CSE4110 - Database System

Project1. E-R design and Relational Schema design

Spring 2024

A Real-Estate Office

"You are a DBA on this web site"

Goal: The goal of the project is to provide a realistic experience in the *conceptual design, logical design, implementation, operation*, and *maintenance* of a small relational database.

Application Description :

The application consists of the operations of a real-estate office. The office needs to keep track of **agents, buyers, sellers, properties on the market, and recently sold properties**. This office focuses on homes rather than business real estate. The management of this real-estate office is not very computer literate. You are being asked to design the database, populate it with sample data (the management won't allow you to test with live data because of privacy concerns), and to write several SQL queries to demonstrate the system. The office deals only on properties in **Seoul**.

To learn more about the application domain, look at the below real-estate web site named "zigbang". It will serve as a useful guideline when you create sample data.

§ zigbang: https://www.zigbang.com/home/apt/subways/375

Refer to actual listings on "zigbang" for detailed information and **prices** of properties, and create any data not available on "zigbang", such as **sellers** and **buyers**, arbitrarily.

According to the client, similar to the data from “zigbang”, for **studio** or **one-bedroom** apartments, there must be at least one interior photo. For **multi-bedroom apartments** or **detached houses**, there should be at least one exterior photo and one floor plan each.
The queries we list below provide some useful hints as well.

Project Requirements :

1. E-R Model
   - Construct an E-R diagram representing the conceptual design of the database.
   - Be sure to allow us to store information without unnecessary redundancy.
   - At minimum you must include all the entity and relationship sets implied by this description. You may go beyond the minimum. Remember that the manager who defined the specifications is not computer literate so the specifications should not be viewed as necessarily being precise and complete.
   - Be sure to identify primary keys, relationship cardinalities, foreign keys and so far.

2. Relational Schema Diagram
   - After creating an E-R model, reducing it into Schema diagram.
   - Create the schema diagram in ERwin Data Modeler we discussed in practice session.
   - Be sure to allow us to store information without unnecessary redundancy.

- Be sure to identify primary keys, foreign keys, relationship cardinalities, relationship type, allowing nulls and so far.
- Every entity should have a name and primary key(s).

3. Queries

The queries listed below are those that you have to find later. They may provide further hints about database design, so think about them at the outset of the project.

a) Find address of homes for sale in the district “Mapo” costing between ₩1,000,000,000 and ₩1,500,000,000.

b) Find the address of homes for sale in the 8th *school district with 4 or more bedrooms and 2 bathrooms.

학군	교육청	지역
1학군	동부교육지원청	동대문구, 중랑구
2학군	서부교육지원청	마포구, 서대문구, 은평구
3학군	남부교육지원청	구로구, 금천구, 영등포구
4학군	북부교육지원청	노원구, 도봉구
5학군	중부교육지원청	용산구, 종로구, 중구
6학군	강동송파교육지원청	강동구, 송파구
7학군	강서교육지원청	강서구, 양천구
8학군	강남교육지원청	강남구, 서초구
9학군	동작관악교육지원청	관악구, 동작구
10학군	성동광장교육지원청	광진구, 성동구
11학군	성북교육지원청	강북구, 성북구

**school district* = 학군

c) Find the name of the agent who has sold the most properties in the year 2022 by total won value.

d) For each agent, compute the average selling price of properties sold in 2022, and the average time the property was on the market. (*Note that this suggests the use of date attributes in your design*)

e) Show photos of the most expensive studio, one-bedroom, multi-bedroom apartment(s), and detached house(s), respectively, from the database.

f) Record the sale of a property that had been listed as being available. This entails storing the sales price, the buyer, the selling agent, the buyer's agent(if any), and the date.

g) Add a new agent to the database.

What to turn in :

- E-R diagram (not hand drawn) made by any chosen tools (e.g.https://online.visual-paradigm.com/diagrams/features/erd-tool/ or you can feel free to use any tools such as MS Powerpoints, keynotes etc.)

- **Relational Schema diagram ERwin file (.erwin)**
  - student_id.erwin (submitted filename)
    e.g. 20241234.erwin
  - Be sure to use the same display options in practice session. (IE notation, display relationship cardinality)
  - Use the title in the schema diagram and description if needed.

- **Report file (.pdf)**
  - [project1]student_id.pdf (submitted filename)
    e.g. [project1]20241234.pdf
  - Describe the detail explanation about your E-R model and Schema
    diagram that you made.

- MAKE YOUR OWN DESCRIPTION on every entity and relationships you made.
- Feel free to use any template you made.

NOTICE :

- **2024.04.19(Fri) 17:00**
- Submit your soft copy with title "[DBproject1]student_id" to **Cyber Campus**(softcopy includes erwin and pdf file you wrote)
- Submit your hardcopy to the box in front of AS809 (**1st** class section) / AS909 (**2nd** class section) before the deadline. (hardcopy includes one E-R model picture and one report you wrote)
- **DON'T COPY ANYTHING FROM YOUR FRIENDS AND WEB SOURCES. IF YOU VIOLATE THIS, YOU WILL GET F FOR THIS COURSE.**