Department of Computer Engineering

BLG307 Veritabanı Yönetim Sistemleri
Project Report

GYM MANAGEMENT SYSTEM

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1 INTRODUCTION

1.1 PROJECT DESCRIPTION

This is a GYM Management System. It includes tables for members, equipment, employees, membership plans, trainers, classes, schedule, fees and payments, lockers and events.

- The database schema provides an overview of the gym management system, including the type of data that is stored in each table and the relationships between tables. The membership table contains information such as member id, name, email, membership type, contact number, and birthdate, while the equipment table contains information about the gym's equipment such as equipment id, brand, type, and condition.

- The employees table includes data about the gym's staff, like employee id, name, birthdate, contact number, and salary. The membership plans table includes data about the different membership plans offered by the gym, such as plan id, name, duration, and price. The trainers table includes information about the gym's trainers, like trainer id, name, gender, experience, certifications and email. The classes table includes information about the classes offered by the gym, like class id, name, trainer id, and duration. The schedule table includes information about the schedule of classes, like schedule id, class id, and date.

- In addition, there is tables for fees and payments, lockers, and events that keep track of financial transactions, locker assignments and any events held at the gym respectively. With all these tables, the database allows to easily manage and access information about members, equipment, employees, membership plans, trainers, classes, schedule, fees and payments, lockers and events.

