6210 Project P2

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Fitness database

A close up of a map

Description automatically generated

Purpose:

The purpose of this database is to maintain the data used to generate and support member activities. It will be a robust and secure system used by administrative supervisors. The members will also be permitted to create accounts and register for lessons online, as well as managing their balance.

Business problems addressed:

1. Allow the supervisor, staff, physicians and coaches to generate descriptive reports.
2. Permit supervisor to manage staff ,physicians and coaches.
3. Provide information to enhance or improve lesson scheduling. (e.g., conflict to events)
4. Allow members to manage themselves online.
5. Allow the system to generate a random locker for the member each time they sign in for exercise.
6. Supply insight for the supervisor to decide which type of lesson to set up more.

Business rules:

1. A supervisor can be a staff, physician or coach, but cannot be all of them.
2. A member can only own one locker at a time.
3. A supplier will provide one or many equipment.
4. Ship\_Date cannot be prior to Order\_Date for equipment.
5. Each staff may have zero or more repairments.
6. Each staff may have zero or more suppliers.
7. Each equipment may have zero or more repairments.
8. Each staff may manage zero to more lockers.
9. Each physician may manage zero to more treatment.
10. Each members may have zero to more treatment.
11. Each coach may have zero to more lesson registration.
12. Each member may have zero to more lesson registration.
13. Each member will have one balance account.
14. Each room may assigned to zero to more lesson registration.
15. Each lesson may have zero to more less registration.

Design Decisions:

