Social Media Database Schema and Data Modeling

Documentation

1. Introduction

This document describes the design of the social media platform database, including table definitions, key fields, relationships, and an ER diagram for visual reference.

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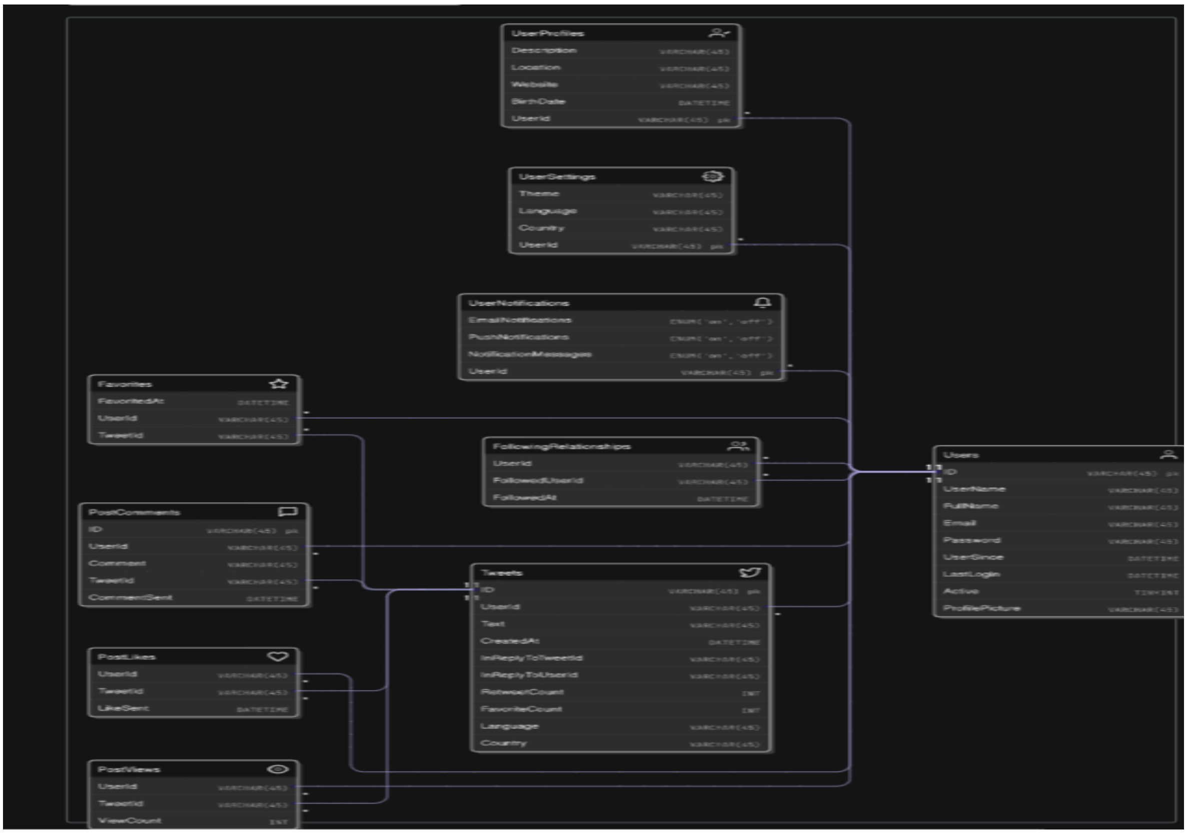
2. Entity Relationship Diagram

The following ER diagram visualizes the entire database and the relationships between all tables.



3. Table Descriptions

3.1 Users

Field	**Type**	**Description**
ID	VARCHAR(45)	Primary Key. Unique user ID
UserName	VARCHAR(45)	Unique username
FullName	VARCHAR(45)	User's full name
Email	VARCHAR(45)	Unique email
Password	VARCHAR(45)	Hashed password
UserSince	DATETIME	When the user joined
LastLogin	DATETIME	Last login timestamp

Active	TINYINT	Account status (active/inactive)
ProfilePicture	VARCHAR(45)	Profile image reference

3.2 UserProfiles

Field	**Type**	**Description**
UserId	VARCHAR(45)	FK to Users.ID (Primary Key)
Description	VARCHAR(45)	Short biography
Location	VARCHAR(45)	City or region
Website	VARCHAR(45)	Personal/professional URL
BirthDate	DATETIME	Date of birth

3.3 UserSettings

Field	Type	Description
UserId	VARCHAR(45)	FK to Users.ID (Primary Key)
Theme	VARCHAR(45)	Theme preference
Language	VARCHAR(45)	Preferred language
Country	VARCHAR(45)	User's country

3.4 UserNotifications

Field	Type	Description
UserId	VARCHAR(45)	FK to Users.ID (Primary Key)
EmailNotifications	ENUM('on','off')	Email notifications toggle
PushNotifications	ENUM('on','off')	Push notifications toggle

NotificationMessages	ENUM('on','off')	Messages notifications

3.5 Tweets

Field	Type	Description
ID	VARCHAR(45)	PK, unique tweet ID
Text	VARCHAR(45)	Tweet content
CreatedAt	DATETIME	Post time
UserId	VARCHAR(45)	FK to Users.ID
InReplyToTweetId	VARCHAR(45)	FK if it's a reply to a tweet
InReplyToUserId	VARCHAR(45)	FK if a reply to a user
RetweetCount	INT	Number of retweets
FavoriteCount	INT	Number of likes
Language	VARCHAR(45)	Tweet language

