CSE 322 Midterm

Olcay Taner YILDIZ

I. QUESTION

Although you always wanted to be an artist, you ended up being an expert on databases because you love to cook data and you somehow confused database with data baste. Your old love is still there, however, so you setup a database company, Art Base, that builds a product for art galleries. The core of this product is a database with a schema that captures all the information that galleries need to maintain. Galleries keep information about artists, their names (which are unique), birth places, age, and style of art. For each piece of art work, the artist, the year it was made, its unique title, its type of art (e.g., painting, lithograph, sculpture, photograph), and its price must be stored. Pieces of art work are also classied into groups of various kinds, for example, portraits, still lifes, works by Picasso, or works of the 19th century; a given piece may belong to more than one group. Each group is identied by a name (like those above) that describes the group. Finally, galleries keep information about customers. For each customer, galleries keep their unique name, address, total amount of dollars they have spent in the gallery (very important!), and the artists and groups of art that each customer tends to like. Draw the ER diagram for the database.

Draw the ER diagram for your schema. Be sure to indicate all key and cardinality constraints and any assumptions that you make.
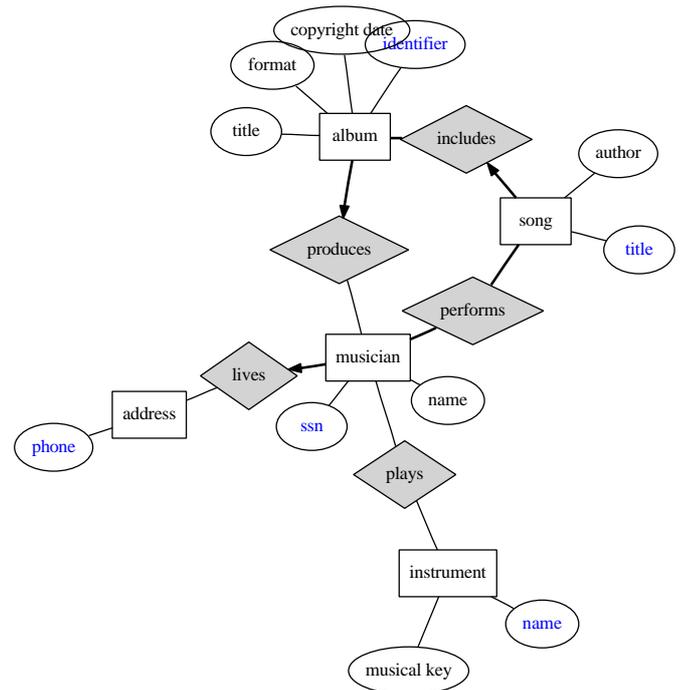
II. QUESTION

Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer (at your usual consulting fee of $2,500/day).

- Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musician soften share the same address, and no address has more than one phone.
- Each instrument that is used in songs recorded at Notown has a name (e.g., guitar, synthesizer, ute) and a musical key (e.g., C, B-at, E-at).
- Each album that is recorded on the Notown label has a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
- Each song recorded at Notown has a title and an author.
- Each musician may play several instruments, and a given instrument maybe played by several musicians.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform a number of songs.

- Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Given the following ER diagram of this database, write the SQL statements for creating relations corresponding to the entity sets and relationship sets.

III. QUESTION

Consider the following relations about the suppliers-parts-projects database. The significance of an shipment row is that the specified supplier supplies the specified part to the specified project in the specified quantity.

Suppliers(sid:integer, sname:string, status:integer, city:string)

Parts(pid:integer, pname:string, color:string, weight:integer, city:string)

Projects(prjid:integer, prjname:string, city:string)

Shipment(sid:integer, pid:integer, prjid:integer, quantity:integer)

Write the following queries in Relational Algebra.

1) Get full details of all projects in London.
2) Get full details for parts supplied by a supplier in London.
3) Get part numbers for parts supplied by a supplier in London to a project in London.

4) Get part numbers for parts supplied to all projects in London.
5) Get all cities in which at least one supplier, part, or project is located.

IV. QUESTION

Given the relations above, write the same queries in SQL.