Database Management Systems – MCIS 5133
Dr. Cheng Hong
Homework 3 – Spring 2022

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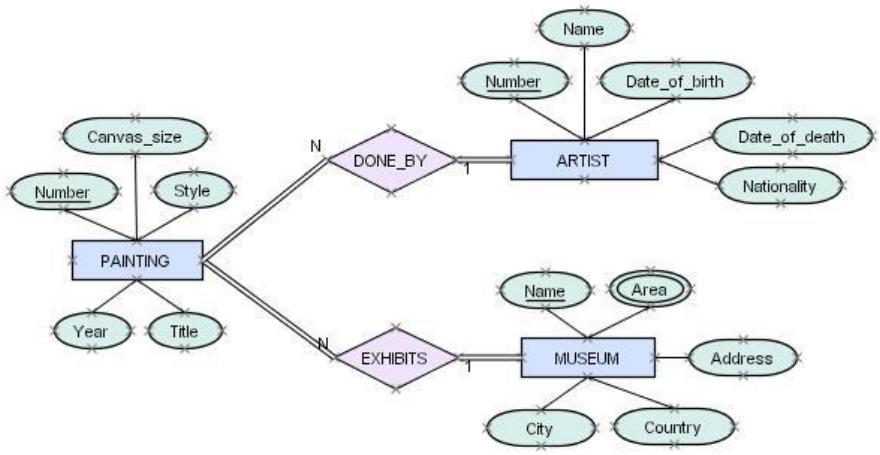
1.



PAINTING

Number	Canvas_size	Style	Year	Title	Anumber	Mname

ARTIST

Number	Name	Date_of_birth	Date_of_death	Nationality

MUSEUM

Name	Address	Country	City

MUSEUM_AREA

Mname	Marea

Steps followed:

1. Mapping of Regular Entity Types
   Regular entities identified: Painting, Artist, Museum
   Simple Attributes of Painting: Number, canvas_size, style, Year, Title
   Simple Attributes of Artist: Number, Name, Date_of_birth, Date_of_death, Nationality
   Simple Attributes of Museum: Name, Address, Country, City
   Primary key for Painting: Number
   Primary key for Artist: Number
   Primary key for Museum: Name

2. Mapping of Weak Entity Types: No Weak entities identified

3. Mapping of Binary 1:1 Relation Types: There are no 1:1 mapping of relation types

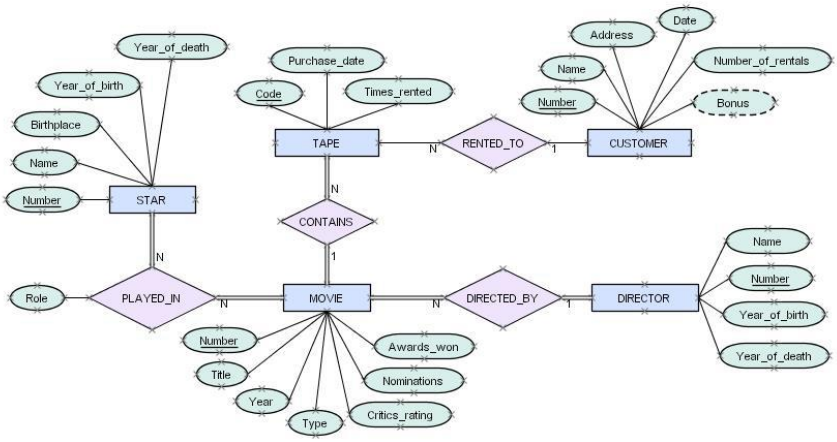
4. Mapping of Binary 1:N Relationship Types: The foreign key approach
   Done_by: Anumber in Painting is a foreign key mapping to Number in Artist relation
   Exhibits: Mname is a foreign key mapping to Name in Museum relation

5. Mapping of Binary M:N Relationship Types: There are no M:N mapping of relation types

6. Mapping of Multivalued Attributes:
   Area in Museum Relation: Creating a Relation, MUSEUM_AREA with attribute Mname and Marea. Both of the attributes would be keys Mname is a foreign key from Name of the relation Museum.

7. Mapping of N-ary Relationship Types : There are no N-ary relationship types

2.



STAR

Number	Name	Birthplace	Year_of_birth	Year_of_death

TAPE

Code	Purchase_date	Times_rented	Mnumber	Cnumber

MOVIE

Number	Title	Year	Type	Critical_rating	Nominations	Awards_won	Dnumber

CUSTOMER

Number	Name	Address	Date	Number_of_rentals

DIRECTOR

Number	Name	Year_of_birth	Year_of_death

PLAYED_IN

Mnumber	Snumber	Role

Steps followed:

1. Mapping of Regular Entity Types
   Regular entities identified: Star, Tape, Customer, Movie, Director
   Simple Attributes of Star: Number, name, Birthplace, Year_of_birth, Year_of_death
   Simple Attributes of Tape: Code, Purchase_date, Times_rented
   Simple Attributes of Customer: Number, Name, Address, Date, Number_of_rentals
   Simple Attributes of Movie: Number, Title, Year, Type, Critics_rating, Nominations, Awards_won
   Simple Attributes of Director: Name, Number, Year_of_birth, Year_of_death
   Primary key for Star: Number
   Primary key for Tape: Code
   Primary key for Customer: Number
   Primary key for Movie: Number
   Primary key for Director: Number
   Derived Attribute : Bonus in Customer (The attribute is not included in the schema but the derivation rules are taken into account during implementation)

2. Mapping of Weak Entity Types: No Weak entities identified.
3. Mapping of Binary 1:1 Relation Types: There are no 1:1 mapping of relation types
4. Mapping of Binary 1:N Relationship Types: The foreign key approach
   Contains: Mnumber in Tape is a foreign key mapping to Number in Movie relation
   Rented_to: Cnumber in Tape is a foreign key mapping to Number in Customer relation
   Directed_by: Dnumber in Movie is a foreign key mapping to Number in Director relation

5. Mapping of Binary M:N Relationship Types:
   Played_in: Creating a relation Played_in. Attributes: SNumber (from Number in Star relation), MNumber(from Number in Movie relation), Role

6. Mapping of Multivalued Attributes: There are no multi valued attributes.
7. Mapping of N-ary Relationship Types : There are no N-ary relationship types