ERD model for it. In the report, you should provide the following:

1) **[10 Points]** Describe in detail your application for which you are building a database. Describe all entities you will consider, the attributes of each entity, the keys and candidate keys in each entity, and the relationships between the entities. ***The minimum number of entities is six*** **(You can provide any number of entities above six).** The description should have two parts:
   a. **[5 Points]** Text description: write the application description in text.
   b. **[5 Points]** List of entities: Provide a list of all entities you will consider in the form of:

   <Entity1 Name>:
   Attribute 1 Attribute-type(string, number, Boolean, date, etc.) Key-or-not
   Attribute 2 Attribute-type(string, number, Boolean, date, etc.) Key-or-not
   …..

   <Entity2 Name>:
   Attribute 1 Attribute-type(string, number, Boolean, date, etc.) Key-or-not
   Attribute 2 Attribute-type(string, number, Boolean, date, etc.) Key-or-not
   …..

2) **[10 Points]** Provide an enumerated list of all cardinality constraints you have in the application between the entities, and the type of the constraint, i.e., 1-1, 1-M, or M-M. ***At least five constraints are required, and of the three types have to be present***. An example of a cardinality constraint, from a banking system, is:

   "1-M relationship between customers and accounts: Each customer may own one or more accounts, while each account is owned be one customer."

3) **[10 Points]** Design and ERD model that captures the design and constraints provided in 1) and 2) above.
   a. You should clearly have for each entity, the EntityName, the list of attributes, and the key attributes underlined.
   b. The ERD should capture all cardinality constraints stated in 2).
   c. For each edge (relationship between entities), the cardinality has to be written on the edge.

4) **[10 Points]** Provide a list of business requirements that cannot be captured in the ERD model. ***At Least three business requirements are needed***. An example of a business requirement, from a banking system, is:

   "A customer cannot withdraw more than what is available in the account"

5) **[10 Points]** Provide a list of ***at least 15 queries*** that you can apply over your database. Write each query in text. An example of queries, from a banking system, are:

   "Q1: Report the available balance of customer X in account Y"
   "Q2: Report the account having the maximum amount of money for customer X"
   "Q3: Report the last 10 transactions performed by customer X"
   "Q4: Report the customer with the highest deposit in the last week"

Grading:

The maximum grade is 50 Points. Late submissions follow the rules stated on the website.

Deliverables:

Each team should deliver a report containing the above requirements.

Submission:

Submit a hardcopy in the beginning of the class (8:00AM), or submit electronically via blackboard.wpi.edu website.