Social Networking System

DBMS Assignment 1

Kartika Nair (PES1UG19CS213)

Krithika Ragothaman (PES1UG19CS231)

Maitreyi P (PES1UG19CS254)

Database Management Systems (UE19CS301)

27 September 2021

Contents

1 Problem Statement **2**
1.1 Theoretical Explanation 2
1.2 Constraints 5

2 Conceptual Model of Database Design **7**

3 ER Tool Usage **14**

4 Final Diagram **16**

5 Contributions **17**

Chapter 1

Problem Statement

The problem statement that has been selected for this assignment is a Social Networking System. This essentially refers to a platform where users can connect and interact with each other. Popular Social Networking Systems include Instagram, Twitter, Facebook, and more.

1.1 Theoretical Explanation

The following eight entities have been included in the Entity–Relationship (ER) model constructed for the aforementioned system,

- User
- User Home
- Friends
- Fleets
- Posts
- Post Likes
- Replies
- Reply Likes

The 'User' entity is a strong entity which contains user information in the attributes,

- Username
- Name
- Email ID
- Age
- Date of Birth

The 'Username' attribute is the primary key for this entity. Additionally, the 'Name' attribute is a composite attribute consisting of 'First Name' and 'Last Name'.

The 'User Home' entity is a weak entity which holds additional, non-essential user profile information with attributes such as,

- Bio
- Education
- Location
- Work
- Link

The 'Education' attribute is a composite attribute with school and college information, while the 'Location' attribute consists of 'City' and 'Country'. This entity has no primary key.

The 'Friends' entity is a strong entity which contains information about a user's friends and friend network. Note that a user's friends are also separate users. The attributes include,

- Friend ID
- Name
- Email ID
- Follow Status

The 'Friend ID' attribute is the primary key for this entity, while the 'Follow Status' attribute indicates if a user "follows" their friends, and vice versa.

The 'Fleets' entity is a strong entity holding information about the Fleets feature. The attributes for this entity consist of,

- Fleet ID
- Fleet Content
- Duration
- Fleet Time

The 'Fleet ID' attribute is the primary key for this entity.

The 'Posts' entity is a strong entity set to hold information about a user's posts, and has the following attributes,

- Post ID
- Post Content

The 'Post ID' attribute is the primary key for this entity.

The corresponding 'Post Likes' entity is a weak entity which holds information about the likes received on a user's post. The attributes for this entity include,

- Like ID
- Like Count

This entity has no primary key.

The 'Replies' entity is a weak entity which holds information about replies received to a user's posts. The attributes include,

- Reply ID
- Replier ID
- Reply Content

The primary key for this entity is a combination of the 'Reply ID' and 'Replier ID' attributes.

The corresponding 'Reply Likes' entity is a weak entity which holds information about the likes received on a user's reply to a post. This entity has a singular attribute,

- Like ID

This entity has no primary key.

1.2 Constraints

The following cardinalities have been applied to the relations within the diagram,

- User HAS Friend - 1:N
- Friend IS User - 1:1
- User HAS User Home - 1:1
- User CREATES Posts - 1:N
- User CREATES Fleets - 1:N
- Posts HAS Post Likes - 1:M
- Posts HAS Replies - 1:N
- Replies HAS Reply Likes - 1:N

The following participation constraints have been applied to the relations within the diagram,

- User HAS Friend
  - User - Partial
  - Friend - Partial
- Friend IS User
  - User - Total
  - Friend - Total
- User HAS User Home
  - User - Total
  - User Home - Total
- User CREATES Posts
  - User - Partial
  - Posts - Total
- User CREATES Fleets
  - User - Partial
  - Fleets - Total
- Posts HAS Post Likes
  - Posts - Partial
  - Post Likes - Total
- Posts HAS Replies
  - Posts - Partial
  - Replies - Total
- Replies HAS Reply Likes
  - Replies - Partial
  - Reply Likes - Partial

Chapter 2

Conceptual Model of Database Design

The following hand-drawn entities were initially constructed as the first step for the ER Diagram for this project, prior to being refined in order to fit the final ER Diagram,

