

COMPSCI 2DB3 Assignment 1

Written by Elite Lu

Analysis

In order to analyze the assignment and the choices I made, I will be analyzing each paragraph individually and then creating the ER model. The main properties for information are entities, attributes, relationship, and constraints. If the plagiarism goes off, it is because I copied the assignment question like Dr. Hellings said I was allowed to.

Here is a table of how I will represent the information:

Type of Data	Method of Showing
Entity	Red
Attribute	Blue
Relationship	Green
Constraint	Yellow
Other	Crossed-out

In addition to this, I label artist throughout as an entity even though given the context at times, can seem like an attribute. This will be explained later.

~~A local community group is brainstorming with local artists to support artistry and share artwork with the community in a novel way via an art library that enables the local community to learn about the artists, borrow their art, and support their art (as part of the library subscription fees will return to the artists).~~ The main component of the art library will be the **art catalogue** that maintains information on the art pieces that can be borrowed from the library. In addition, the art catalogue information will be used to promote art pieces and artists via the library website.

Central to the art catalogue are **art pieces**. Each **art piece** has a **unique main artist** and **title** (hence, two distinct artists can both make distinct art pieces named "tomorrow"). Besides the **main artist**, **multiple other artists can contribute to the art piece**. In that case, a strict order of the individual contributions needs to be maintained (e.g., main artist, second contributor, third contributor, and so on). Typically, **art pieces** also have a **time** and **place of creation** (for now, the library expects to only hold newly created pieces for which these details are always available). For display purposes, the art library will maintain the **physical dimensions** (e.g., size of a painting) of each **art piece**.

For some types of art pieces, other details are maintained. Initially, the library will be working with talented painters, sculptors, and photographers. For both **paintings** and **photo prints**, the library will catalogue the **category** (e.g., still life, portrait, landscape, and so on) and the **coloring** (e.g., natural colors or a black-and-white color tone), and the **type of support material** (e.g., canvas or wood) on which the painting was made or photo was printed. For **paintings**, the library will in addition catalogue the type of **paint** used (e.g., oil-based or water-based). For **sculptures**, the library will catalogue its **weight**, whether it can be **displayed indoor or outdoor**, and the **main material used**. Finally, each **photo print will be related to details on the original photo the print was based on** (e.g., the art piece is a reprint on canvas made in 2022 by Freda, based on a photo made by the photographer Xanthe in 1983). In the catalogue, **photos** (the original negatives or the original digital photo file) are non-physical art pieces: they **cannot be borrowed from the library and do not have physical dimensions**, but do have **titles**, an **artist** that created them, other **contributors**, and a **time** and **place** of creation.

For each artist, the library maintains a **profile page** that is used to highlight the **artist** and via which one can find all art pieces of that artist in the catalogue. Each artist profile displays their **name**, their **current location**

(e.g., Hamilton if that is the location of their main atelier), and their **age**. In addition, the artist can add **links** to external resources such as personal websites, Instagram pages, YouTube channels, and so on.

Art pieces can be grouped together, e.g., they can be part of the same **collection(s)**, or they can be part of a group of art pieces made within a collaboration. Each such a group has a **title**, **type**, and **description**. Several groups can have the same title, types, and/or descriptions.

Finally, the library will have members that can borrow art pieces. The library plans to a pre-existing system to manage memberships and payment details. This system will assign a **unique member id** to each **member**. That system will not manage the borrowed and reserved art pieces, however. Each borrowed work **is associated with an** art piece, the member that borrowed it, and the time period during which the work is borrowed. Each reserved work **is associated with an art piece**, the **member that wants to borrow it**, and the time when the reservation was placed (reserving **art pieces** works on a first-come first-serve basis). ~~Members can borrow the same art piece multiple times and members can indefinitely renew their borrow period unless other members have reserved the piece (each renew is registered as a separate borrow).~~

Solution

With the information summarized, I will comprise all of this into an ER model. The information and strategies are mentioned below. Some of the obvious information may be omitted.

