HOMEWORK 2

- Draw the E-R diagram associated to the following specification (Do NOT overload the ERD with the attributes, list the attributes of each entity types and each relationship types and the keys APART). Put the cardinalities on your ERD. There will be only one ISA on your diagram.

The specification presents the requirements document for the registration system as given by the customer.

Note that there are two categories of information stored in the database. Some information is required and some information is optional - they might not be available or might not been have decided on at the time the data are entered.

- We consider a Student Registration Project (for undergraduate students).

- The objectives of the Student Registration System are to allow students and faculty to:
  - Authenticate themselves as users of the system
  - Register for courses (offered for the next semester)
  - Obtain reports on a particular student’s status
  - Maintain information about students and courses
  - Enter final grades for the courses that a student has completed.

In the following enrolled refers to courses a student is currently taking and the term registered refers to courses to be taken by the student in the following semester.

- You have in the University’s Undergraduate Bulletin (including dates) in your possession.

- The following information is contained in the System.

- The system shall contain a name, an id number, a password and a status for each student and faculty member allowed to use the system. The status indicated weather the individual is a student or a faculty member. The password authenticates users and determines their status as students or faculty members. Id numbers are unique. It is assumed that at least one faculty member has been initialized as a valid user at startup time.

- The System shall contain the academic record of each student.

  - Each course the student has completed, the semester the student took the course and the grade the student received (all grades are in the set \{A, B, C, D, F, I\}).
- Each course for which the student is enrolled this semester.
- Each course for which the student has registered for next semester.

- The system shall contain information about the courses offered and for each course the system shall contain:
  - The course name, the course number (must be unique), the department offering the course, the textbook, and the credit hours.
  - Whether the course is offered in the spring, fall or both.
  - The prerequisites courses there can be an arbitrary number of prerequisites for each course.
  - The maximum allowed enrollment, the number of students who are enrolled (unspecified if the course is not offered this semester), and the number of students who have registered (unspecified if the course course is not offered next semester).
  - If the course is offered this semester, the days and times at which it is offered; if the course is offered next semester, the days and times at which it is offered next semester. The possible values shall be selected from a fixed list of weekly slots (e.g., MWF10).
  - The id of the instructor teaching the course this semester and next semester (the id is unspecified if the course is not offered in the specified semester; it must be specified before the start of the semester in which the course is offered).
  - The classroom assignment of the course for this semester and next semester (the classroom assignment is unspecified if the course is not offered in the specified semester; it must be specified before the start of the semester in which the course is offered).
  - Note1: A course can meet during different slots in a week (e.g, MWF10 and TTH5). In this case there are several sections for a same course. On your diagram Course(?) and Class(?) are entity types. Study the relation between Course and Class using the specification (Use a ISA! Why??).
  - Note2: All information shall be consistent which the Undergraduate Bulletin.

- The system shall contain a record of all courses that have been taught, including the semester in which they were taught, and the id of the instructor.

- The system shall contain a list of classroom identifiers and the corresponding number of seats. A classroom identifier is a unique three digits number.

- The system shall contain the identity of the current semester (e.g. F1997, S1999).