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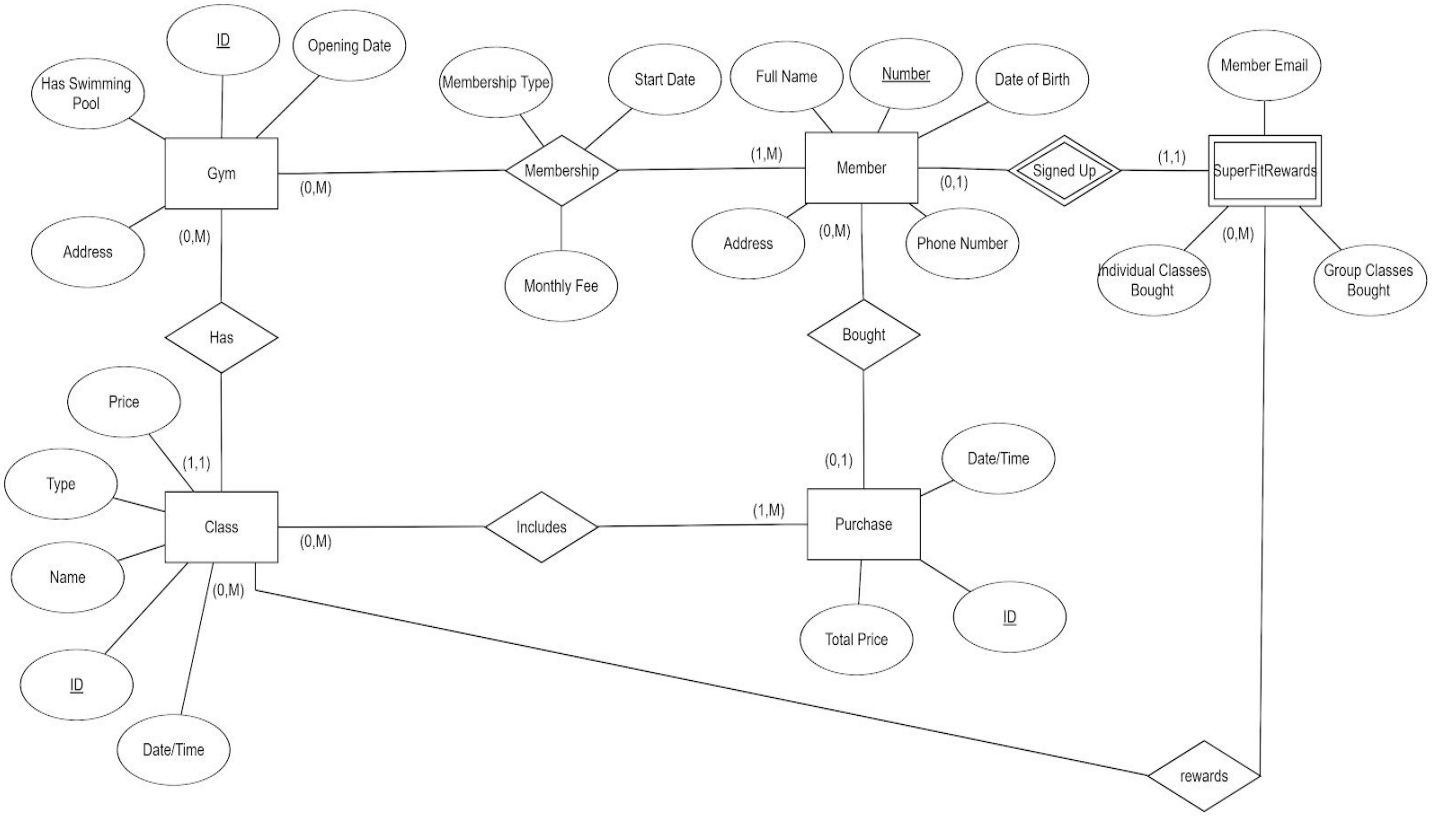
Coursework Part 1

ER Diagram



Relational Schema

Gym

ID (PK)	Opening Date	Address	Has Swimming Pool

Member

Full Name	Number (PK)	Date of Birth	Address	Phone Number

Class

Price	Type	Name	ID (PK)	Date/Time	Gym ID (FK)

Purchase

Date/Time	ID (PK)	Total Price	Membership Number (FK)

SuperFitRewards

Member Email	Group Classes Bought	Individual Classes Bought	Membership Number (FK) (PK)

Purchase_Includes_Class

Purchase ID (FK) (PK)	Class ID (FK) (PK)

SuperFitRewards_Rewards_Class

Membership Number (FK) (PK)	Class ID (FK) (PK)

Member_Gets_Membership_at_Gym

Gym ID (FK) (PK)	Membership Number (FK) (PK)	Membership Type	Start Date	Monthly Fee

Domain Constraints for 3 Relations

Gym (Opening Date: Date, ID: Integer, Has Swimming Pool: Boolean, Address: String)

Member_Gets_Membership_at_Gym(Gym ID: Integer, Membership Number: Integer, Membership Type: {'GymOnly', 'SwimOnly', 'Gym&Swim'}, Start Date:Date, Monthly Fee: String)

Class (Price: String, Type: {'Group', 'Individual', Name: String, ID, Date/Time: String, Participation Limit: Integer)

Semantic Integrity Constraints:

Membership.MembershipType can be set to 'SwimOnly' or 'Gym&Swim' only if the Has Swimming Pool attribute in the corresponding Gym instance of the relationship is set to true. If it is set to false, Membership Type must be set to 'GymOnly'.

If Class.Type is set to 'individual', then the constraint for the includes relationship is (0,1) on the class side and (1,1) on the purchase side of the relationship.

Class.Price and Membership.MonthlyFee should begin with the '$' character and display a number rounded to the hundredth decimal place in order to represent dollar values.

Assumptions

-Members can buy memberships at multiple gyms, but they only have one membership number

for all the gyms they are a member at.
-It would be useful to know the address of each Gym as well, so I have included an Address attribute for the Gym entity.
-When a non-member purchases a class, no personal information is stored about him in the database. Only information about the purchase is stored in the database system.
-We can suppose that members and non-members gain access to a class by be being told the value of the Purchase.ID attribute.
-There is no limit defined for how many people can purchase a group class. We can suppose that the Gym website/reception desk will revoke the class offer once the gym staff decides enough people have signed up.