



Group no. : 07

Lab group : 05

Group Representative :-

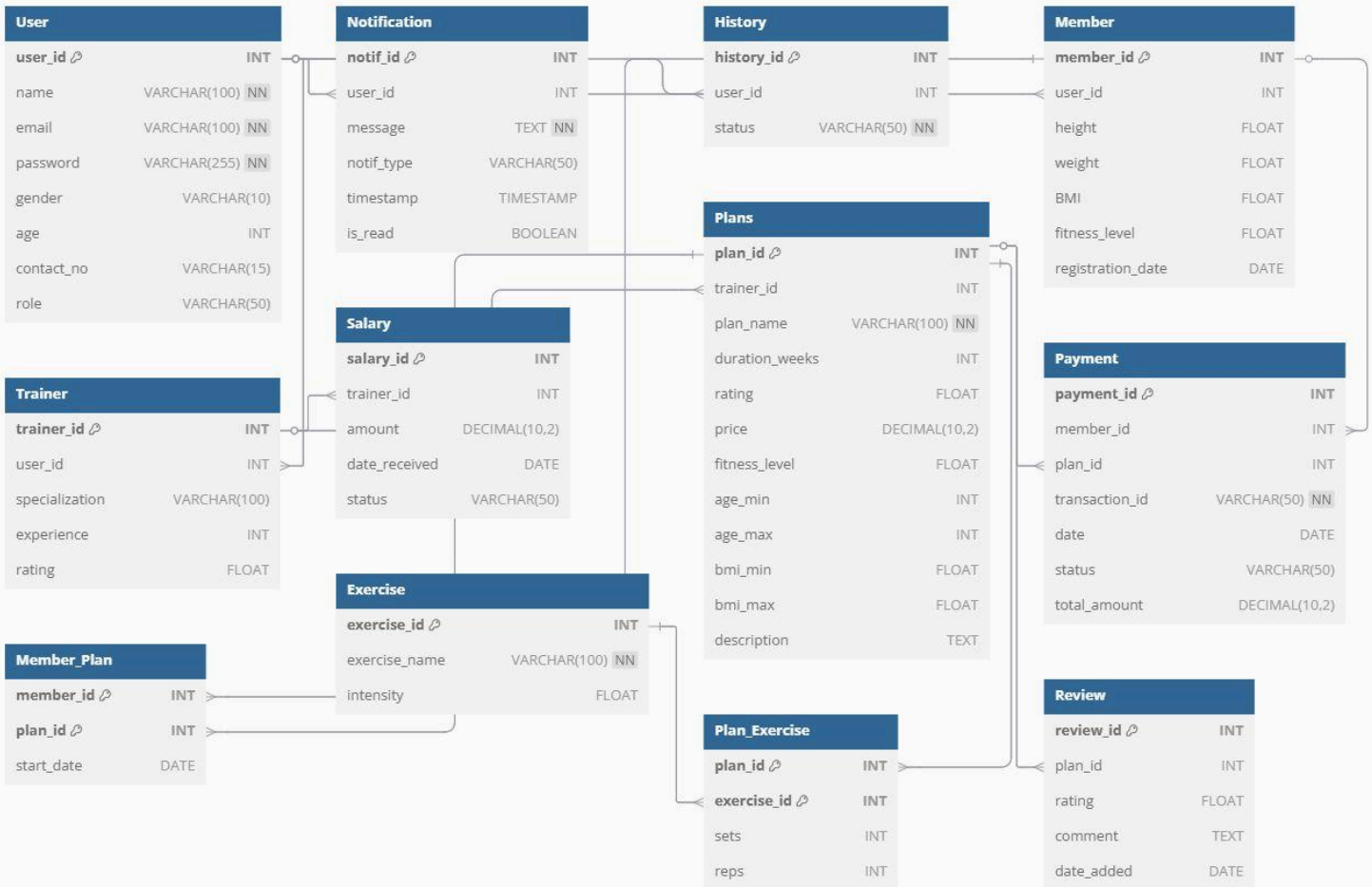
Ashka Pathak - 202301270

Contact no - +91 88798 29862

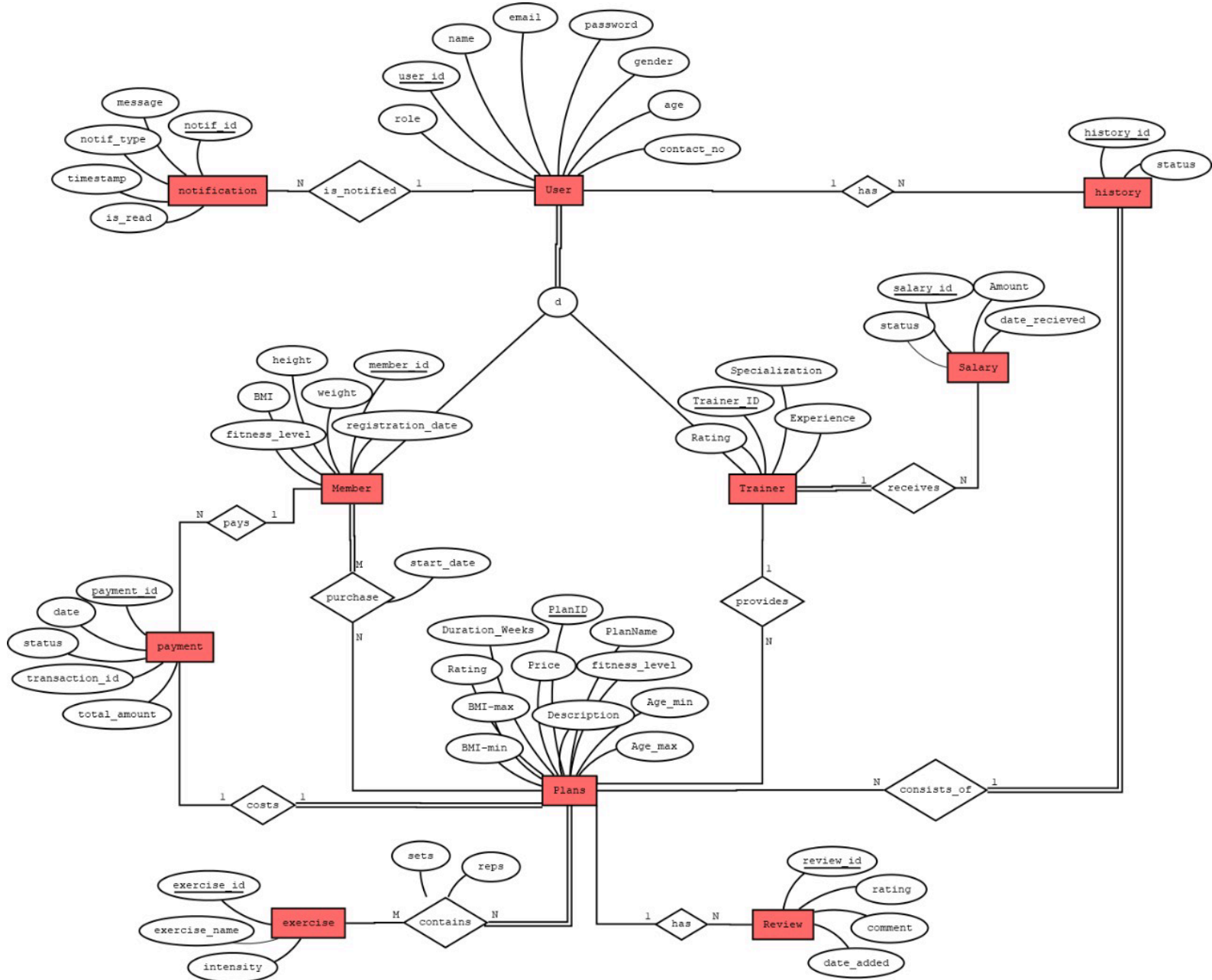
Team Members:-

1. Ashka Pathak - 202301270
2. Jill Chhagnani - 202301273
3. Dhruvi Jobanputra - 202301401
4. Visha Sitapara - 202301414
5. Dhyey Patel - 202301415

## Relational Schema



## ER Diagram



## Proof that relations are in BCNF

A relation R is in Boyce-Codd Normal Form, when determinant of every FD that holds on R, is super-key# of R. In other words, For every FD  $A \rightarrow B$  that holds on relation R, A is its super-key.

1. User Table:

- FDs:  $\text{user\_id} \rightarrow \text{name, email, password, gender, age, contact\_no, role}$ 
  - $\text{user\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

2. Notification Table:

- FDs:  $\text{notif\_id} \rightarrow \text{user\_id, message, notif\_type, timestamp, is\_read}$ 
  - $\text{notif\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

3. History Table:

- FDs:  $\text{history\_id} \rightarrow \text{user\_id, status}$ 
  - $\text{history\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

4. Member Table:

- FDs:  $\text{member\_id} \rightarrow \text{user\_id, height, weight, BMI, fitness\_level, registration\_date}$ 
  - $\text{member\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

5. Trainer Table:

- FDs:  $\text{trainer\_id} \rightarrow \text{user\_id, specialization, experience, rating}$ 
  - $\text{trainer\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

6. Salary Table:

- FDs:  $\text{salary\_id} \rightarrow \text{trainer\_id, amount, date\_received, status}$ 
