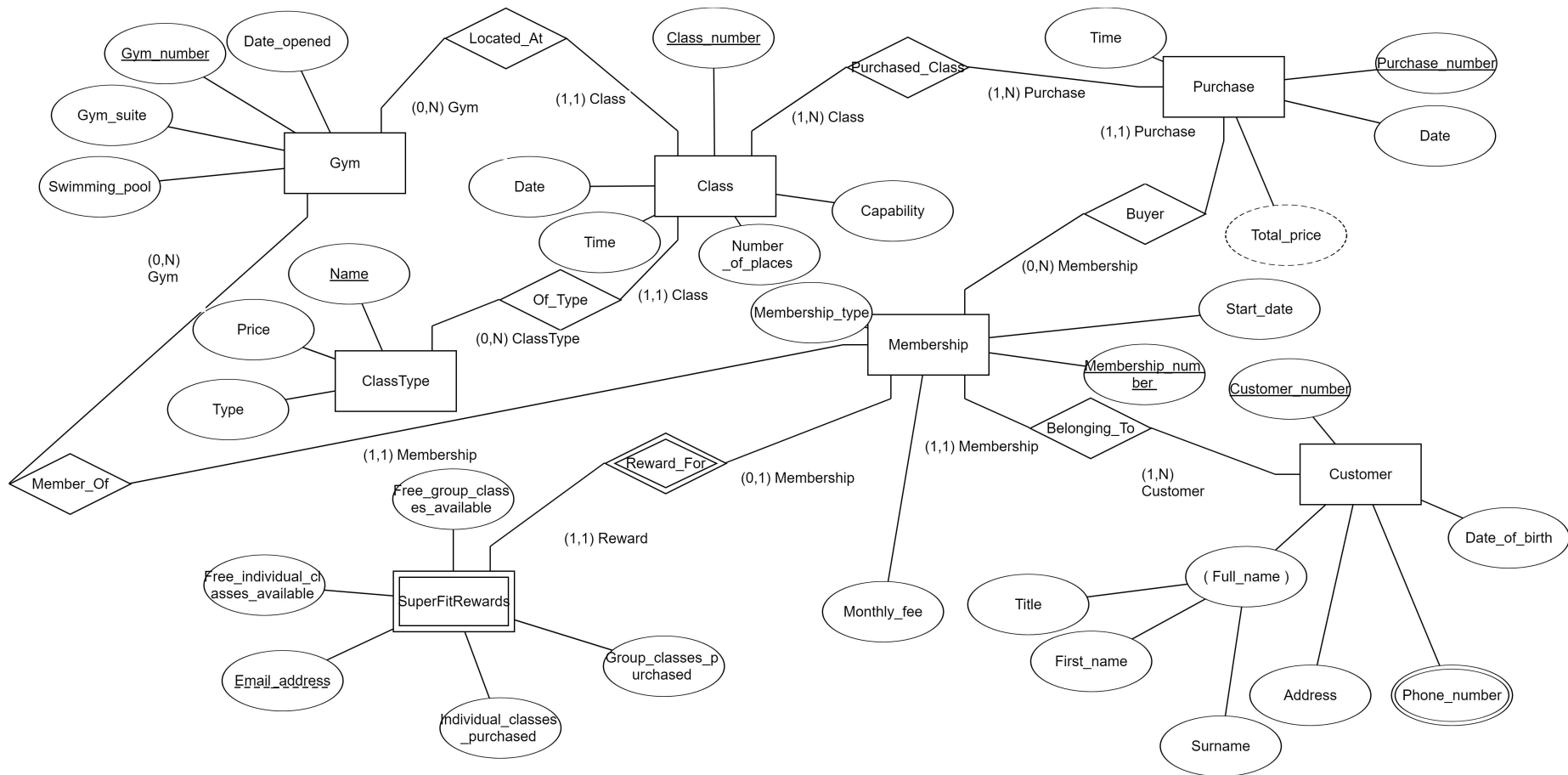


Part1 Design

ER
Diagram

Assumptions and choices

- A customer entity, separate from the membership entity, was created since a customer can have membership of more than one gym
- The customer name was created as a composite attribute because it might be useful to query on the individual parts of the name.
- The customer's phone number is a multivalued attribute as a customer may have more than one phone number.
- There should not be a rewards scheme that does not link to a membership so superFitRewards is a weak entity.
- Classes have limited places.
- The total price for a purchase is a derived attribute as it should be possible to calculate used the purchased classes.
- Total price is still included in the relational schema as it would be useful.
- Classes must have at least one purchase as there would be no point in running a class with no one in it.
- Each customer has to have a membership since purchases by non customers are stored without details.

Database Systems Coursework Assignment

Gym Part1 Design

Relational Schema

<u>Gym_number</u>	Gym_suite	Swimming_pool	Date_opened
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ClassType

<u>Name</u>	Price	Type
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Class

<u>Class_number</u>	<u>Date</u>	Time	Capability	Number_of_places	Gym_number	Name
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Purchase

<u>Purchase_number</u>	Date	Time	Total_price	Membership_number
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Membership

<u>Membership_number</u>	Membership_type	<u>Start_date</u>	Monthly_fee	Gym_number	Customer_number
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Customer

<u>Customer_number</u>	Title	First_name	Surname	Address	Date_of_Birth
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SuperFitRewards

