**Gym Database Application**

**- Functional Dependencies and Minimal Cover -**

**Instructor**:

ECHIHABI Karima

**Teaching Assistants**:

ZEROUARI Hasnae

ABDENOURI Khaoula

**Group members**:

BENFELLAH Ikram

BENJELLOUN Elghali

BLALI Yassine

KABLY malak

**Introduction:**

In the upcoming document, we've compiled the functional dependencies and their minimal covers for each part of our database.

**Membership**:

Membership is an entity that represents a given subscription within our gym, as attributes it got an id, *number\_of\_person involved* (for example for a family membership), and the *duration*.

**Functional dependencies:**

{membership\_id-->number\_person\_involved, duration}

*\*” membership\_id” is a superkey*

**Minimal cover:**

{membership\_id-->number\_person\_involved;

membership\_id--> duration}

**Subscribed**:

Subscribed is a relationship between the Membership and Customer entities, marked by an identifier (id) and additional attributes specifying the type of payment and the date of payment.

**Functional dependencies:**

{payment\_id-->type\_of\_payment, date\_of\_payment}

*\*” payment\_id” is a superkey*

**Minimal cover:**

{payment\_id-->type\_of\_payment;

payment\_id--> date\_of\_payment}

**Space**:

Space is a fundamental entity capturing the various areas within our gym, including Training Space, Lounge, Locker Room, and Office. It is characterized by attributes such as an identifier (id), capacity, last\_check\_date (indicating the latest inspection by a technician), and state\_of\_space (providing insights into the current condition of the space).

**Functional dependencies:**

{space\_id --> capacity, last\_check\_date, state\_of\_space}

*\*” space\_id” is a superkey*

**Minimal cover:**

{space\_id --> capacity;

space\_id --> last\_check\_date;

space\_id --> state\_of\_space}

**Locker\_room**:

Locker\_room is a specialized entity derived from the broader Space entity, representing a distinct type of space within the gym. Each Locker Room is equipped with lockers, some designated for general use and others available for rent. The attribute total\_rentable\_lockers denotes the total number of lockers available for rent in the locker room. Additionally, lockers\_available\_for\_rent keeps track of the currently available lockers that are open for rental.

**Functional dependencies:**

{space\_id --> total\_rentable\_lockers, rent\_price, lockers\_available\_for\_rent;

lockers\_available\_for\_rent --> rent\_price}

*\*” space\_id” is a superkey*

*\* “lockers\_available\_for\_rent --> rent\_price” is a local dependency representing a specific relationship within our gym system*

**Minimal cover:**

{space\_id --> total\_rentable\_lockers;

space\_id --> rent\_price;

space\_id --> lockers\_available\_for\_rent;

lockers\_available\_for\_rent --> rent\_price}

**Office:**

Office is a specialized entity derived from the overarching Space entity, representing a specific type of workspace within the gym. This entity captures key details related to administrative offices. The number\_of\_staff attribute indicates the count of administrators present in the office. Additionally, the office\_start\_time and office\_end\_time attributes specify the operating hours of the office, providing information about the start and end times for administrative activities.

**Functional dependencies:**

{space\_id --> number\_staff, office\_start\_time, office\_end\_time}

*\*”space\_id” is a superkey*

**Minimal cover:**

{space\_id --> number\_staff;

space\_id --> office\_start\_time:

Space\_id --> office\_end\_time}

**S\_session:**

S\_session is a dedicated entity in our gym database, serving to represent fixed sessions that occur regularly. The sessions follow a consistent schedule, maintaining the same structure each week. This entity is characterized by essential attributes, including an ID for identification, the day on which the session occurs, and the specific start and end times.

**Functional dependencies:**

{session\_id--> s\_day, start\_time, end\_time;

s\_day, start\_time --> end\_time}

*\*” session\_id”” is a superkey*

*\* “s\_day, start\_time --> end\_time “is a contextual dependency capturing a specific association within our gym environment.*

**Minimal cover:**

{session\_id --> s\_day,

session\_id --> start\_time,

session\_id --> end\_time;

s\_day, start\_time --> end\_time}

**Customer:**

Customer is a fundamental entity within our gym database, encapsulating information about all our valued customers. The entity includes essential attributes such as the customer's name, contact details, birth date, and registration date, signifying the moment when the customer officially joined our gym community.

**Functional dependencies:**

{customer\_id --> c\_name, registration\_date, birth\_date, contact}

*\*” customer\_id” is a superkey*

**Minimal cover:**

{customer\_id --> c\_name;

customer\_id --> registration\_date ;

customer\_id --> birth\_date ;

customer\_id --> contact}

**Discipline:**

Discipline is a category in our gym database that represents different sports like swimming or boxing. It's important to note that discipline is separate from membership, where one membership can include several disciplines. The main details for discipline include an ID, name, and the minimum age a customer needs to join a session for that sport.

**Functional dependencies:**

{discipline\_id --> price, minimum\_age, d\_name;

d\_name --> minimum\_age}

*\*” discipline\_id” is a superkey*

*\*” d\_name --> minimum\_age” is a targeted dependency reflecting a specific interdependence within our gym layout.*

**Minimal cover:**

{ discipline\_id --> price ;

discipline\_id --> minimum\_age

discipline\_id --> d\_name;

d\_name --> minimum\_age}

**Employee**:

Employee is a category in our gym database that includes all staff members, such as trainers, admins, and technicians. The essential details for employees comprise an ID, name, contact information, salary, and the date they started working.

**Functional dependencies:**

{employee\_id --> first\_day\_work , e\_name, salary, contact}

*\*” employee\_id” is a superkey*

**Minimal cover:**

{employee\_id --> first\_day\_work ;

employee\_id --> e\_name;

employee\_id --> salary;

employee\_id --> contact}

**Feedback:**

Feedback is a feature in our gym system that allows customers to share their thoughts about the gym. These feedback entries are managed by an admin. The attributes of the Feedback entity include an ID, a title, and the text of the feedback.

**Functional dependencies:**

{feedback\_id --> f\_title , f\_text}

*\*” feedback\_id” is a superkey*

**Minimal cover:**

{feedback\_id --> f\_title ;

feedback\_id --> f\_text}

**Equipment**:

Equipment represents various pieces of gym equipment, each identified uniquely by a combination of barcode and equipment ID. This composite key is used because the same type of equipment from the same brand may have repeated barcodes. The attributes include type, brand, check interval days (indicating the frequency for equipment checks, which can vary), and last check date to monitor when the equipment was last inspected for compliance with the designated interval.

**Functional dependencies:**

{(equipment\_id , barcode) --> e\_type, brand, check\_interval\_days, last\_check\_date ;

barcode --> e\_type, brand;

e\_type, brand --> check\_interval\_days}

*\*” (equipment\_id, barcode) is a superkey*

*\* “barcode --> e\_type, brand” and “e\_type, brand --> check\_interval\_days” are targeted dependencies reflecting a specific interdependence within our gym layout.*

**Minimal cover:**

{(equipment\_id, barcode) --> brand ;

(equipment\_id, barcode) --> e\_type;

(equipment\_id, barcode) --> check\_interval\_days;

(equipment\_id, barcode) --> last\_check\_date;

barcode --> brand;

barcode --> e\_type;

e\_type, brand --> check\_interval\_days}