

# Worked Example

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- ArtyDesigns is an art gallery in Cork city. The gallery promotes local young artists. Thus Mr. Black, the manager, would like to setup a database to store the data about his business.
- The name, address, contact number and date of birth of each young artist are recorded. For simplicity each artist is given an ID number.
- Each artwork is designed by one and only one artist but each artist will have many works in the gallery.
- Each artwork has a unique code, a title, a creation date and a price.

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- The artwork is only a painting or a sculpture.
- The paint media, i.e. Watercolours, Oils, and Charcoal is recorded for each painting as is the background type i.e. paper, canvas or silk.
- A sculpture will record only the weight and the material of construction e.g. granite, stone or plaster.

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- Twice a year the gallery holds a special gala night where it showcases some of the artwork. Only paintings are displayed here.
- Each gala has an Id, a theme, date and opening time.
- Each gala would be sponsored by at least one sponsor but may have more than one sponsor. Each sponsor will sponsor many galas.
- The ID, name, address, contact person and contact number of each sponsor is recorded.

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- The minimum number of artworks displayed by the gala is eight and the maximum would be fourteen. Note each artwork would be displayed in one gala only. This is because artworks are usually sold during this event.

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- **Step 1.1 Identify entities**

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- **Step 1.1 Identify entities**
  - Artist
  - Artwork
  - Gala
  - Sponsor
- At this stage you could record the fact that artwork is a superclass and Sculpture and Painting are subclasses.

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- **Step 1.2 Identify relationships**



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- **Step 1.2 Identify relationships**

- Each artwork is designed by one and only one artist but each artist will have many works in the gallery.

- Artist 1..1                      **designs**                      1..\* Artwork

- Each gala would be sponsored by at least one sponsor but may have more than one sponsor. Each sponsor will sponsor many galas.

- Sponsor 1..\*                      **sponsors**                      1..\* Gala

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- **Step 1.2 Identify relationships**
  - The minimum number of artworks displayed by the gala is eight and the maximum would be fourteen. Note each artwork would be displayed in one gala only.
    - Gala 1..1      **displays**      8..14 Painting

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- **Step 1.3 Identify and associate attributes with entities or relationships**

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- **Step 1.3 Identify and associate attributes with entities or relationships**
- **Entity Type attributes:**
  - **Artist:** artistId, name (fName, lName), address (street, town, county), contactNumber, DOB
  - **Artwork:** artCode, title, creationDate, price
    - **Painting:** media, background
    - **Sculpture:** weight, material
  - **Gala:** galaId, theme, galaDate, openingTime
  - **Sponsor:** sponsorId, name, address (street, town, county), contactPerson (fName, lName), contactNumber

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- **Step 1.4 Determine attribute domains**
- In the data dictionary record the allowable set of values for the attribute; and the size and format of the attribute.

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- **Step 1.5 Determine candidate, primary, and alternate key attributes**

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- **Step 1.5 Determine candidate, primary, and alternate key attributes**
  - **Artist:** Candidate keys: artistId, name and address, name and DOB, contactNumber  
Primary key: artistId
  - **Artwork:** Candidate key: artCode  
Primary key: artCode
  - **Gala:** : Candidate key: galald, them and galaDate  
Primary key: galald