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| Entity Name | Why included | How related to other entities |
| Member | One of the primary purposes of the system is for members to create accounts, collecting information about lessons, registering for lessons online, and paying bills for membership and lessons. Members can also appoint one or more treatments. What’s more, members can check their bills and balance through balance accounts. | As one of the core entities in our database, the Member entity’s primary key, memberID, relates it to balance, treatment, etc.,so that data can be collected about these factors in relationship to the attendance of our fitness club. An associative entity, LessonRegister, is created to connect the member entity to many other entities. An associative entity, LockerAssignment, connects Members and Lockers through a many-to-many relationship. Supervisors can track member performance and attendance for the lessons they registered, as well as the physician and treatment performances through our database system.  Member entity will send the MemberID to the Treatment entity. |
| Supervisor | An important purpose of this database is to allow supervisor to gather information about the entire gym. Based on the information, supervisor can make decisions about whether a gym's curriculum is reasonable and evaluate the teaching quality of each coach according to the attendance rate, member feedback and treatment of members . Supervisor can also evaluate the quality of equipment from different suppliers by tracking the Repairment entity. | A supervisor can be one of the staff, physician or coach entities, but not all of them at the same time. The Supervisor entity is related to the Staff, Physician and Coach entity due to the one-to-many relationship accordingly. It is also related to the Lesson entity due to one-to-many relationship. |
| Coach | As one of the subclasses of Supervisor, the Coach entity will keep in charge of LessonRegister. They will teach lessons according to their specialization, such as yoga, dancing, etc. The fitness system will track the quality of coaches on lesson registers, mainly through recording the attendance of members for each lesson. | The Coach entity is related to the Member and Lesson entities through an associative entity (LessonRegister), with a many-to-many relationship. Many coaches may be registered to one member and there are many members for which a coach may teach. |
| Lesson | The lessonID will be posted on the fitness website for members to register by themselves. Members can register for lessons online, which is more convenient compared to other clubs. The fitness club will track member registration for each lesson, especially if a particular lesson has well performed attendance rate. | The Lesson entity is related to coach and member entities through an associative entity (LessonRegister), with a many-to-many relationship. The lessonID will be inherited to the LessonRegister entity, as a foreign key. |
| LessonRegister | Lesson registration will be allocated according to coach specialization. The LessonRegister entity tracks the performances of coaches, lessons and members. It records the coaches who teach specific lessons, as well as the members registered to these lessons. The rooms will also be allocated for lessons, 1 hour for each section. The club is willing to enhance or increase the quality and sections for these lessons, in order to attract more members. | The lesson register entity is an associative entity connecting Lesson, Coach, Member and Room. The primary keys of these entities will be inherited to generate this entity, which provides plenty of information to the supervisor about the lessons. |
| Room | Rooms are allocated to lessons, 1 hour for each section with a specific room number. | The Room entity will be connected to other entities through an associative entity (LessonRegister), with a many-to-many relationship. Members or coaches will be able to find their RoomID through CoachID or MemberID from the LessonRegister entity. Furthermore, they can find the location (first floor, second floor, etc.) according to RoomID from the Room entity. |
| Physician | As one of the subclasses of supervisor, the Physician entity will keep in charge of Treatment. They will have different treatment for members, such as Recovery training, rehabilitation training, muscle strain treatment, nutritional diet advice, etc.The fitness system will track the impact of Physician on treatment registers, mainly through recording the attendance of members for each treatment. | The Physician entity is related to member entities through an associative entity (Treatment), with a many-to-many relationship. One Physician may have many treatments. One treatment must only belong to one Physician. |
| Treatment | The Treatment entity tracks the performances of Physician and Member. It records the Physician who treats Members, as well as the members registered to these treatments. The physicians will be allocated for Treatments, responsible for their own members. | The Treatment entity is an associative entity connecting the Physician and the Members entity. The primary keys of these entities will be inherited to generate this entity, which provides a large amount of information to supervisor about the treatment. The primary key of the Treatment entity, TreatmentID, will be related to the PhysicianID and the MemberID. the Treatment\_Date will also be recorded to help the physicians with members recovery. |
| Staff | As one of the subclasses of Supervisor, the Staff Entity’s primary key, StaffID, is related to Supplier, Locker and Equipment, through an associative entity (Repairment). The Staff is responsible for allocating lockers, fixing the equipment and contacting suppliers. | The staff is responsible for multiple events in our fitness center, so it is related to many entities, including Supplier entity and Locker entity. It is also linked to Equipment entity through an associative entity (Repairment). The staff is supposed to manage the repair of equipment as well as contacting the suppliers. If there are any problems with the lockers, the members could turn to staff for help. |
| Repairment | The safety of equipment is the main issue of every fitness club, so we need to figure out the date each equipment is repaired. The staff has their own responsible area, which they need to take care of all the equipment. | The Repairment is designed as an associative entity which connects the Equipment Entity and Staff Entity. It contains the information of which equipment was repaired, followed by the staff who performed that. |
| Equipment | Equipment is the main component of every fitness club. The staff taking care of the equipment will check the warranty period frequently and contact the suppliers through supplierID. The ship date, order date and equipmentID are the attributes of Equipment, which ensures the staff to confirm the equipment if something went wrong during shipping. | The Equipment Entity is directly related to Supplier Entity, since one supplier could provide one or more equipment to the fitness center. The Equipment entity connects Staff Entity through an associative entity (Repairment), which the equipment encounters some problems, the staff could contact the supplier. |
| Supplier | Each Staff contacts one or more suppliers to order equipment for the fitness club. The Staff could contact suppliers through the Contact\_No and figure out the company's reputation through the Company\_Name. | The Supplier entity is directly related to Equipment entity and Staff entity. The Supplier will provide one or many equipment to the fitness center, and if there are any problems with the equipment, the staff could contact suppliers. |
| Locker | The Locker entity contains an attribute named code, which will automatically update after being used by a member. If something happened to the lockers, members can find the staff through staffID to solve the problems. | The Locker entity is directly related to Staff entity. If there are any problems on locker, members can contact the staff through staffID. It is also related to the Member entity through an associative entity (LockerAssignment) due to many-to many relationship. Each locker can be allocated to multiple members, and each member gets a random locker every time. |
| LockerAssignment | The LockerAssignment records the condition of each Locker, as well as which member used the locker during which specific time period. | The LockerAssignment is an associative entity, including which members used the locker, which locker was used and the time period the locker was used. |
| BalanceAccount | The Balance Account records the members’ bills and balance. | The BalanceAccount entity is directly related to the Member entity since each Member will have one Balance Account. |