  - $\text{salary\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

7. Plans Table:

- FDs:  $\text{plan\_id} \rightarrow \text{trainer\_id, plan\_name, duration\_weeks, rating, price, fitness\_level, age\_min, age\_max, bmi\_min, bmi\_max, description}$ 
  - $\text{plan\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

8. Payment Table:

- FDs:  $\text{payment\_id} \rightarrow \text{member\_id, plan\_id, transaction\_id, date, status, total\_amount}$ 
  - $\text{payment\_id}$  is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

9. Member\_Plan Table:

- FDs:  $\text{member\_id, plan\_id} \rightarrow \text{start\_date}$ 
  - $\text{member\_id, plan\_id}$  is the composite primary key.

- Conclusion: This relation is in BCNF because the composite primary key (member\_id, plan\_id) uniquely determines start\_date, and there are no partial dependencies or violations of BCNF.

10. Exercise Table:

- FDs: exercise\_id → exercise\_name, intensity
  - exercise\_id is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

11. Plan\_Exercise Table:

- FDs: plan\_id, exercise\_id → sets, reps
  - plan\_id, exercise\_id is the composite primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF because the composite primary key (plan\_id, exercise\_id) uniquely determines sets and reps.

12. Review Table:

- FDs: review\_id → plan\_id, rating, comment, date\_added
  - review\_id is the primary key, and all non-key attributes depend on it.
  - Conclusion: This relation is in BCNF.

All the relations in your schema satisfy the conditions for BCNF because, in every case, the left-hand side of each functional dependency either constitutes the primary key or is a superkey.