For Part1 : EER for Given Database

No. of Entities:

· USER_ACCOUNTS

· USER_ROLES

· PRIVILEGES

· ACCOUNT_PRIVELEGES

· RELATION_PRIVELEGES

. TABLES

There was no key assumption made by us. Except for the attributes of the entities privileges, account_privileges and relation_privileges.
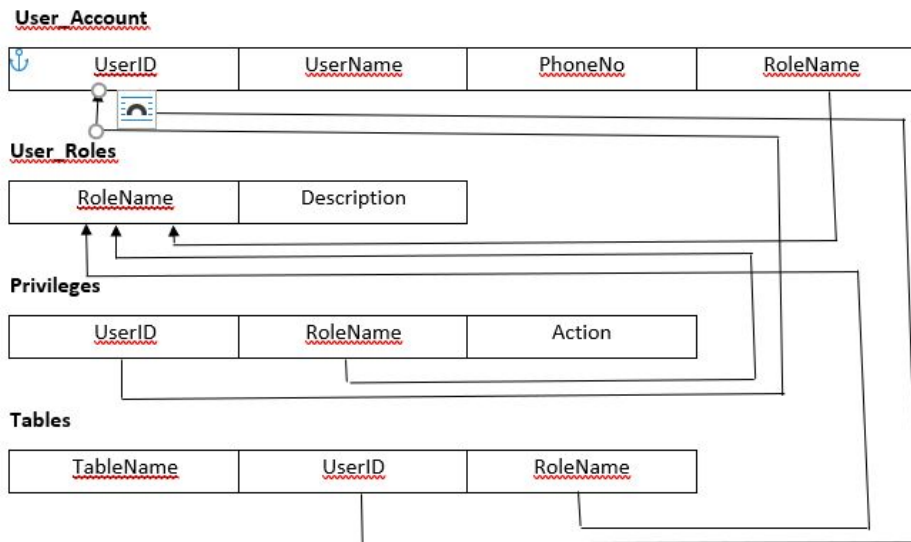
Since account_privileges and relation_privileges are sub entities of privileges and as mentioned in the assumption points- each privilege belongs to only one of the two types – we draw double lines for total participation and 'd' to represent disjoint considering all the members in privileges participate in any one of the sub entities(only one).

We have also shown binary and ternary relationships mentioned in the assumptions.

Multiplicity is also drawn in the above diagram, below is the explanation of each:

- **1:M** between User_Account entity and Privileges entity
- **M:1** between User_Account entity and User_Roles entity.
- **1:M** between User_Account entity and Tables entity
- **M:1** between Account_Privileges entity and User_Roles entity.
- **1:M** between User_Roles entity, Tables entity and Relation_Privileges entity

Part 2: Relational Schema

User_Account

UserID	UserName	PhoneNo	RoleName

User_Roles

RoleName	Description

Privileges

UserID	RoleName	Action

Tables

TableName	UserID	RoleName

We have added an Action attribute to Privileges, which will include SelectPrivileges , UpdatePrivileges ,deletePrivileges ,CreatePrivileges, etc.

CREATE statements:

CREATE TABLE USER_ACCOUNTS (

UserID int NOT NULL UNIQUE,

UserName varchar(255) NOT NULL,

PhoneNo int NOT NULL UNIQUE,

RoleName varchar(255) NOT NULL UNIQUE,

PRIMARY KEY(User_ID)

FOREIGN KEY (RoleName) REFERENCES USER_ROLES(RoleName));

CREATE TABLE USER_ROLES (

RoleName varchar(255) NOT NULL UNIQUE,

Description varchar(255) NOT NULL,

PRIMARY KEY(Role_Name));

CREATE TABLE PRIVILIGES(

UserID int NOT NULL UNIQUE,

Select_priviliges varchar(10),

update_previliges varchar(10),

delete_previliges varchar(10),

create_previliges varchar(10),

RoleName varchar(255) NOT NULL UNIQUE,

FOREIGN KEY (UserID) REFERENCES USER_ACCOUNTS(UserID),

FOREIGN KEY (RoleName) REFERENCES USER_ROLES(RoleName));

```sql
CREATE TABLE Tables (

    TableName varchar(255)NOT NULL UNIQUE,

    RoleName varchar(255) NOT NULL UNIQUE,

    UserID int NOT NULL UNIQUE,

    FOREIGN KEY (UserID) REFERENCES USER_ACCOUNTS(UserID),

    FOREIGN KEY (RoleName) REFERENCES USER_ROLES(RoleName));
```