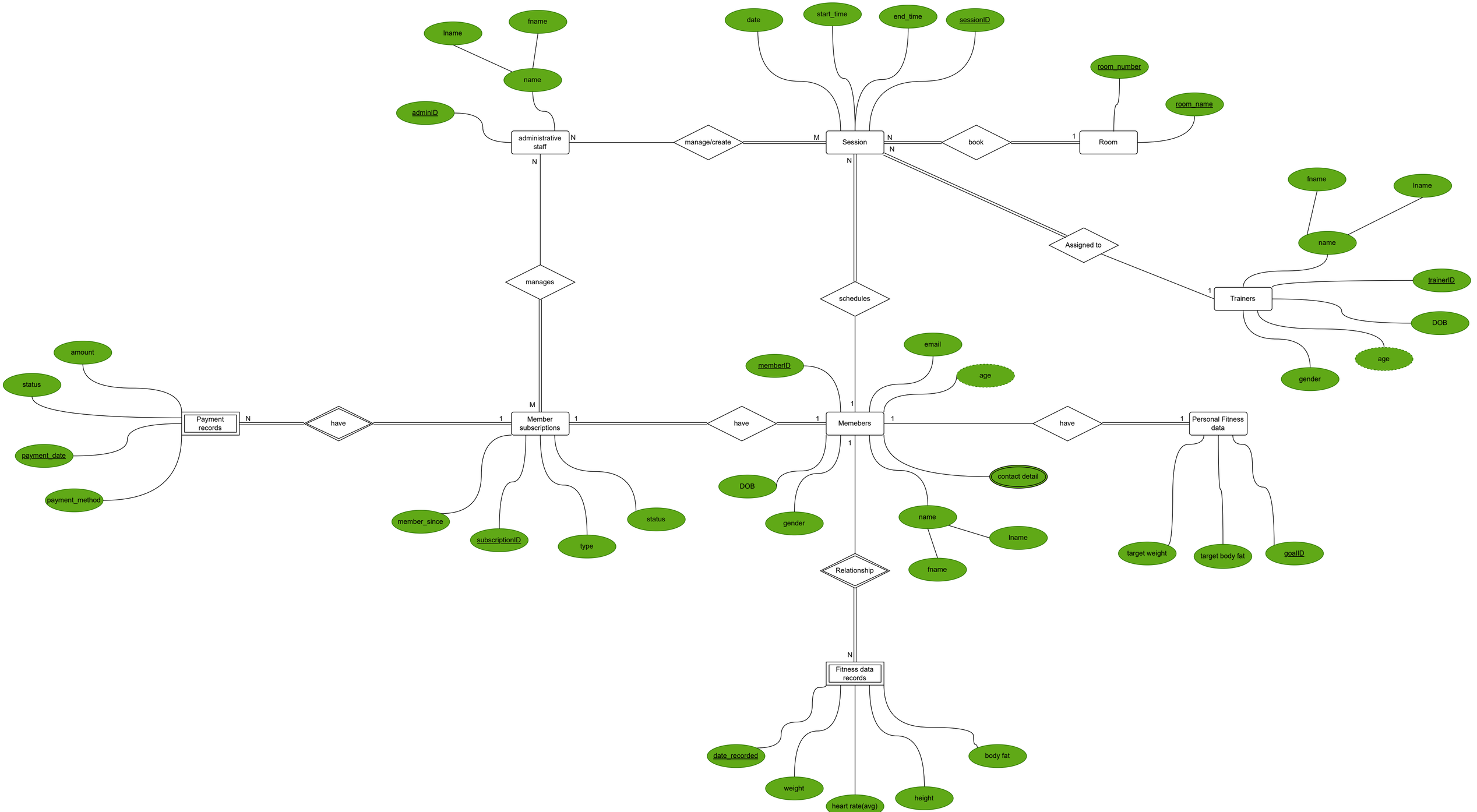
