CSCI 4333
Design of Database Systems
Fall 2020
Homework #3

ER Modeling

(1) Download and install "EA Assistant v2.1"
from http://highered.mheducation.com/sites/0072942207/student_view0/e_r_assistant.html. You will need it to draw Entity-Relationship Diagram (ERD).

Other ER tools (such as draw.io) may be acceptable, but discouraged.

(2) Consider a fictional Toy Art Gallery (TAG) described below. TAG has been drastically (and somewhat unrealistically) simplified, with very limited functions. Construct a reasonable ERD to capture the data requirements of the project. List the entities, relationships with multiplicities, and attributes. Specify the primary key of an entity whenever possible. Note that you should use the Crow's Foot notation as supported by EA Assistant v2.1. EA Assistant supports attributes for relationships and your ERD may have relationship attributes.

Submit the .erd, .pdf (of a PDF printout of the .erd file). Name the files: H3_<<Your name>>_<<Your Student ID>>.<<file extension>>. Submit your homework through Blackboard.

Toy Art Gallery (TAG)

A small Arts Gallery would like to construct a database system to support its operations.

TAG sells arts. An artwork has a title, and an optional description. It may also be labeled as a certain style (e.g. classical, Postmodernism, etc.) These styles are defined by TAG and a description for a style may be stored. Each artwork also has a type, again selected from a predefined list of types (such as photograph, painting, drawing, sculpture, miscellaneous, etc.) Each artwork type may have a description. An artwork can be tagged from a list of artifact tags (such as 'commercial', 'fun', 'reflectional', etc.) For example, an artwork can be fun and also commercial.

An artwork may have many copies. For example, many signed copies of a craved painting can be made. The total number of copies of an artwork must be noted, which can be 1 for artwork that has only one unique copy. TAG may sell specific copies of an artwork. For example, it may sell copy numbers 27, 35, and 98 of the artwork "waiting heaven" by Giballo Khan. Thus, TAG is actually selling artwork copies (known as artwork items).

TAG stores information about people that may interact with the system. There is an unique id for each person. The first name and last name are stored. Optional information includes phone, email, address, city, state, and zip code.

A person can assume the role of an owner, in which case, the social security number should be stored (for tax purpose). A second email may also be stored. An artwork item for sale by TAG must be owned by an artwork item owner. Note that the TAG owner can also be an artwork item owner. TAG stores all preferred styles of owners.

Every artwork item has a list price and a baseline price. Different items of the same artwork can have different prices. The owner of an artwork item sets up its list price and base price through discussion with TAG. TAG can sell an artwork item without consulting its owner so long as its sale price is more than the base price.

A person can also be an artist. TAG stores the artist statement, and a description of an artist. Every artwork is created by one or more artists. If there are many artists, one of them is the primary artist and the others are collaborating artists. Note that an artwork may not have a known artist.

A person can purchase artwork items as a customer. TAG stores a status for every customer. A sale may include the purchase of several artwork items. The actual sale price of each artwork item should be stored, together with the amount to be remitted to its owner, and an optional comment. The time of a sale should be recorded, together with an optional comment. For convenience, the total sale price of a sale should be stored. This is the sum of the sale prices of the individual artwork items in the sale.

An artist of an art item can also be its owner and she may not need to be the primary artist of the artifact. Furthermore, she can also be a customer of other artwork items.

Reports and Functions

Some examples of reports and functions that may clarify the data requirements.

Sale Reports:

    (1)   Monthly and daily sale of artwork items with their sale dates, titles, styles, list prices, base prices, and sale prices.
    (2)   Sale reports according to types and styles.

Owner Report:

    (1)   Inventory of artwork items and their sales for a specific owner.
    (2)   Suggestions on modifications of base prices and sale prices for artwork pieces owned by owners.

Artist Report:

(1)   A list of sales of the top five artists by number of sales, including only the titles and styles of the artwork items sold. This may be used in a Web page for listing 'trending arts.'
(2)   Profit analysis of sales by artist. This can be used for future acquisition plans for artworks.

Customer Relationship:

(1)   Sending an email to a customer after a sale to provide information of the sale. Also, include additional artworks that have similar styles of the artwork sold, as well as other artworks by the same primary artists.
(2)   Special event invitations of preferred artists and artworks.