- Friends

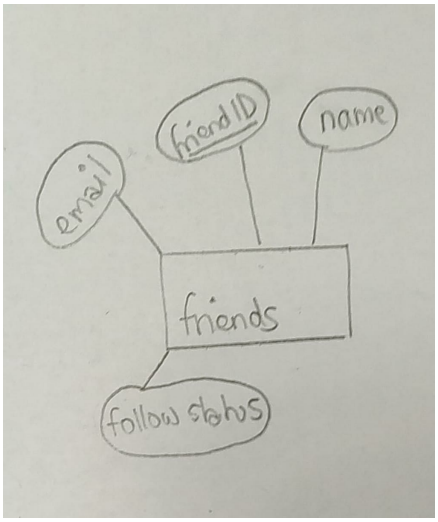

Figure 2.1: Initial hand-drawn version of 'Friends'.

- Posts

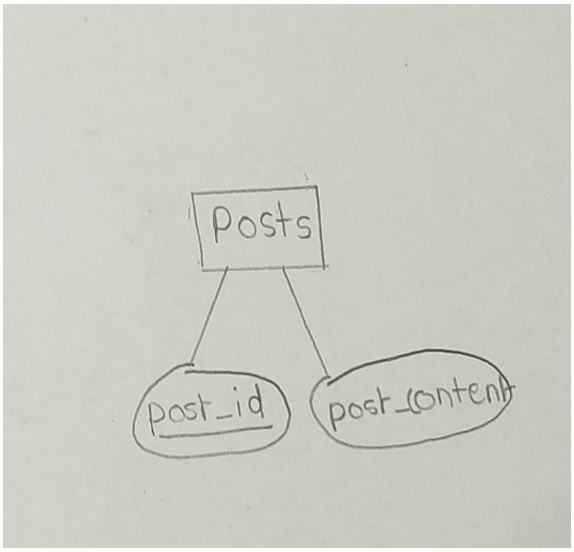

Figure 2.2: Initial hand-drawn version of 'Posts'.

- User

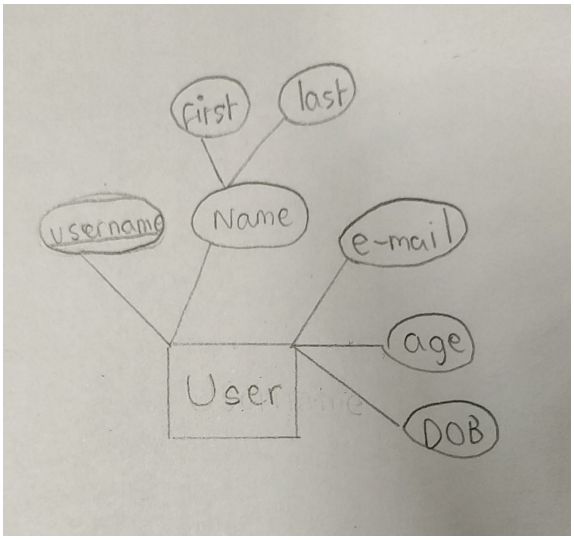

Figure 2.3: Initial hand-drawn version of 'User'.

