

44CCS1DBS Database Systems

Coursework 2018

Part 1: Design

Student name:

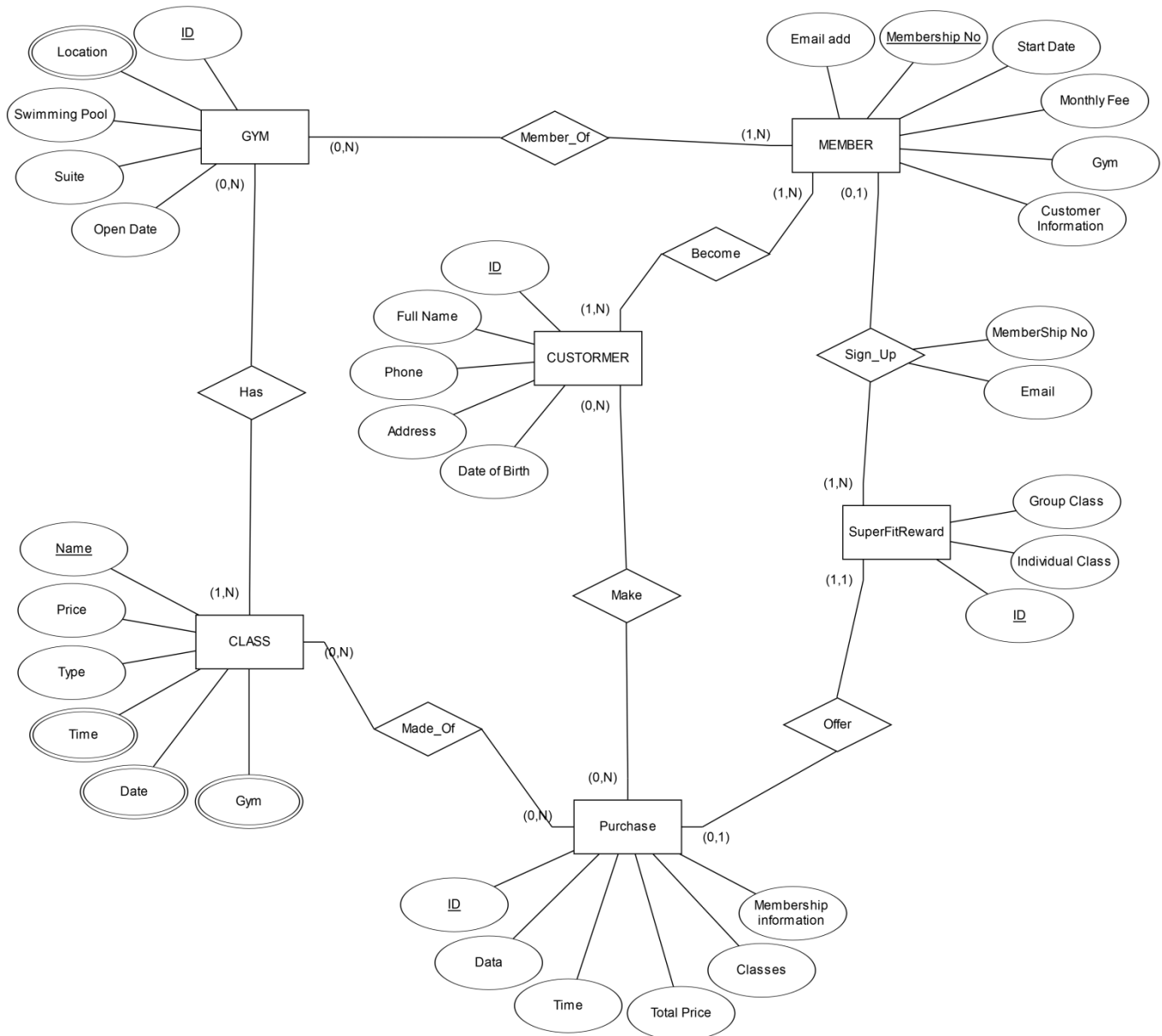
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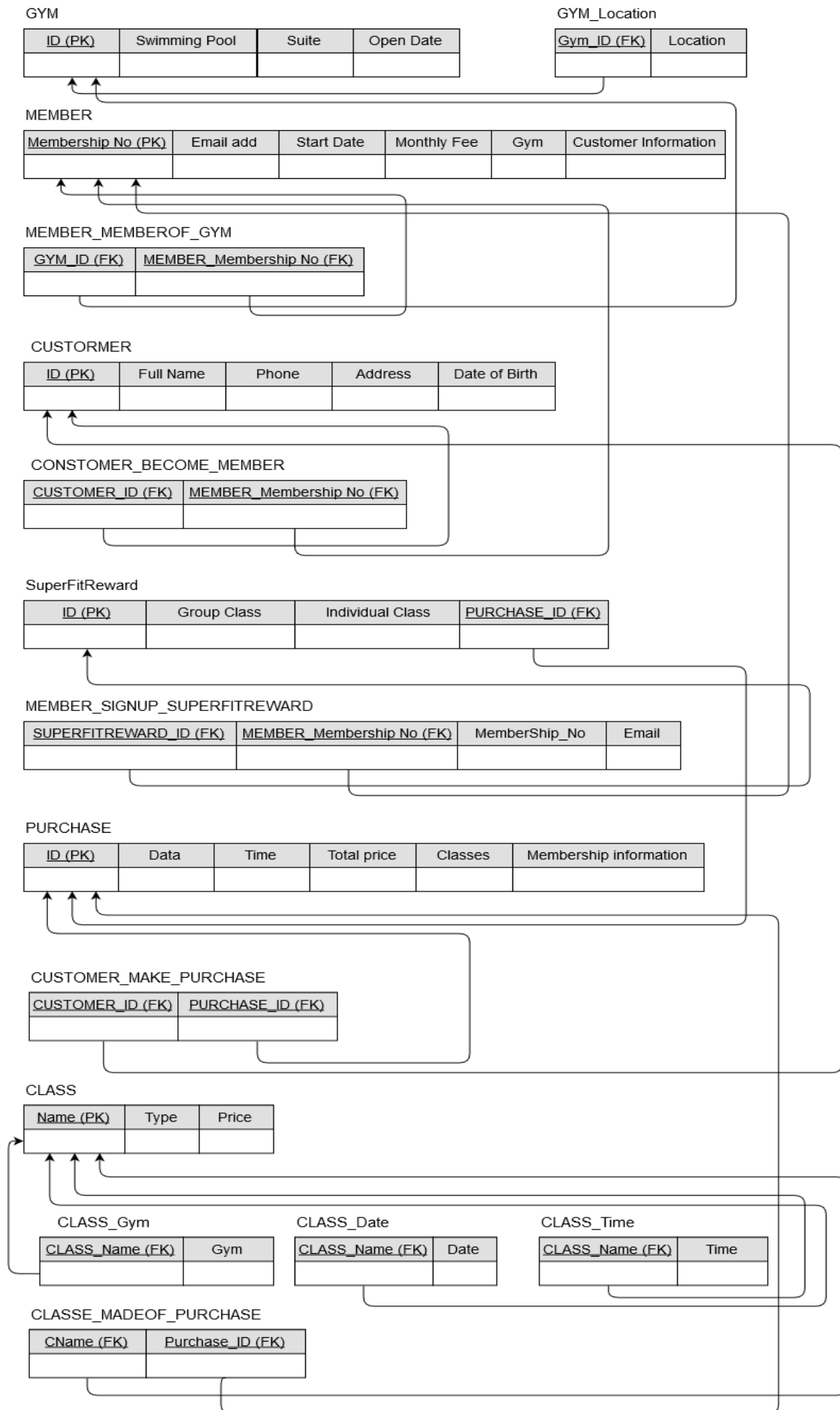
## ER Diagram:



