CS4416 - Tutorial 5

Schema Design

INFORMAL DESCRIPTION

An art gallery needs to have the following information stored in a database for items currently owned by the gallery as well as for items which were owned by the gallery once and then sold:

- title of the item
- name of the artist
- contact details of the artist
- type of the item (e.g., paining, drawing, sculpture)
- year the item was created
- year the item was bought by the gallery, who was it bought from and the price
- price of the item if it is currently owned and for sale
- year the item was sold by the gallery, to whom and the actual price agreed
- title, location, opening date, closing date and duration of exhibitions that include the item; only one exhibition can be opened at a particular location on a particular date.

QUESTIONS

a. Design a relational schema for the described database assuming that no NULL values are allowed in the tables. That is:
- list all relations and their attributes; feel free to introduce id numbers.
- underline the key attributes for each relation.
- list the FD's for each table.
- Check whether your tables are in Third Normal Form (3NF) and if it they are not then decompose them to tables in 3NF preserving all FD's.

b. Write SQL statements for creating the tables. Include all definitions of primary keys and foreign keys as well as the following constraints:
- An item cannot be bought in a year before the year it has been created
- The closing date of an exhibition should be after the opening date.

CS4416 - Tutorial 5 - Example Solution

Suggested schema:

artists_collectors(**id**, name, contact_details, type)

items(**id**, artist_id, type, year_created, year_obtained, price)

previous_owners(**item_id**, collector_id)

for_sale(**item_id**, price)

sold(**item_id**, year, price, collector_id)

exhibitions(**id**, title, **location**, **opening_date**, closing_date)

exhibition_items(**exhibition_id**, **item_id**)