The following entities were created later in the making of the ER Diagram,

- Fleets

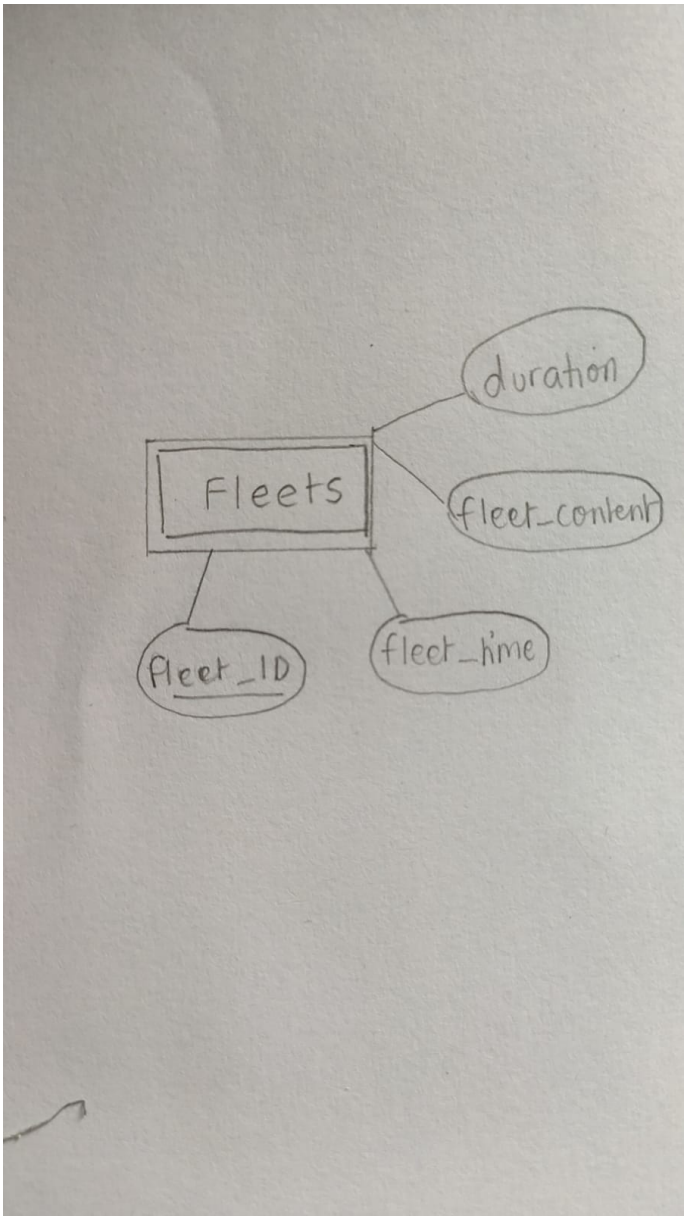

Figure 2.4: Initial hand-drawn version of 'Fleets'.

- Post Likes

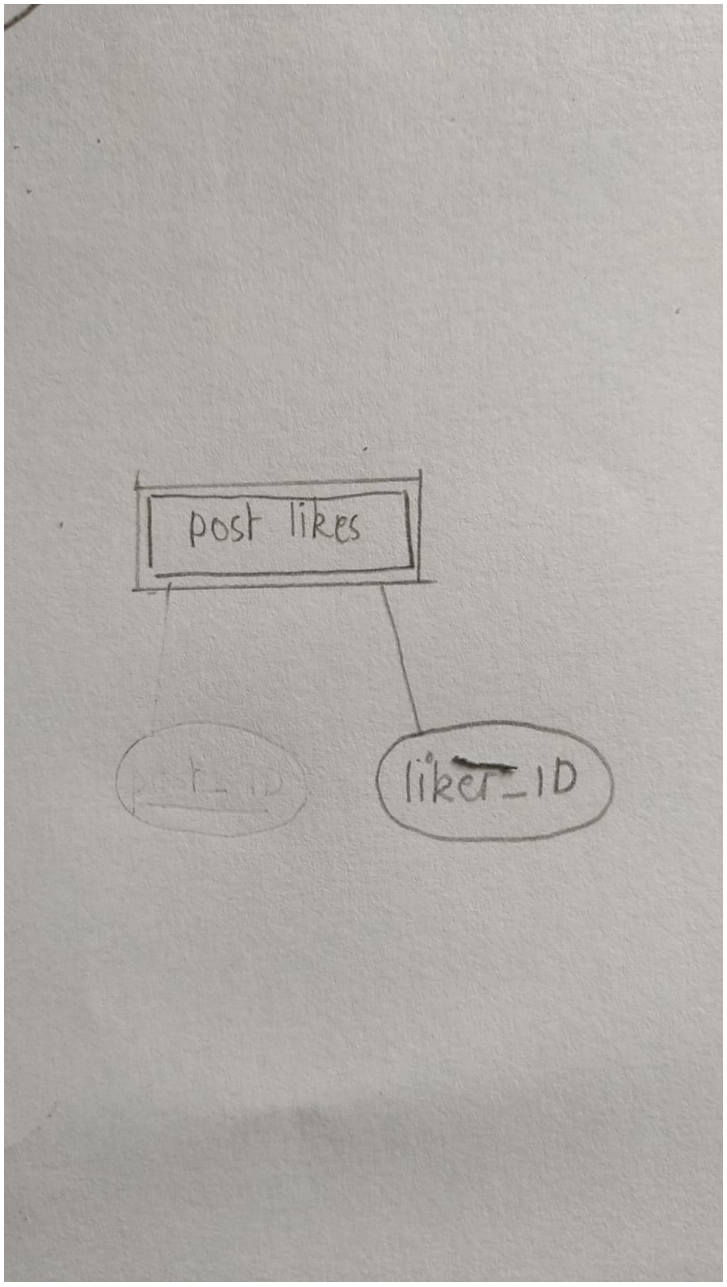

Figure 2.5: Initial hand-drawn version of 'Post Likes'.

