###### Cairo University

**Faculty of Computers and Information Information Systems Department Database Systems 1**

**Assignment (ERD)**

**Question-1:**

**Design the conceptual and physical models for the Olympic Games. If you don't think enough information is available, do your assumptions that make it clear.**

The database should store data about all sports, disciplines and competitors. For each sport, the database should contain its name, code and all the disciplines it includes. For each discipline, the database stores a unique name, date of events scheduled for the discipline, the world record, the best result achieved during the games and the continental records for that discipline (including the name of the continent and the result). For each competitor, the database stores his/her name, the country he/she competes for, unique number, gender and birth date. For each discipline a competitor is listed for, we store his/her own record and for each event the competitor participates in we store his/her start number and the result achieved. The database should store the following information about a judge: number (unique), name, the country he/she comes from, and the list of events in which the judge referees. There is additional data for each country like its name.

**Question-2:**

**Design the conceptual and physical models for the Publishing Company. If you don't think enough information is available, do your assumptions that make it clear.**

A publishing company produces scientific books on various subjects. The books are written by authors who specialize in one particular subject. The company employs editors who, not necessarily being specialists in a particular area, each take sole responsibility for editing one or more publications. A publication covers essentially one of the specialist subjects and is normally written by a single author.When writing a particular book, each author works with on editor, but may submit another work for publication to be supervised by other editors. To improve their competitiveness, the company tries to employ a variety of authors, more than one author being a specialist in a particular subject.

**Question-3:**

**Design the conceptual and physical models for the Car Rental Company. If you don't think enough information is available, do your assumptions that make it clear.**

A database is to be designed for a Car Rental Co. (CRC). The information required includes a description of cars, subcontractors (i.e. garages), company expenditures, company revenues and customers. Cars are to be described by such data as: make, model, year of production, engine size, fuel type, number of passengers, registration number, purchase price, purchase date, rent price and insurance details. It is the company policy not to keep any car for a period exceeding one year. All major repairs and maintenance are done by subcontractors (i.e. franchised garages), with whom CRC has long-term agreements. Therefore the data about garages to be kept in the database includes garage names, addresses, range of services and the like. Some garages require payments immediately after a repair has been made; with other CRC has made arrangements for credit facilities. Company expenditures are to be registered for all outgoings connected with purchases, repairs, maintenance, insurance etc. Similarly the cash inflow coming from all sources - car hire, car sales, insurance claims - must be kept of file. CRC maintains a reasonably stable client base. For this privileged category of customers special credit card facilities are provided. These customers may also book in advance a particular car. These reservations can be made for any period of time up to one month. Casual customers must pay a deposit for an estimated time of rental, unless they wish to pay by credit card. All major credit cards are accepted. Personal details (such as name, address, telephone number, driving license, number) about each customer are kept in the database.

**Question-4:**

**Design the conceptual and physical models for the Coca Cola Company. If you don't think enough information is available, do your assumptions that make it clear.**

The Coca Cola Company in Atlanta, Georgia produces a wide range of products that are delivered to its worldwide clients once a week. The company stores information about its employees, products, and customers in a database that includes the following set of tables:

1. The company records the following information about its customers: customer identification number, name, address, X (longitude) and Y (latitude) coordinates of their location, and the amount of time (in fractions of an hour) required making a stop at that location.
2. Each employee has an employee identification number, name, address (which consists of a city, state, and zip code), gender, birth date, position in the company, wage earned per hour of regular time work, wage earned per hour of overtime work, number of dependents, and number of years worked for the Coca Cola Company.
3. Each product has a product identification number, price, and number of units produced per day. Products may be ordered by one or more customers, and a customer may order one or more products. Furthermore, employees produce one or more products, and a product may be produced by exactly one employee.

**Question-5:**

**Design the conceptual and physical models for the Hotel System. If you don't think enough information is available, do your assumptions that make it clear.**

One of the three-star hotels in the Miami area is in the process of updating its database. The hotel has various room types on each of its floors. The rooms may be regular, deluxe, or a suite and each can be either a single, double, or triple. The suites have ocean views and are bigger than the regular rooms. The deluxe rooms are as big as suites, but they do not have an ocean view. All the rooms have air conditioning. Most of the rooms are non-smoking, but the hotel offers some smoking rooms as well. Each floor has a different number of a particular room type. The price of each room differs by the size of the room, the view, and the room’s location (first floor, second floor, etc.). The customers are charged on a per-day basis. The number of days is computed based on the check-in time and the check-out time. The following details are stored for each customer: name, address, check-in date, check-out date, payment method, and final bill amount. In addition to the room charges, there may be extra fees, such as telephone usage, fax services, extra beds, and room service. For this application, we assume that a room can be booked by more than one customer as long as there is no overlap and that a customer can be assigned to any available room.

**Question-6:**

**Design the conceptual and physical models for the Blood Bank. If you don't think enough information is available, do your assumptions that make it clear.**

A blood bank serves a critical purpose in providing a required type of blood to patients at critical times. A blood bank’s database monitors the inventory of the blood together with relevant information such as blood type, date received, location, date of expiry, and donor. The database stores information such as name, address, and telephone number for a blood bank. Supplementary information about the donors is recorded as well. Donors are classified into occasional and regular donors. For the regular donors, the database keeps information such as identification number, blood type, and history of donations. The database also keeps a list of healthcare providers in the area along with their addresses and telephone numbers. The healthcare providers are the customers of the blood bank. They keep track of the blood transactions performed. These transactions are classified into normal transactions and unexpected transactions (for example, due to car accidents during the holiday season). The reason for keeping track of the unexpected transactions is to use this information to estimate the extra amount of blood needed in the inventory for each age group during the next holiday season. A blood bank receives a particular bag of blood from exactly one donor. The blood bank then distributes the blood to health care providers.

**Deliverable rules:**

* The assignment **MUST** be solved individually.
* The assignment **MUST** be solved using Power Designer and printed.
* Submission of assignment is at labs of the week starting on 2 May 2015 at your lab time.
* Assignment copies will be given **ZERO.**