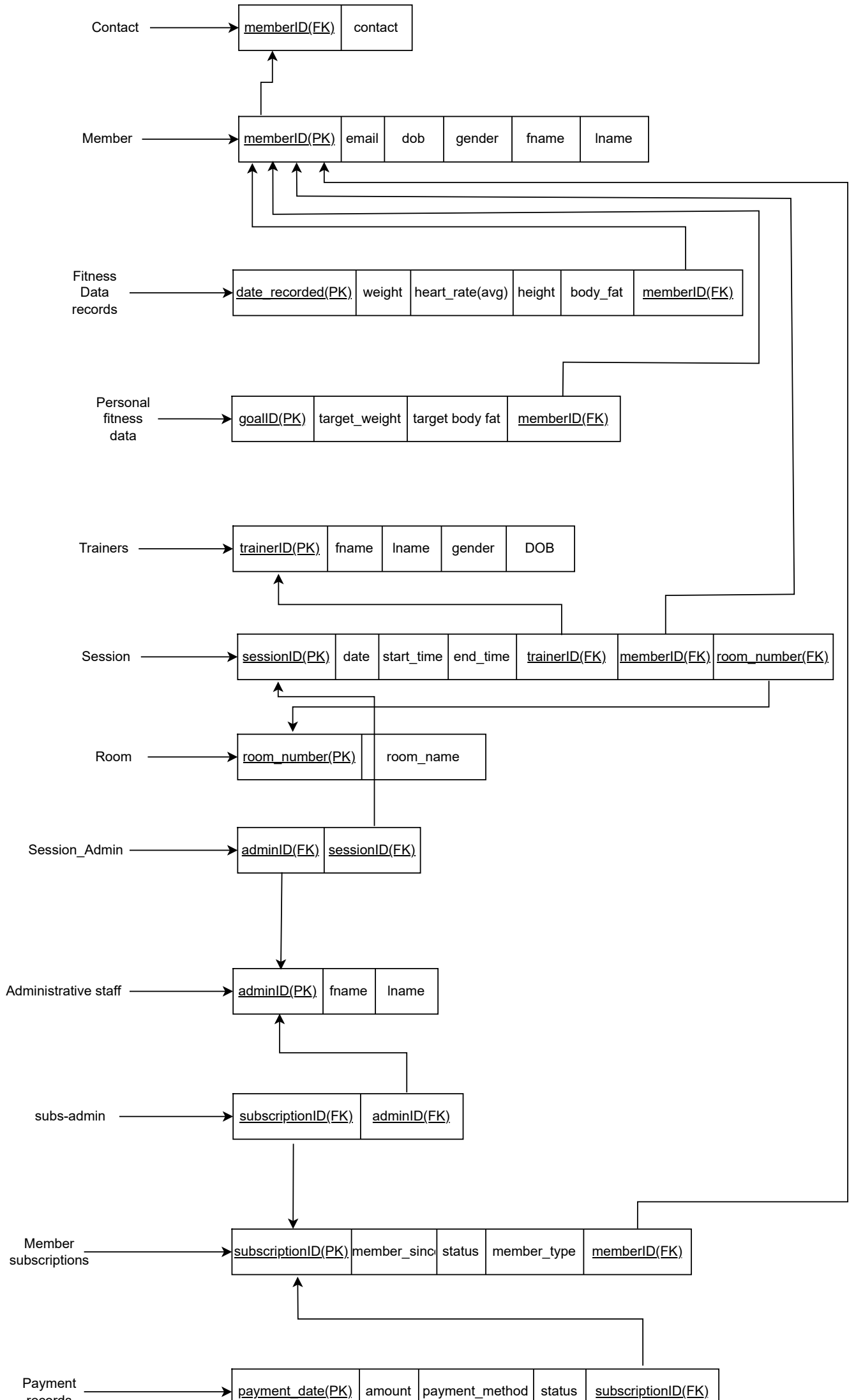