- Replies and Reply Likes

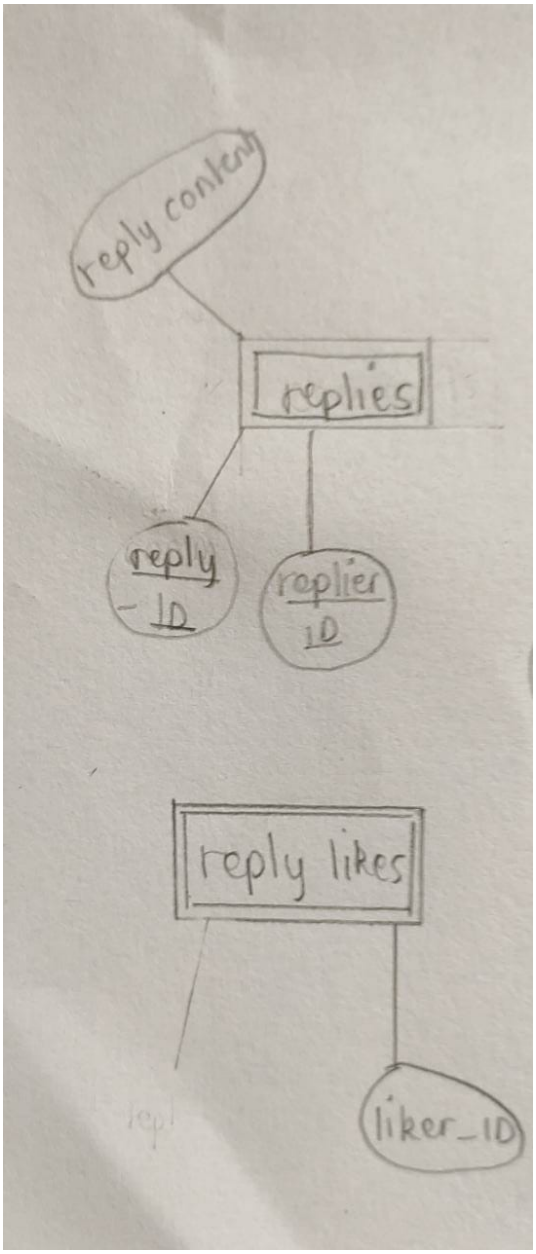

Figure 2.6: Initial hand-drawn version of 'Replies' and 'Reply Likes'.

The 'Posts' entity was later refined as seen in Figure 2.7.