## Explanation:

- The “ID” attribute is added to “CUSTOMER” entity because the customer did not have any unique value to use in “Become” relationship.
- “Group Class” and “Individual Class” attributes in “SuperFitReward” are used for store the number of classes that each member has, so if each member purchased 10 group classes he can get 1 free group class and if he purchased 5 individual classes, he can get 1 free individual class.
- The “ID” attribute in “SuperFitReward” entity keeps member id.
- For “Offer” relationship, if each customer have the condition for getting reward, then they must offer only one purchase (1,1) and each purchase can be offered by at least no one or at most one person(0,1).

## Relational Schema:



## Constraints:

- **Entity Integrity Constraints:** Entity Keys will be underlined and cannot be NULL. Relationship keys are composite keys consisting of the primary key of each of the entities which participate in the relationship.
- **Referential Integrity Constraints:** Foreign Keys in relation tables are defined by (FK) and Primary Keys are defined by (PK) in their relations. The way the foreign keys are named is < foreignTableName >\_<foreignPrimaryKeyName >.

- **Domain Constraints:**

CUSTOMER (ID: Integer, Full Name: String, Phone: String, Address: String, Date of Birth: Date (yyyy-mm-dd))

GYM (ID: Integer, Location: String, Swimming Pool: Boolean, Suit: Boolean, Open Date: Date (yyyy-mm-dd))

CLASS (Name: String, Price: Integer, Type: String (group or individual), Time: Time (hh:mm), Date: Date (yyyy-mm-dd), Gym: Integer (gym ID))

- **Semantic Constraints:**
  - Gym.OpenDate, Member.StartDate, Customer.DateOfBirth, Purchase.Date should all be past dates.
  - All the characters of Customer.Phone should be numbers with the exception of the first character which may be "+".
  - All the characters of Customer.Phone should be numbers with the exception of one character which must be "@".