I will first start off with the art pieces, which are entities called “ArtPiece”. These entities have the attributes “time” (DATE), “name” (TEXT), “artID” (INT or TEXT), and “place” (TEXT) with “artID” being the primary key. This entity has different specializations, which are isa relations. The first isa relationship is for “PhysicalWork” and “Photos”. This is because two reasons, which is the relation “takeOut” and the attribute “physicalSize” (INT or any numerical value or TEXT for something such as 10 cm x 10 cm). As stated in the problem, photos (NOT photo prints) do not have physical dimensions and as a result, cannot be taken out. As a result, there was a specialization to account for this. The other method would have been to add a tag for whether an ArtPiece entity can be borrowed from the art library. However, this method provides a simpler solution and prevents all Photos from being borrowed. Under the “PhysicalWork” entity, there is another specialization, which is for “2DWork” and “Sculpture”. This isa relationship was done because of the entities “PhotoPrint” and “Painting”. Both have specific attributes that both had that differed from the “Sculpture” such as “category” (TEXT), “colouring” (TEXT), and more. It would be redundant individually make both have these traits without the “2DWork” entity. The attributes for each of the aforementioned entities will be listed below:

Entity	Attributes
2DWork	<ul style="list-style-type: none">• category (TEXT)• colouring (TEXT)• supportType (TEXT)
Sculpture	<ul style="list-style-type: none">• mainMaterial (TEXT)• displayLocation (TEXT or BOOLEAN)• weight (INT)
PhotoPrint	<ul style="list-style-type: none">• None
Painting	<ul style="list-style-type: none">• paintUsed (TEXT)
Photo	<ul style="list-style-type: none">• photoType(TEXT)

(Note: displayLocation can be a boolean if for example, being displayed outside was true and inside was false. However, this is assuming only if it is exclusive or. If it was possible to display the sculpture both outside and inside, then this does not work.)

“PhotoPrint” has a relationship with the entity “Photo”, where every “PhotoPrint” has a referenced “Photo” and strictly one “Photo” referenced. However, there are multiple prints that can be created from a given photo. An example of an “artist” that does this is Andy Warhol (I do not consider him an artist because putting filters on photos is not. My opinion but his existence does help me argue this.).

The next entity would be “Artists”. “Artists” have two relationships with “ArtPieces”, which are “mainArtist” and “contributor”. I made it that every art piece can only have one main artist, which is apparent in the arrow between that relationship and “ArtPiece” to signify this. For the relationship “contributor”, I added an attribute “orderNumber” (INT) to keep the strict order for the contributors. For the “Artists” entity, it has the attributes “artistName” (TEXT), “location” (TEXT), and age (INT). These are not attributes used for the artist profile since these are all attributes pertaining to the person and would feel redundant to put all these attributes on both artist and profile. In addition to this, these attributes are more attached to the artist rather than the profile. I added an artist ID called “aID” (INT) since because two artists can have the same name but be completely different people (Example: I know two girls both named Christine Lin). In addition to this, there is a weak entity attached to it, which is “Link”. The reason why the links are a weak entity is because the links on the profile are owned by the artist. The each link on the profile has an ID called “linkID” (either TEXT or INT depending on how the IDs are written), which is the weak entity key. This was done instead of using a text string for a platform they used because artists can have multiple accounts for different purposes. For me, I have multiple Instagram accounts. One is used for my art and the other one is for embroidery and cross-stitching. “Links” have another attribute, which is “links” (TEXT), which represents a social media link that the artist has.

To meet the requirements for the artwork collection, I added an entity called “Collection” that had a many-to-many relationship on it. I used a bold line to signify that there must be at least one artwork in a collection. A collection without art is pointless. This is because artworks can be part of many different collections and collections can have multiple artworks. For the first point of artworks being part of many different collections, an example showing this can be an artist having collections of a particular theme as one collection and another collection with the character being the focus. I draw in my spare time, so I could group all my Copic drawings into a collection and all my Dragalia Lost (video game) art into another. All the drawings from the game that used Copic markers for colouring would be part of both. Collection has four self-explanatory attributes, which are “collectionID” (Type similar or same as the other primary keys), “title” (TEXT), “type” (TEXT), and “description” (TEXT) with “collectionID” as the primary key.

This leaves the final entity “Member”, which represents members of the library that can borrow the artworks. This entity does not have a relationship with “ArtPieces”. Instead, it has a relationship with the “PhysicalWork” entity since those are the art pieces that can be borrowed. The relationship has three attributes. “borrowedTag” and “reservedTag” are both type BOOLEAN that show if something is borrowed or reserved. Finally, there is “returnDate”, which is of type DATE which specifies when something is to be returned. For the actual entity, “Member” only has “memberID”, which is the ID of the member.

ER Diagram