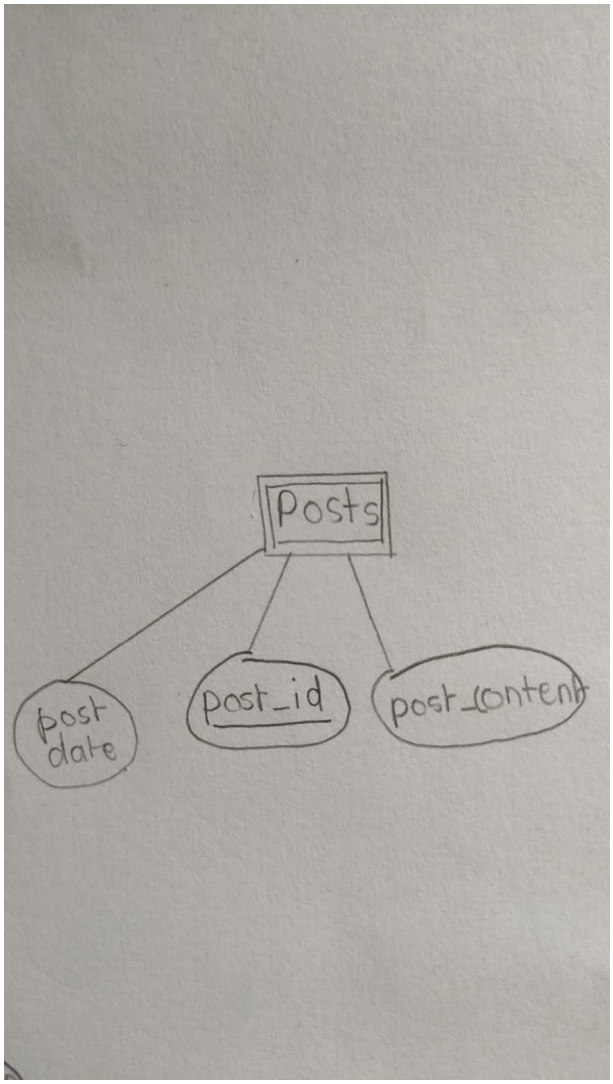

Figure 2.7: Refined 'Posts' entity.

The final hand-drawn ER Diagram can be seen in Figure 2.8.

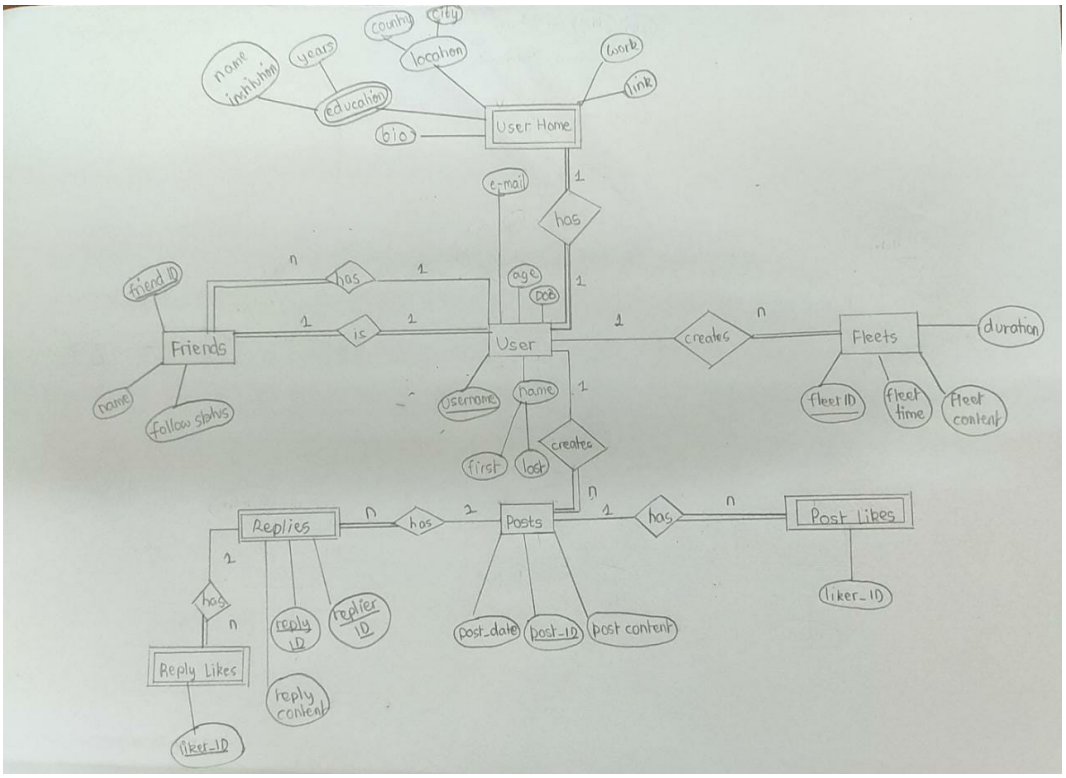

Figure 2.8: The final hand-drawn ER Diagram.

Chapter 3

ER Tool Usage

The platform used to create the ER Diagram for this assignment was Lucidchart, a web-based medium that can be utilised to create various types of charts and graphs. The unpaid version of Lucidchart that is available online was used to implement the Social Networking System ER Diagram. Note that this tool is not open-sourced, and has a paid version with premium features. For this project, the 'Line', 'Process', 'Terminator', and 'Decision' features were used, all of which are available for free.

