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03/12/23

Conceptual Design

ER Diagram attached.

Each member has a unique ID, as well as name, a unique email, password, and member points. Each member also has a set of fitness goals, and a set of health metrics.

Members are responsible for paying bills for the services they are receiving. Members can have any number of bills assigned to them, which track which member needs to pay, what the bill is for, how much the bill is, and when the bill was paid (if it has been paid yet). Bills cannot exist on their own, and require a member to be assigned to.

Personal trainers have a unique ID and email, a name, and a password, and are assigned to train members at the member's discretion.

Members can participate in any number of Events, which contain a unique ID, a name, date of occurrence, and what type of event it is.

Members can also participate in Personal Training sessions, which cannot exist without a member participating. PT sessions track the date of occurrence, the topic covered in the session, and any progress notes made by the personal trainer assigned to the session.

PT sessions and events are held in Locations, which have a unique ID and a name, as well as a multivalued attribute that tracks the equipment inside that location.

Staff have a unique ID and email, and have a name, password, and role. Staff don't directly participate in anything, but they will have special permissions that allow them to manage billing, scheduling, and equipment from the front end of the DBMS.

Reduction to Relational Schemas

First schema iteration In Repo.

Members:
ID → Email, Password, Name, Points
This is 2NF and 3NF.

Fitness Goals:
Member ID → Goal, Progress, Target
This is 2NF and 3NF.

Health Metrics:
Member ID → Type, Value
This is 2NF and 3NF.

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Participates:
This table is just being used to connect the members table to the event table. I've used this to prevent a non-2NF or 3NF scenario. There should never be a duplicate entry in this table as a member cannot enroll in an event multiple times.

Bills:
? → PaidBy, PaidFor, Amount, PaidDate
This table has no key, and will need to be updated as you can have a bill that is paid by a member for a reason with the same name as another bill on the same date for the same amount, even if that is rare. So the bills table will be updated with an ID to uniquely identify bills which all the other variables will rely on as the primary key.
It becomes: ID → PaidBy, PaidFor, Amount, PaidDate

PT Sessions:
Member ID, Trainer ID → Topic, Date, Notes, Location ID
This is 2NF and 3NF.

Trainer:
ID →Name, Email, Password
This is 2NF and 3NF.

Events:
Event ID → Name, Type, Date, Location ID
This is 2NF and 3NF.

Location:
ID → Name
This is 2NF and 3NF.

Equipment:
? → Location ID, Name
This table has no key, and will need to be updated as you can have instances of multiple equipment with the same name in the same location, so a primary key of equipment ID will need to be added that all the other data will rely on.
it becomes: ID → Location ID, Name

Staff:
ID → Name, Email, Password
This is 2NF and 3NF.

Updated Schema In Repo.