Country	VARCHAR(45)	Posting country/location

3.6 FollowingRelationships

Field	**Type**	**Description**
UserId	VARCHAR(45)	Follower ID, FK to Users.ID
FollowedUserId	VARCHAR(45)	Followee ID, FK to Users.ID
FollowedAt	DATETIME	When followed

3.7 Favorites

Field	**Type**	**Description**
UserId	VARCHAR(45)	FK to Users.ID
TweetId	VARCHAR(45)	FK to Tweets.ID

FavoritedAt	DATETIME	Timestamp of the like

3.8 PostComments

Field	Type	Description
ID	VARCHAR(45)	PK, unique comment ID
UserId	VARCHAR(45)	FK to Users.ID
TweetId	VARCHAR(45)	FK to Tweets.ID
Comment	VARCHAR(45)	Content of the comment
CommentSent	DATETIME	When posted

3.9 PostLikes

Field	Type	Description
UserId	VARCHAR(45)	FK to Users.ID
TweetId	VARCHAR(45)	FK to Tweets.ID

LikeSent	DATETIME	Timestamp of like

3.10 PostViews

Field	Type	Description
UserId	VARCHAR(45)	FK to Users.ID
TweetId	VARCHAR(45)	FK to Tweets.ID
ViewCount	INT	Number of times viewed

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4. Table Relationships

- UserProfiles.UserId → Users.ID
- UserSettings.UserId → Users.ID
- UserNotifications.UserId → Users.ID
- Tweets.UserId → Users.ID
- FollowingRelationships.UserId, FollowedUserId → Users.ID
- Favorites.UserId → Users.ID
- Favorites.TweetId → Tweets.ID
- PostComments.UserId → Users.ID
- PostComments.TweetId → Tweets.ID
- PostLikes.UserId → Users.ID
- PostLikes.TweetId → Tweets.ID
- PostViews.UserId → Users.ID
- PostViews.TweetId → Tweets.ID

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5. Notes

- All user-linked tables reference `Users.ID`, enforcing referential integrity.
- Use VARCHAR for IDs for flexibility; you may switch to INT/BIGINT for numeric keys in large deployments.
- Add indexes for foreign key fields for best performance.
- Diagram and schema are extendable for new features (e.g., messages, groups).

6. Transaction for User + Profile Creation

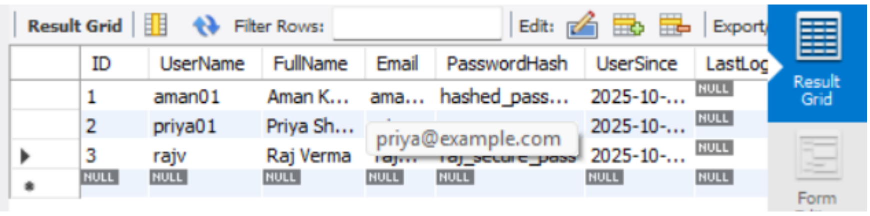
```
START TRANSACTION;

INSERT INTO `social_media`.`users` (`UserName`, `FullName`, `Email`, `PasswordHash`)
VALUES ('aman01', 'Aman Kharwar', 'aman@example.com', 'hashed_password');

SET @user_id = LAST_INSERT_ID();

INSERT INTO `social_media`.`user_profiles` (`UserId`, `Description`, `Location`, `Website`,
`BirthDate`)
VALUES (@user_id, 'Developer', 'Bangalore', 'https://aman.dev', '2001-02-21');

COMMIT;
```

7. Outputs

Used ACID Property to To implement tracation

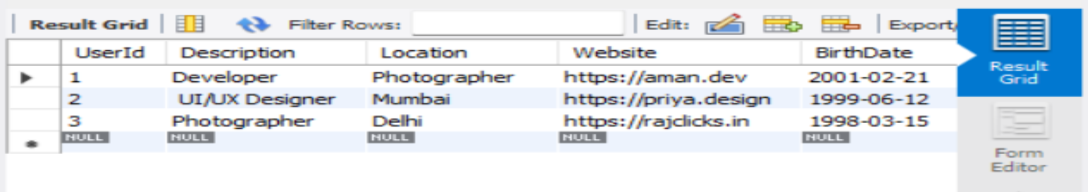
Query to Implement

Insert Data in User and Profile in one Transaction



	ID	UserName	FullName	Email	PasswordHash	UserSince	LastLog
	1	aman01	Aman K...	ama...	hashed_pass...	2025-10-...	NULL
	2	priya01	Priya Sh...	[illegible]	[illegible]	2025-10-...	NULL
▶	3	rajv	Raj Verma	raj...	raj_secure_pass	2025-10-...	NULL
✱	NULL	NULL	NULL	NULL	NULL	NULL	NULL

priya@example.com



UserId	Description	Location	Website	BirthDate
1	Developer	Photographer	https://aman.dev	2001-02-21
2	UI/UX Designer	Mumbai	https://priya.design	1999-06-12
3	Photographer	Delhi	https://rajclicks.in	1998-03-15
NULL	NULL	NULL	NULL	NULL

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