**Individual Assignment 1**

**ER Diagram**

Grading Policy:

1. For each of the questions below, state any assumptions you believe you have to make in order to develop a complete ER diagram.

2. You can draw your diagrams on paper, or use any software or online tools you prefer, for example, Microsoft PowerPoint, Microsoft Visio (Windows only)

<https://calpoly.atlassian.net/wiki/spaces/CPKB/pages/30343213/Install+Software+from+Microsoft+Azure+Dev+Tools>

Lucidchart.com, or draw.io.

3. It is totally fine to discuss this homework with your classmates. But you need to build your own diagrams. A simple copy & paste is not acceptable. If 2 submissions are exactly the same, both of the submissions will get a zero.

Question 1. (10 points)

Each semester, each student must be assigned an adviser who counsels students about degree requirements and helps students register for classes. Each student must register for classes with the help of an adviser, but if the student's assigned adviser is not available, the student may register with any adviser. We must keep track of students, the assigned adviser for each, and the name of the adviser with whom the student registered for the **current term**. Represent this situation of students and advisers with and ER diagram.

Question 2. (15 points)

Draw a data model for the following situation.

Stillwater Antiques buys and sells one-of-a-kind antiques of all kinds (e.g., furniture, jewelry, china, and clothing). Each item is uniquely identified by an item number and is also characterized by a description, asking price, condition, and open-ended comments. Stillwater works with many different individuals, called clients, who sell items to and buy items from the store. Some clients only sell items to Stillwater, some only buy items, and some others both sell and buy. A client is identified by a client number and is also described by a client name and client address. When Stillwater sells an item in stock to a client, the owners want to record the commission paid, the actual selling price, sales tax (tax of zero indicates a tax exempt sale), and date sold. When Stillwater buys an item from a client, the owners want to record the purchase cost, date purchased, and condition at time of purchase.

Question 3. (25 points)

After completing a course in database management, you are asked to develop a preliminary ERD for a symphony orchestra. You discover the entity types that should be included as shown in the following table.

During further discussions you discover the following:

* A concert season schedules one or more concerts. A particular concert is scheduled for only one concert season.
* For each concert there is one conductor. A conductor may conduct any number of concerts or may not conduct any concerts.
* A soloist may perform one or more compositions at a given concert or may not perform any compositions. A composition may be performed at one or more concerts or may not be performed. Each composition may require one or more soloists or may not require a soloist.
* The symphony orchestra also wishes to record the date when a soloist last performed a given composition (Date Last Performed).

Draw an ERD to represent what you have discovered.

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| CONCERT SEASON | The season during which a series of concerts will be performed. Identifier is Opening Date, which includes Month, Day, and Year. |
| CONCERT | A given performance of one or more compositions. Identifier is Concert Number. Another important attribute is Concert Date, which consists of the following: Month, Day, Year, and Time. Each concert typically has more than one concert date. |
| COMPOSITION | Compositions to be performed at each concert. Identifier is Composition ID, which consists of the following: Composer Name and Composition Name. Another attribute is Movement ID, which consists of two parts: Movement Number and Movement Name. Many, but not all, compositions have multiple  movements. |
| CONDUCTOR | Person who will conduct the concert. Identifier is Conductor ID. Another attribute is Conductor Name. |
| SOLOIST | Solo artist who performs a given composition on a particular concert. Identifier is Soloist ID. Another attribute is Soloist Name. |

Question 4. (15 points)

Draw an ERD for the following problem:

A nonprofit organization depends on a number of different types of persons for its successful operation. The organization is interested in the following attributes for all of these persons: SSN, Name, Address, City/State/Zip, and Telephone. Three types of persons are of greatest interest: employees, volunteers, and donors. Employees have only a Date Hire attribute, and volunteers have only a Skill attribute. Donors have only a relationship (named Donates) with an Item entity type. A donor must have donated one or more items, and an item may have no donors or one or more donors.

There are persons other than employees, volunteers, and donors who are of interest to the organization so that a person need not belong to any of these three groups. On the other hand, at a given time a person may belong to two or more of these groups (e.g., employee and donor).

Question 5 (35 points)

Draw and ERD for the following problem:

RentQualityComputers (RQC) is a computer store that specializes in renting computers, printers, scanners, network equipment, game consoles, and games. RQC rents to businesses, nonprofit organizations, and individuals. RQC wants to keep better track of its customers and inventory. A unique customer number is assigned by the store to each of its customers. The store also needs to know the name (first and last name for individuals), email address, phone number, mailing address (including city, state, and zip), and customer type for each customer. Each nonprofit organization and business customer has a contact person, and for each individual customer, RQC wants to know his or her title (Mr./Mrs./Ms./Dr.).

The store has about 500 laptops, 200 tablets, 50 printers, 30 scanners, 20 routers, 40 switches, 500 game consoles, and 1600 games in its inventory, each individually identified. RQC maintains about 200 different game titles and thus, on average, there are eight copies of each game in the inventory. For each individual item, the store needs to know its ID, manufacturer, brand name, serial number, type, purchase date, a brief description, and daily, weekly, and monthly rental fees. For all computers, the company wants to store the amount of RAM, hard drive/SSD space, and processor type; for printers, the total number of copies printed; for scanners, the type of connectivity; for network equipment, the number and types of ports; and for games, the age rating for each title and, for each copy of a game, its medium (DVD, Blu-Ray, proprietary, etc.). For each rental, the store needs to know what items were included, when they were rented, and when they are due to be returned (each item may have a different due date). Each customer can have multiple outstanding rentals at the same time. The acceptable forms of payment are cash, credit card, and PayPal, which must be retained about each rental.