The following entities, as derived from the initial hand-drawn variants, were constructed via Lucidchart as the second step for the ER Diagram for this project, and later refined,

- Friends

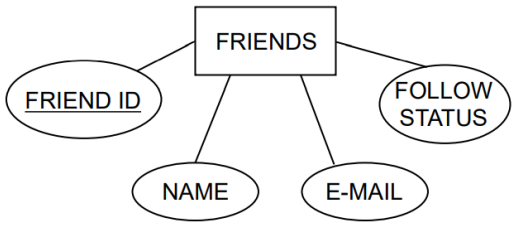

Figure 3.1: Initial tool-drawn version of 'Friends'.

- Posts

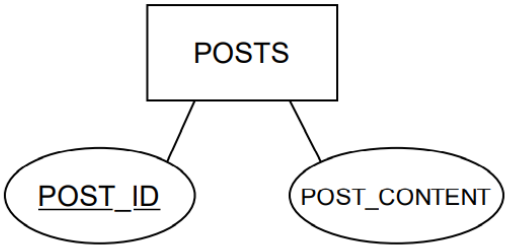

Figure 3.2: Initial tool-drawn version of 'Posts'.

- User

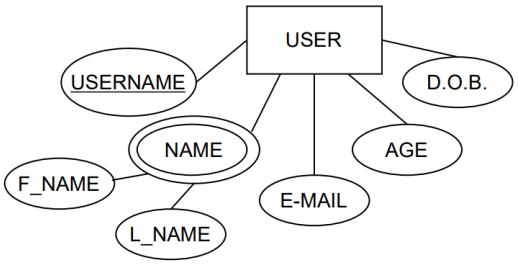

Figure 3.3: Initial tool-drawn version of 'User'.

The reason behind selecting Lucidchart to be used for creation of the ER Diagram in this project was owing to its comprehensible interface, ease of use, and practical export options. It can be found at the following URL,

https://www.lucidchart.com/pages/

Chapter 4

Final Diagram

The final ER Diagram for the Social Networking System that has been detailed so far can be seen in Figure 4.1.

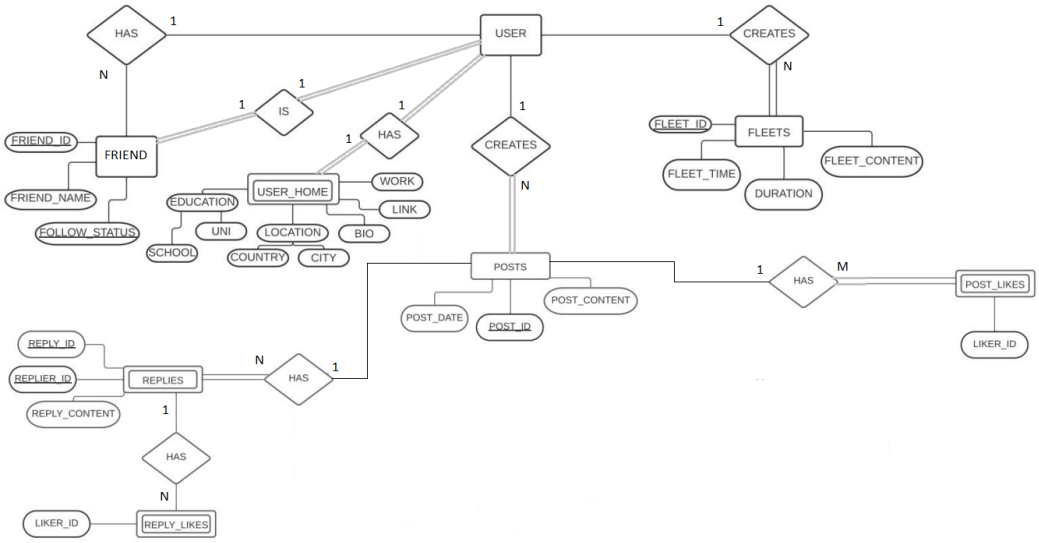

Figure 4.1: The final ER Diagram.

Chapter 5

Contributions

1. Kartika Nair - PES1UG19CS213
    - Problem Statement, ER Tool Usage, Report
    - Hours Spent - 3.5
2. Krithika Ragothaman - PES1UG19CS231
    - Conceptual Model of Database Design
    - Hours Spent - 3
3. Maitreyi P - PES1UG19CS254
    - Theoretical explanation of ER Diagram
    - Hours Spent - 2.5