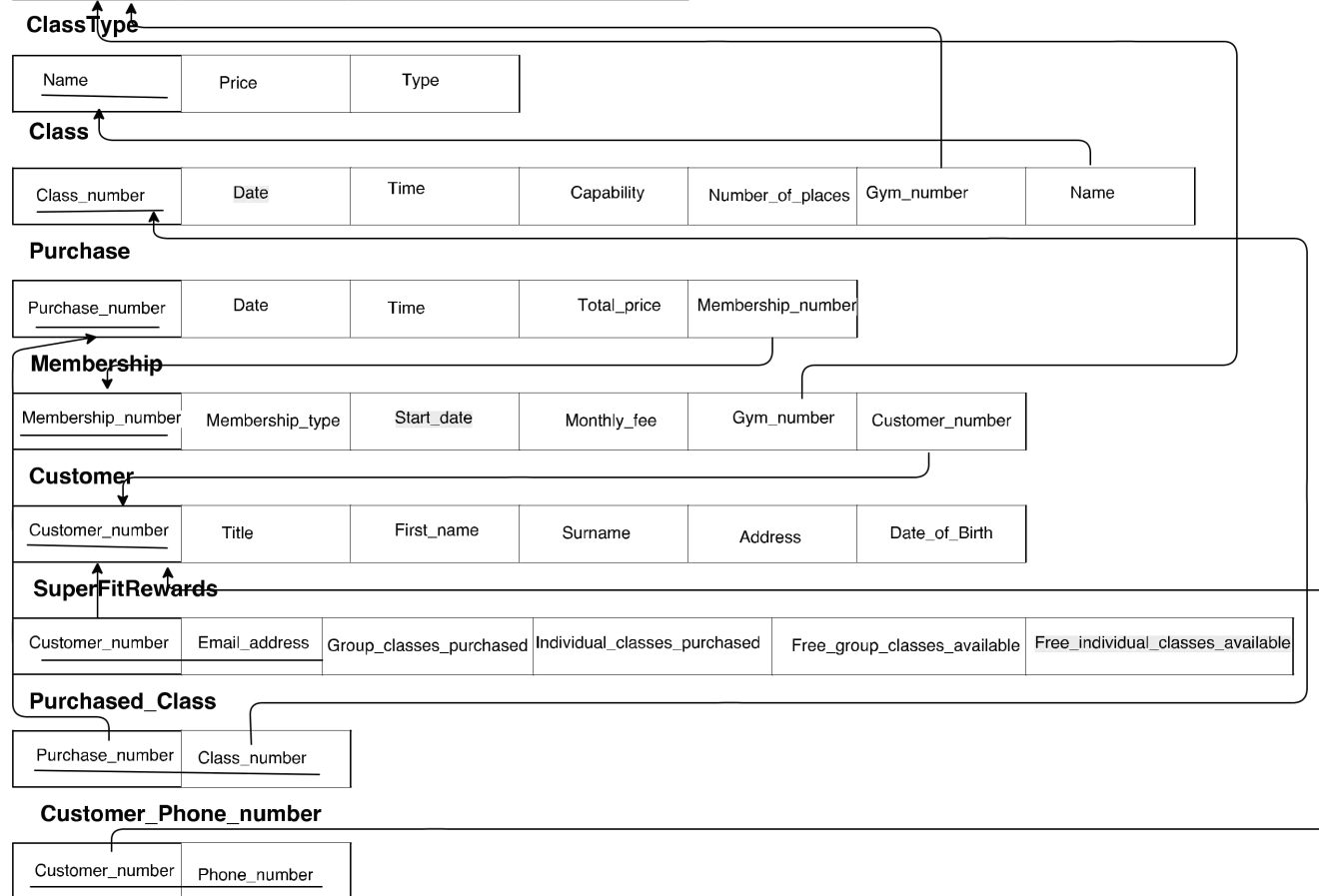
<u>Customer_number</u>	Email_address	Group_classes_purchased	Individual_classes_purchased	Free_group_classes_available	Free_individual_classes_available
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Purchased_Class

<u>Purchase_number</u>	<u>Class_number</u>
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Customer_Phone_number

<u>Customer_number</u>	<u>Phone_number</u>
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Constraints

Primary/ Foreign keys

- Purchase - Purchase_number (PK) , Membership_number (FK)
- Gym - Gym_number (PK)
- Class - Class_number (PK) , Gym_number (FK) , Name (FK)
- ClassType - Name (PK)
- Membership - Membership_number(PK) , Gym_number (FK) , Customer_number (FK)
- Customer - Customer_number (PK)
- SuperFitRewards - Email_address, Customer_number (PK), Customer_number (FK)
- Customer_Phone_number - Phone_number (PK) , Customer_number (FK)
- Purchased_Class - Purchase_number, Class_number (PK), Purchase_number (FK) , Class_number (FK)

Domain constraints for 3 relations

Relation	Attribute	Constraint
Purchase	Purchase_number	A nine digit number
	Date	Date format
	Time	Time format
Customer	Membership_number	A nine digit number
	Customer_number	A nine digit number
	Title	Ten characters
	First_name	Twenty characters
	Surname	Twenty characters
	Address	One hundred characters
	Date_of_birth	Date format
ClassType	Name	Twenty characters
	Price	Decimal nnn.nn
	Type	One character
	Class_number	A nine digit number

Semantic integrity constraints

Swim options

The membership type can only be one of three options; GymOnly, SwimOnly and Gym&Swim. The swim options are only available in gyms which have a swimming pool.

Capabilities

There can only be a limited number of capabilities (for example, beginner, moderate, experienced).

Maximum purchases per class

The Number_of_places attribute stores the maximum purchases for each particular class. This must not be exceeded.