SAMPLE

2 ENTITY RELATIONAL MODEL

2.1 ENHANCED ER DIAGRAM

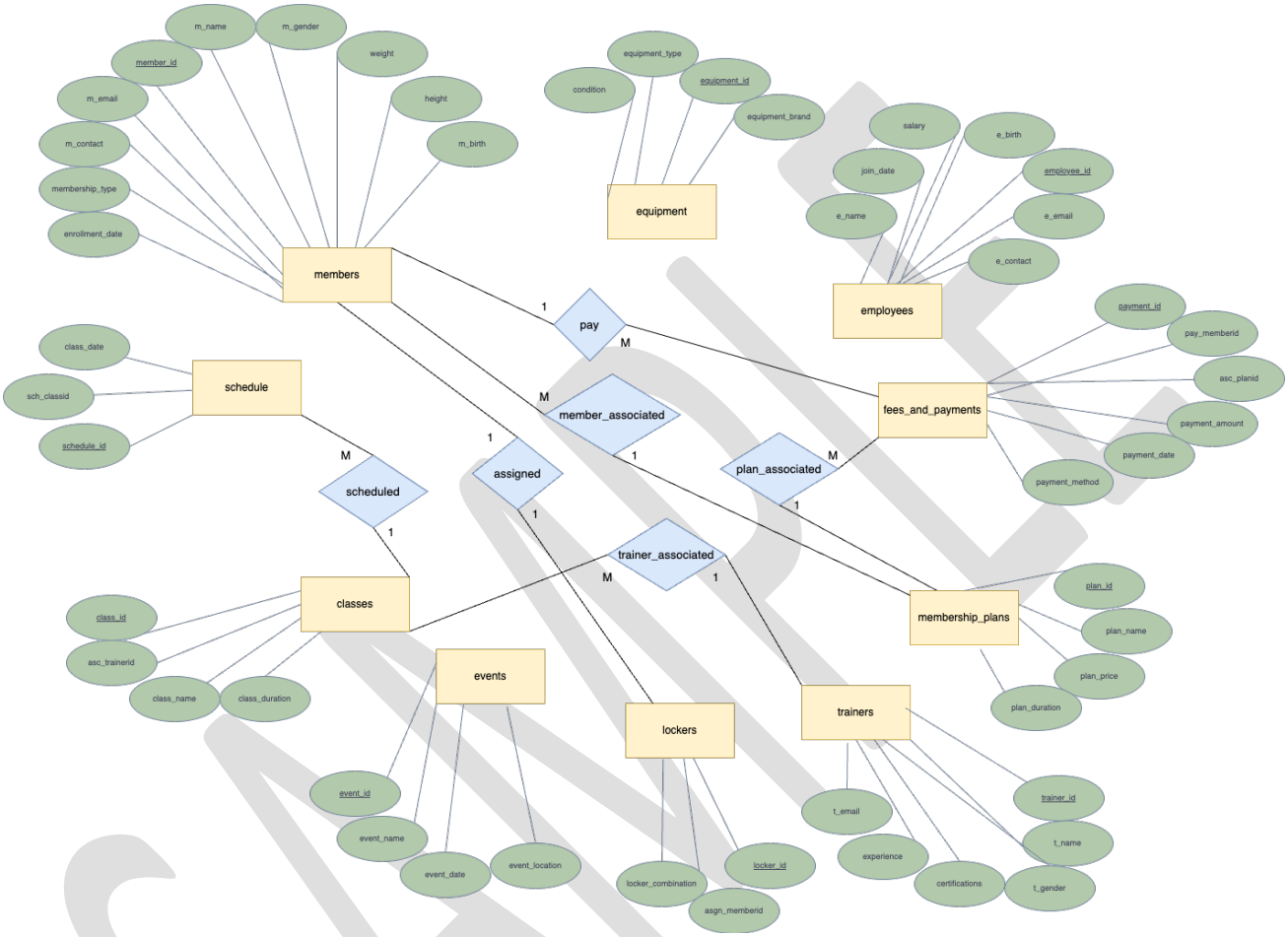

Figure 1: EER diagram of the GYM Management System Database

2.2 RELATIONAL SCHEMA & MAPPING

MEMBERS

member_id	m_birth	height	weight	m_gender	m_name	m_email	m_contact	membership_type	emrollment_date

LOCKERS

locker_id	locker_combination

FEES_AND_PAYMENTS

payment_id	payment_amount	payment_date	payment_method

MEMBERSHIP_PLANS

plan_id	plan_name	plan_price	plan_duration

TRAINERS

trainer_id	t_name	t_gender	experience	t_email	certifications

CLASSES

class_id	class_name	class_duration

SCHEDULES

schedule_id	class_date

EMPLOYEES

employee_id	e_name	e_email	e_contact	e_birth	salary	join_date

EQUIPMENT

equipment_id	condition	equipment_type	equipment_brand

EVENTS

event_id	event_name	event_location	event_date

Figure 2: Step 1 of mapping

SAMPLE

MEMBERS

member_id	m_birth	height	weight	m_gender	m_name	m_email	m_contact	membership_type	emrollment_date

