COMP 3610 Database Modelling

Problem Description

RENT-ART-R-US Rental Company rents actual physical fine art objects (paintings, drawings, and sculptures). The company has a stock of unique art objects (or copies of famous art objects). The following data is maintained: a catalogue number, a short name, a description (textual description of style, theme, color schema, medium, etc.), an artist(s), a category (painting, drawing, sculpture), dimensions (up to three dimensions in cm), weight in kg, special handling, rental charge and a replacement cost. The catalogue number uniquely identifies each art object. New objects and categories may be added in the future. Each customer must register as a member. The following data are kept about members: first and last name, address (composed of a street address, city, province/state), up to three phone numbers, registration date. Each member is assigned a unique number. All rental transactions include rental out date, expected return date, actual returned date, rental location (composed of a street address, city, province/state), and a total rental charge.

List of transactions:

1. Add a new member
2. Find a member
3. Add a new art object
4. Find an art object by a category, a title, a catalogue number, specific aspects (color, dimension, etc.)
5. Rent an art object
6. Return an art object

Database Design

1. Conceptual Model - Operational (Transactional Database System)

Draw an **Entity Relationship Diagram** using UML notation for the following situation. Show the relevant entities, attributes, relationships, and multiplicities (min and max).

2. Logical Model – Set of normalized relations

Specify a set of normalized relations (3NF) with primary and foreign keys.

3. Physical Model – Tables in a specific DBMS system

Prepare an SQL script with CREATE statements. Create required tables, indexes, and sequences (for Oracle).

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Specify the degree, cardinality, and participation for each relationship.