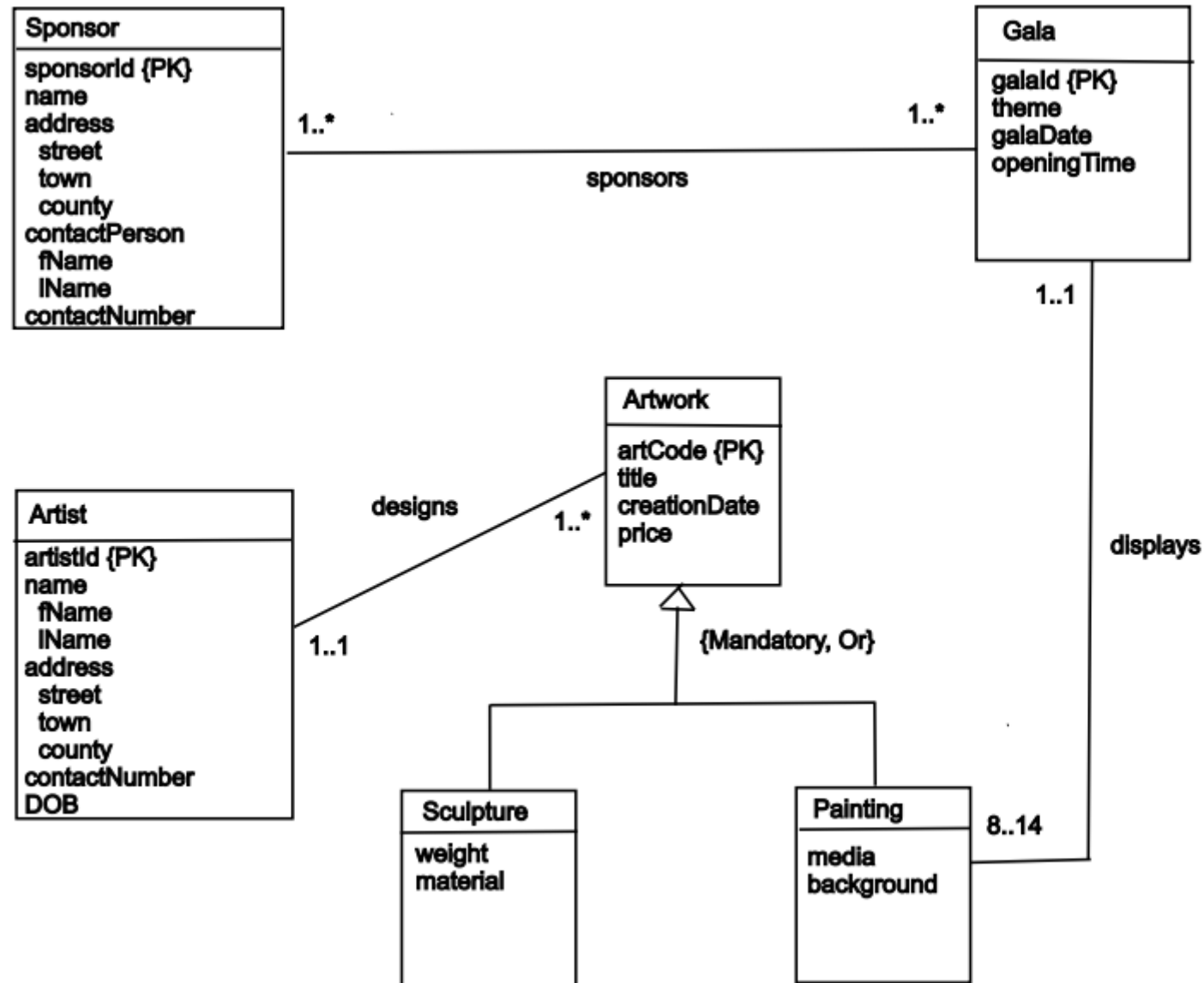
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- **Step 1.5 Determine candidate, primary, and alternate key attributes**
- **Sponsor** : Candidate keys: sponsorId, name and address, contactNumber  
Primary key: sponsorId



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- **Step 2.1 Derive relations for logical data model**
- Firstly, we will map all the entity types to a set of relations:

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- Firstly, we will map all the entity types to a set of relations:

Artist(artistId, fName, lName, street, town, county,  
contactNumber, DOB  
Primary key artistId

Gala(galId, theme, galaDate, openingTime  
Primary key galId

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Sponsor(sponsorId, name, street, town, county, fName, lName, contactNumber

Primary key sponsorId

- We must now map the superclass/subclass hierarchy between Artwork and (Sculpture and Painting).
- Because the Participation constraint is *Mandatory* and the Disjoint constraint is *Disjoint (Or)*, we will choose the option to map the superclass/subclass into one relation for each combined superclass/subclass.

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Sculpture(artCode, title, creationDate, price, weight,  
material

Primary key artCode

Painting(artCode, title, creationDate, price, media,  
background

Primary key artCode

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- Secondly, we will map the relationships:

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Artist 1..1      **designs**      1..\* Artwork

Sculpture(artCode, title, creationDate, price, weight,  
material, artistId

Primary key artCode

Foreign key artistId references Artist(artistId)

Painting(artCode, title, creationDate, price, media,  
background, artistId

Primary key artCode

Foreign key artistId references Artist(artistId)

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Sponsor 1..\*      **sponsors**      1..\* Gala

Sponsorship(sponsorId, galaId)

Primary key sponsorId, galaId

Foreign key sponsorId references Sponsor(sponsorId)

Foreign key galaId references Gala(galaId)



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Gala 1..1      **displays**      8..14 Painting

Painting(artCode, title, creationDate, price, media,  
background, artistId, galald

Primary key artCode

Foreign key artistId references Artist(artistId)

Foreign key galald references Gala(galald)

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## Full set of Tables

Artist(artistId, fName, lName, street, town, county, contactNumber, DOB)

Primary key artistId

Gala(galId, theme, galaDate, openingTime)

Primary key galId

Sponsor(sponsorId, name, street, town, county, fName, lName, contactNumber)

Primary key sponsorId

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Sponsorship(sponsorId, galId)

Primary key sponsorId, galId

Foreign key sponsorId references Sponsor(sponsorId)

Foreign key galId references Gala(galId)

Sculpture(artCode, title, creationDate, price, weight,  
material, artistId)

Primary key artCode

Foreign key artistId references Artist(artistId)

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Painting(artCode, title, creationDate, price, media, background, artistId, galald)

Primary key artCode

Foreign key artistId references Artist(artistId)

Foreign key galald references Gala(galald)