LOCKERS

locker_id	locker_combination

FEES_AND_PAYMENTS

payment_id	payment_amount	payment_date	payment_method

MEMBERSHIP_PLANS

plan_id	plan_name	plan_price	plan_duration

TRAINERS

trainer_id	t_name	t_gender	experience	t_email	certifications

CLASSES

class_id	class_name	class_duration

SCHEDULES

schedule_id	class_date

EMPLOYEES

employee_id	e_name	e_email	e_contact	e_birth	salary	join_date

EQUIPMENT

equipment_id	condition	equipment_type	equipment_brand

EVENTS

event_id	event_name	event_location	event_date

Figure 3: Step 2 of mapping

SAMPLE

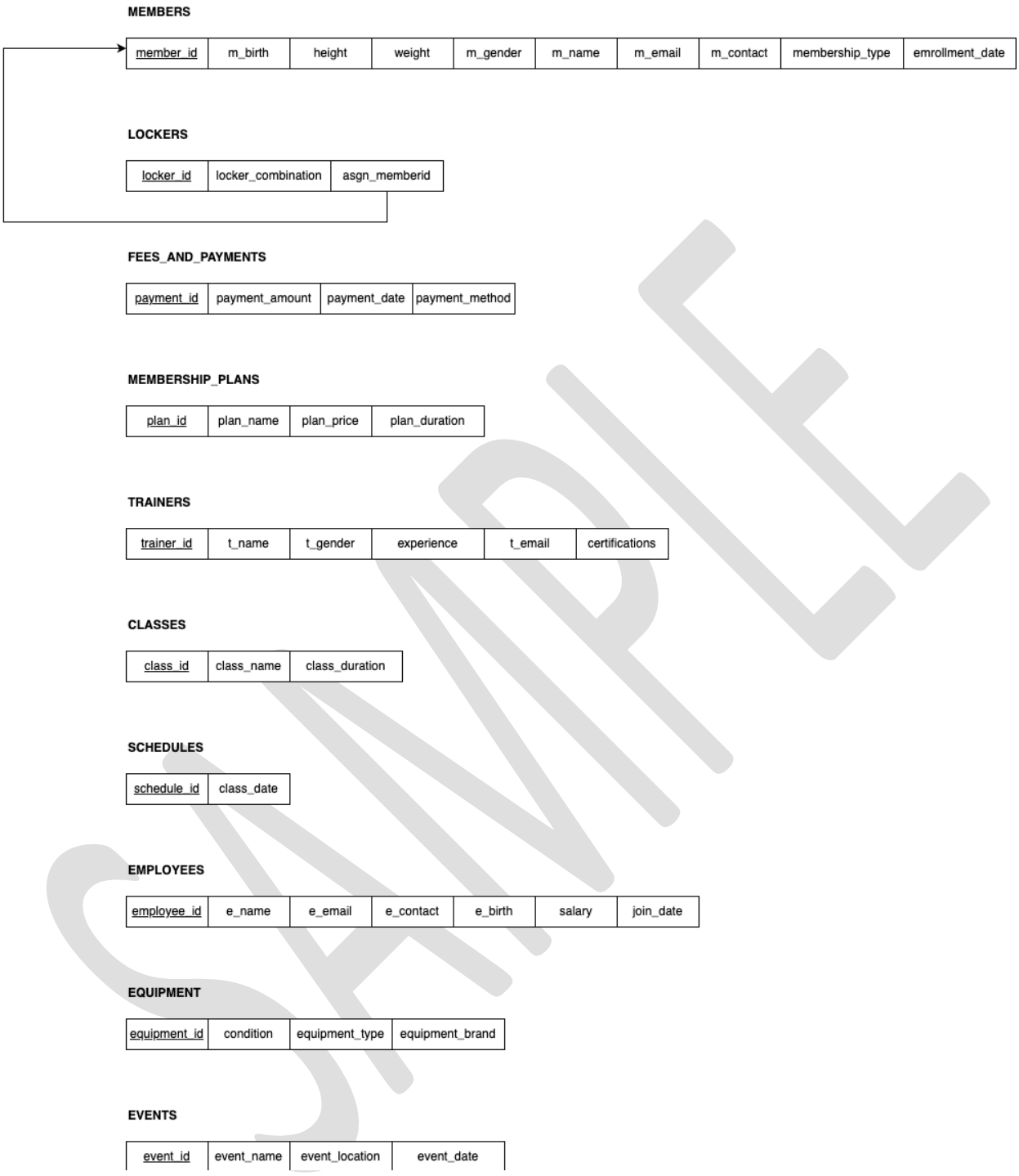

Figure 4: Step 3 of mapping

SAMPLE

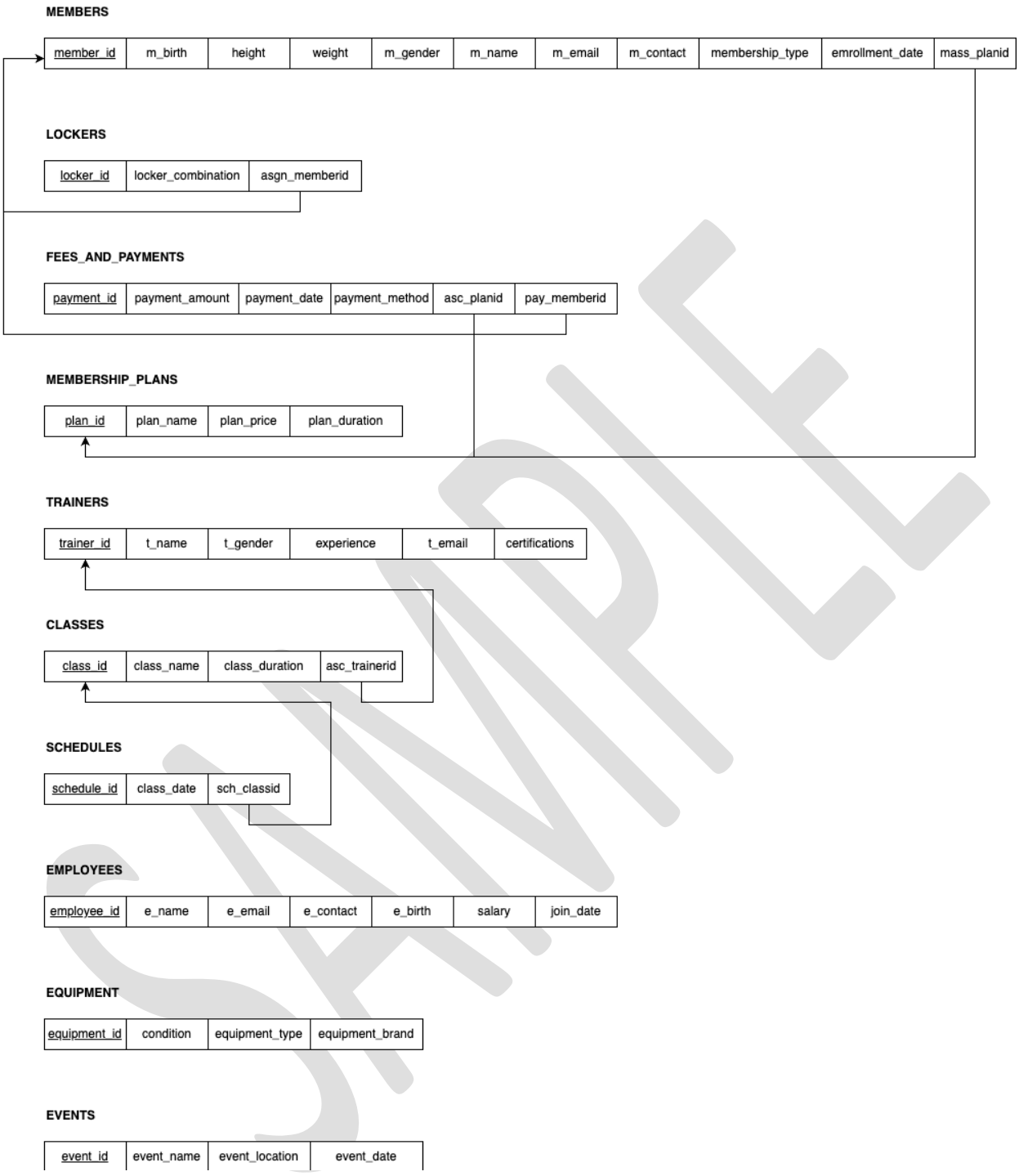

Figure 5: Step 4 of mapping

SAMPLE

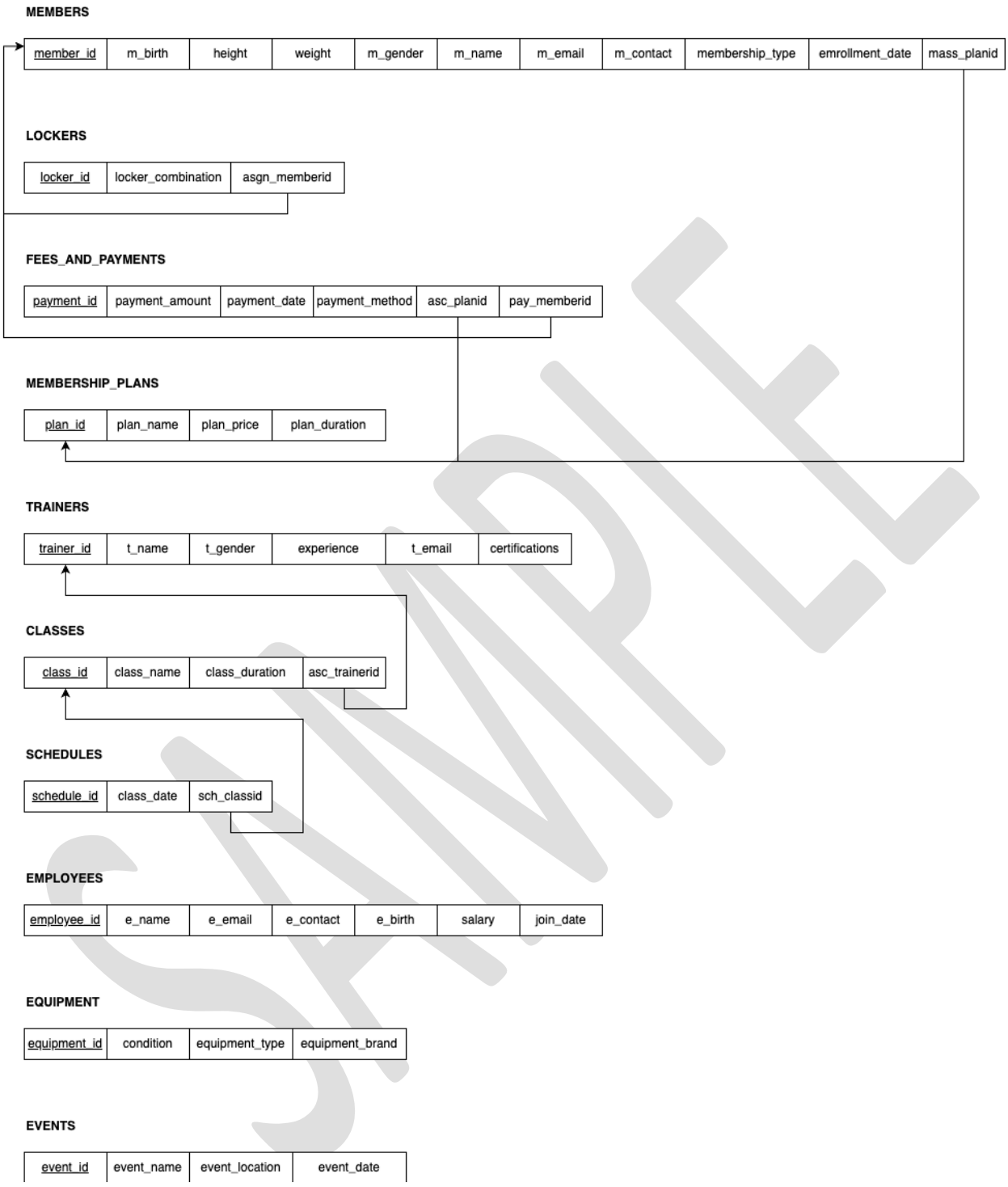

Figure 6: Step 5 of mapping

