

Roll Number:

CS4.301: Data and Applications (Monsoon 2024)

Quiz 1

Maximum Marks: 20, Time: 30 minutes

- Keep answers concise. State all assumptions.
- All questions are compulsory.

Question 1

Consider that you must design a database for Felicity Buzz. Draw an ER diagram with the following requirements. In 2-3 lines, explain the entity and relationship types you are considering.

(2.5+1+2.5+3+3)

- 5 entity types (including at least 1 weak entity type)
- Relevant attributes for entity types
- 5 relationship types
- Appropriate demarcation of entity types, relationship types, primary and partial keys, derived attributes, multi-values attributes, etc.
- Structural Participation constraints (using the (min, max) notations)

ER diagram (12 marks total)

- 0.5 for each of 5 entity types, -1 for no weak entity type, -0.5 for incorrect entity type
- If attributes are relevant – 1, else 0
- 0.5 for each of 5 relationship types, -0.5 for incorrect relationship type
- Start with 3 marks, and -0.5 for every wrong demarcation
- Start with 3 marks, and -0.5 for every incorrect constraint

Question 2

Briefly describe how you would apply the three-schema architecture to the previous database design.

(3)

Three schema architecture: 1 mark for each level of the three schema architecture. Should either cover what each level means / describe use of each level or schemas at each level in the context of the database design. (3 marks total)

Question 3

Explain the second ACID database principle “consistency” and provide an example of a problem that might be caused if it is violated in your database design.

(2)

1 mark for explaining consistency
1 mark for detailing a possible problem that can be caused by violating it in the current database design

Question 4

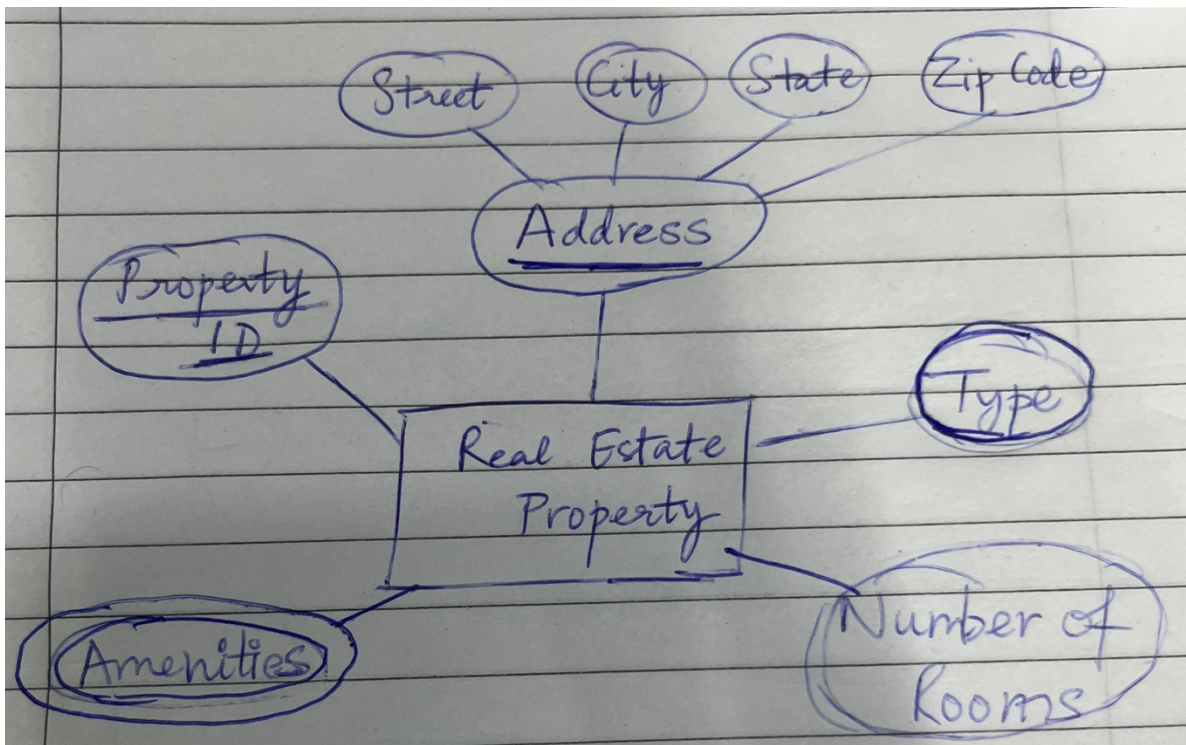
Following is an entity set for real estate. Represent this in ER diagram notation.

Real Estate Property

(Property_ID, Address (Street, City, State, Zip_Code), Type, Number_of_Rooms, {Amenities})

Following are examples of entries in the entity set:

- Property_1: (P1234, ("123 Elm St", Dallas, TX, 75001), Single Family Home, 3, {Swimming Pool, Garage, Fireplace})
- Property_2: (P5678, ("456 Maple Ave", Los Angeles, CA, 90001), Apartment, 2, {Gym, Parking})
- ...



(3)

1 mark for double circle around "amenities"

1 mark for composite attribute "address"

1 mark for underlining candidate key "property ID"