lname
fname
name
adminID
administrative staff
N
manage/create
M
Session
N
book
1
Room
room_number
room_name
date
start_time
end_time
sessionID
N
N
Assigned to
1
Trainers
fname
lname
name
trainerID
DOB
age
gender
N
manages
M
schedules
1
amount
status
payment_date
payment_method
Payment records
N
have
1
Member subscriptions
1
have
1
Memebers
1
have
1
Personal Fitness data
memberID
email
age
DOB
gender
name
lname
fname
contact detail
member_since
subscriptionID
type
status
target weight
target body fat
goalID
1
Relationship
N
Fitness data records
date_recorded
weight
heart rate(avg)
height
body fat


Contact
memberID(FK)
contact
Member
memberID(PK)
email
dob
gender
fname
lname
Fitness Data records
date_recorded(PK)
weight
heart_rate(avg)
height
body_fat
memberID(FK)
Personal fitness data
goalID(PK)
target_weight
target body fat
memberID(FK)
Trainers
trainerID(PK)
fname
lname
gender
DOB
Session
sessionID(PK)
date
start_time
end_time
trainerID(FK)
memberID(FK)
room_number(FK)
Room
room_number(PK)
room_name
Session_Admin
adminID(FK)
sessionID(FK)
Administrative staff
adminID(PK)
fname
lname
subs-admin
subscriptionID(FK)
adminID(FK)
Member subscriptions
subscriptionID(PK)
member_sinc
status
member_type
memberID(FK)
Payment records
payment_date(PK)
amount
payment_method
status
subscriptionID(FK)

Gazi Hossain - 101305532 - COMP3005 - Final Project

Checking for 2NF and 3NF

For 2NF - every non-primal attribute must be **fully dependent** on the entire primary key, so no **partial keys**

Example - table **Employee Project -**

primary keys - {SSN, PRnumber}

Non-primal attribute - {PRhours, Empl_name, Pname, PRlocation}

Functional dependencies -

FD1: {SSN, Pnumer} → PRhours

FD2: SSN → Empl_name

FD3: PRnumer} → {PRname, PRlocation}

Here, FD2 and FD3 are partial dependencies, so we have to create a new table for those two dependencies, so there will be 3 new tables(one for each dependency)

For 3NF- the table must be in 2NF form, and there must be no **transitive dependency**.

Example - table **Student's Courses -**

primary keys - {StudentID}

Non-primal attribute - {s_name, CourseID, c_name}

Functional dependencies -

FD1: StudentID → s_name

FD2: StudentID → CourseID

FD3: CourseID → c_name

Here, StudentID → CourseID → c_name is a transitive dependency, so we created a new table with FD3(with CourseID as primary key), just remove C_name from the original table.

Now, let's check for 2NF and 3NF from our mapping by checking each table. We have a total of 12 tables.

1. **Contact**
   - FD1:{memberID, contact} → {memberID, contact}
2. **Member**
   - FD1: MemberID → {email, dob, gender, fname, lname}
   - FD2: email →{MemberID, dob, gender, fname, lname}
3. **Fitness Data Records**
   - FD1: {date_recorded, memberID} → {height, weight, heart_rate(avg), body_fat}
4. **Personal Data records**
   - FD1: goalID → {MemberID, target_weight, target_body_fat}

5. **Trainers**
    - FD1: trainerID → {fname, lname, gender, DOB}
6. **Session**
    - FD1: sessionID → {date, start_time, end_time, trainerID, memberID, room_number}

7. **Room**
    - FD1: room_number → room_name

8. **Administrative staff**
    - FD1: adminID → {fname, lname}

9. **Session-admin**
    - FD1: sessionID → adminID

10. **Member subscription**
    - FD1: subscriptionID → {memberID, member_since, status, member_type}

11. **Subs-admin**
    - FD1: subscriptionID → adminID

12. **Payment records**
    - FD1: {payment_date, subscriptionID} → {amount, payment_method, status}

- All tables are in 2NF and 3NF.