SAMPLE

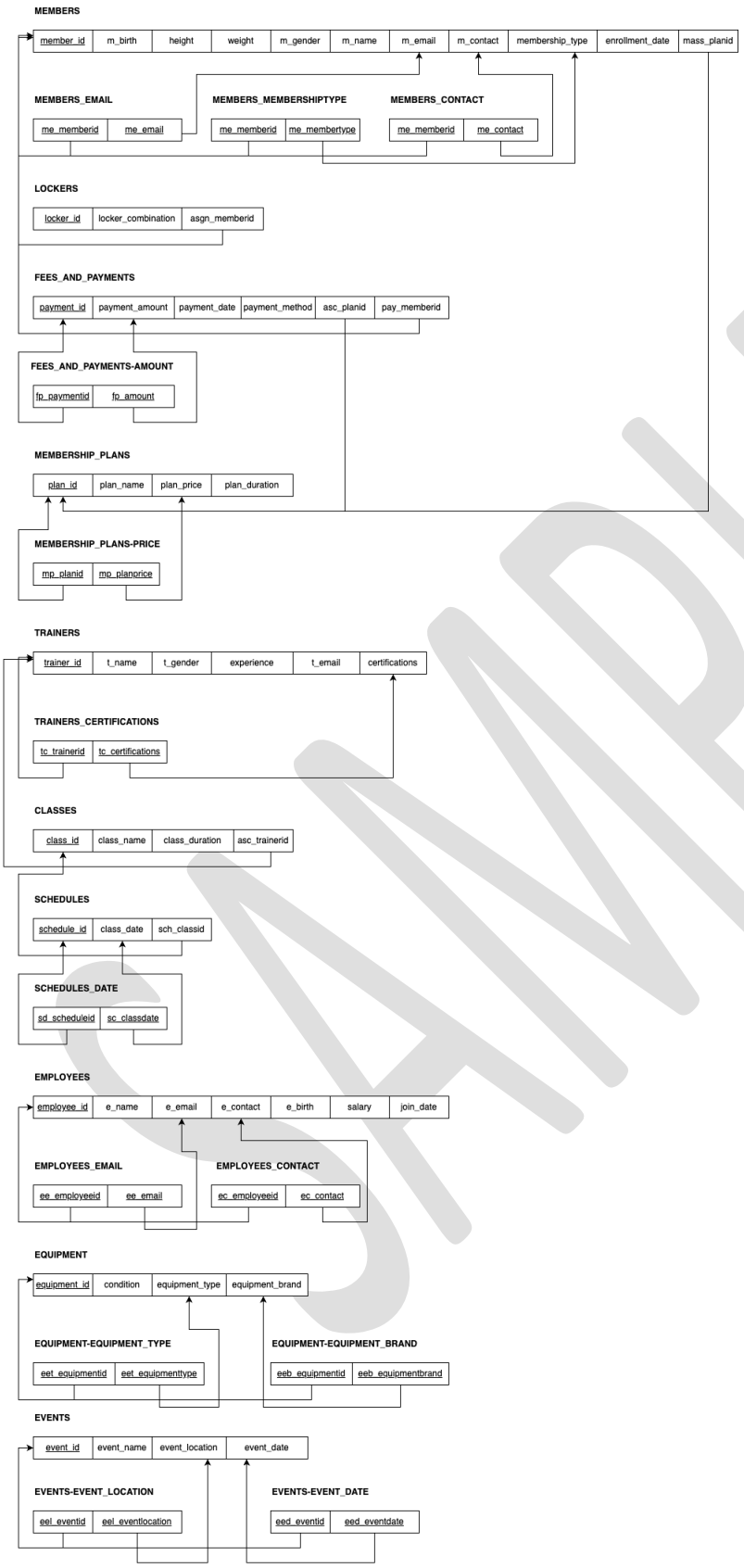

Figure 7: Step 6 of mapping

SAMPLE

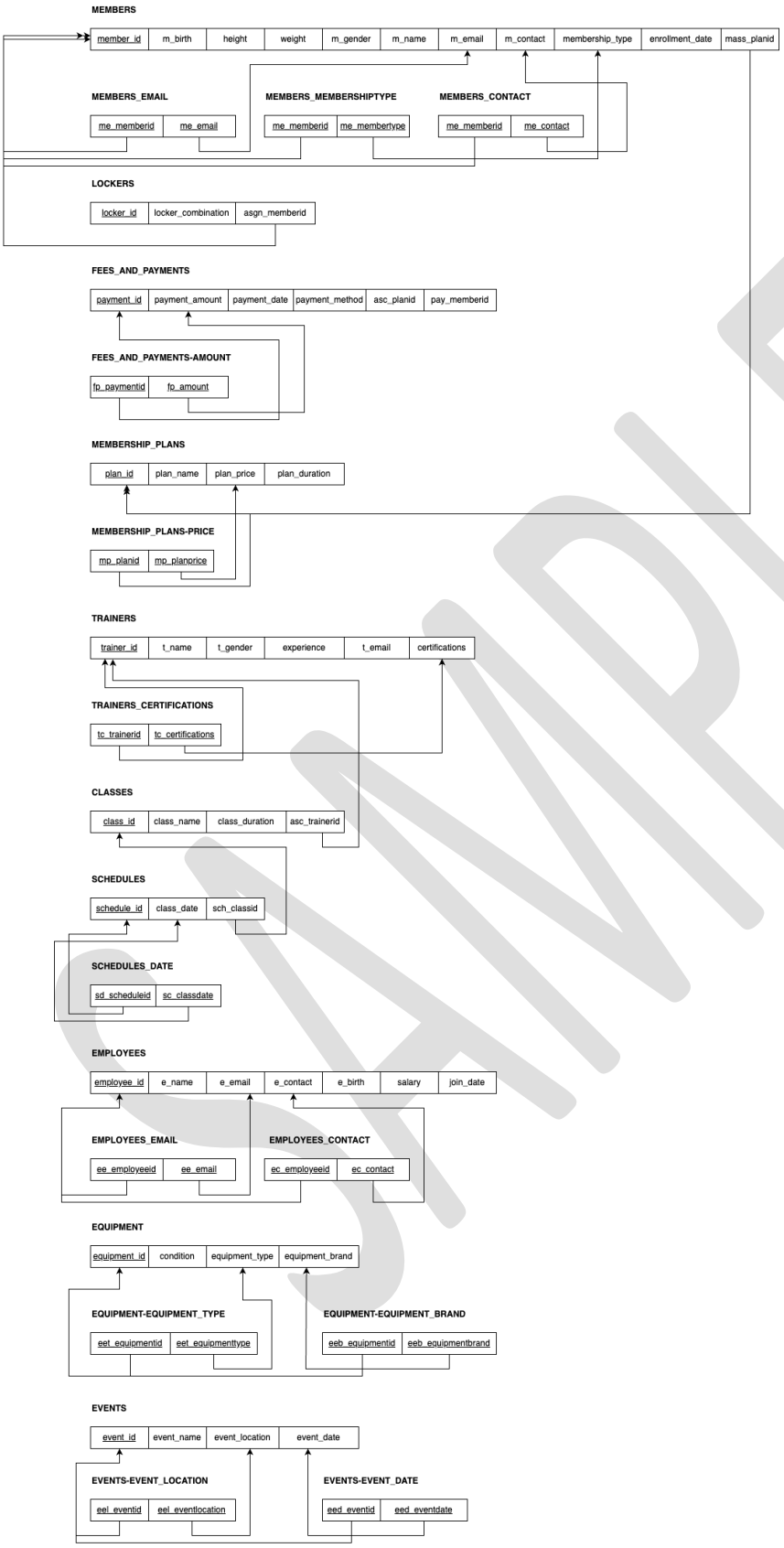

Figure 8: Step 7 of mapping

3 NORMALIZATION

3.1 FUNCTIONAL DEPENDENCIES

F = { FD1: member_id -> m_name, m_email, membership_type, m_contact, m_gender, m_birth, height, weight, enrollment_date

FD2: equipment_id -> equipment_brand, equipment_type, condition
FD3: DNAME → DNAME, DNUMBER, MGRSSN, MGRSTARTDATE

FD4: employee_id -> e_name, e_email, e_gender, e_birth, e_contact, salary, join_date

FD5: plan_id -> plan_name, plan_duration, plan_price

FD6: trainer_id -> t_name, t_gender, experience, certifications, t_email
FD7: ESSN, PNO → ESSN, PNO, HOURSSPENT

FD8: class_id -> class_name, asc_trainerid, class_duration

FD9: schedule_id -> sch_classid, class_date

FD10: payment_id -> pay_memberid, asc_planid, payment_amount, payment_date, payment_method

FD11: locker_id -> asgn_memberid, locker_combination

FD12: event_id -> event_name, event_date, event_location

3.2 UNNORMALISED FORM

For this, what we should do is to collect all attributes in the same entity.

SAMPLE

```sql
CREATE TABLE gym_unnormalized (
member_id INT,
m_name VARCHAR(255),
m_email VARCHAR(255),
membership_type VARCHAR(255),
m_contact INT,
m_gender VARCHAR(255),
m_birth INT,
height FLOAT,
weight FLOAT,
enrollment_date DATE,
equipment_id INT,
equipment_brand VARCHAR(255),
equipment_type VARCHAR(255),
condition VARCHAR(255),
employee_id INT,
e_name VARCHAR(255),
e_email VARCHAR(255),
e_gender VARCHAR(255),
e_birth DATE,
e_contact INT,
salary FLOAT,
join_date DATE,
plan_id INT,
plan_name VARCHAR(255),
plan_duration INT,
plan_price FLOAT,
trainer_id INT,
t_name VARCHAR(255),
t_gender VARCHAR(255),
experience INT,
certifications VARCHAR(255),
t_email VARCHAR(255),
class_id INT,
class_name VARCHAR(255),
asc_trainerid INT,
class_duration INT,
schedule_id INT,
sch_classid INT,
class_date DATE,
payment_id INT,
pay_memberid INT,
asc_planid INT,
payment_amount FLOAT,
payment_date DATE,
payment_method VARCHAR(255),
locker_id INT,
asgn_memberid INT,
locker_combination VARCHAR(255),
event_id INT,
event_name VARCHAR(255),
event_date DATE,
event_location VARCHAR(255)
);
```

3.3 FIRST NORMAL FORM

The database is already in 1NF form. Because:

- Each table has a primary key
- Each column in the table contains atomic (indivisible) values, meaning that the column cannot contain multiple values in one cell
- There is no repeating groups of columns, meaning that all data is represented in a single row

3.4 SECOND NORMAL FORM

MEMBERS

member_id	m_name	m_email	membership_type	mass_planid

MEMBER_DETAILS

m_birth	height	weight	m_gender	m_contact	enrollment_date

3.5 THIRD NORMAL FORM

MEMBERS

member_id	m_name	m_email	membership_type	mass_planid

MEMBER_DETAILS

m_birth	height	weight	m_gender	m_contact	enrollment_date

SCHEDULES

schedule_id	class_date	sch_classid

SCHEDULE_DETAILS

schedule_id	class_name	asc_trainerid	class_duration

FEES_AND_PAYMENTS

payment_id	pay_memberid	asc_planid	payment_amount	payment_date

PAYMENT_METHODS

payment_id	payment_method

SAMPLE

SAMPLE