

Name: Tyrone Matthew Phanghegar

NIM: 2440037430

Course: Database Systems

1. Entity Relationship Diagram [50%]

1. From the above diagram, list all the objects including its attributes!

Users

- UserID
- FirstName
- LastName
- School
- UserAddress
- Email
- PhoneNumber
- UserLocation
- DateOfBirth
- Gender

Friend

- FriendID
- UserID

Posts

- PostsID
- UserID
- PostContent
- PostDate

PostLikes

- PostLikeID
- PostID
- UserID

Photos

- PhotoID
- PostID
- ImageContent

Shares

- ShareID
- PostID
- UserID

Pages

- PageID
- PageName
- PageContent

PageLikes

- PageLikesID
- PageID
- UserID

Comments

- CommentID
- PostID
- UserID
- CommentContent
- CommentDate

CommentLike

- CommentLikeID
- CommentID
- UserID

Alternatively, the answer can be viewed on the ERD contained within the repository.

2. Determine the relation between every object, specify the master and child table!
All the Object's Relation are One-to-Many, with the One usually coming from the Master Table, and the Many on the Child Table.
All the Relations between Master and Child Table will be listed below in a form of

Master Table → Child Table

- Users → Friend
- Users → PostLikes
- Users → Posts
- Users → Shares
- Users → Comments
- Users → CommentLike
- Users → PageLikes
- Posts → Photos
- Posts → PostLike
- Posts → Shares
- Posts → Comments
- Comments → CommentLike
- Pages → PageLikes

3. For each object, decide it is constraint and specify the reason in detail!

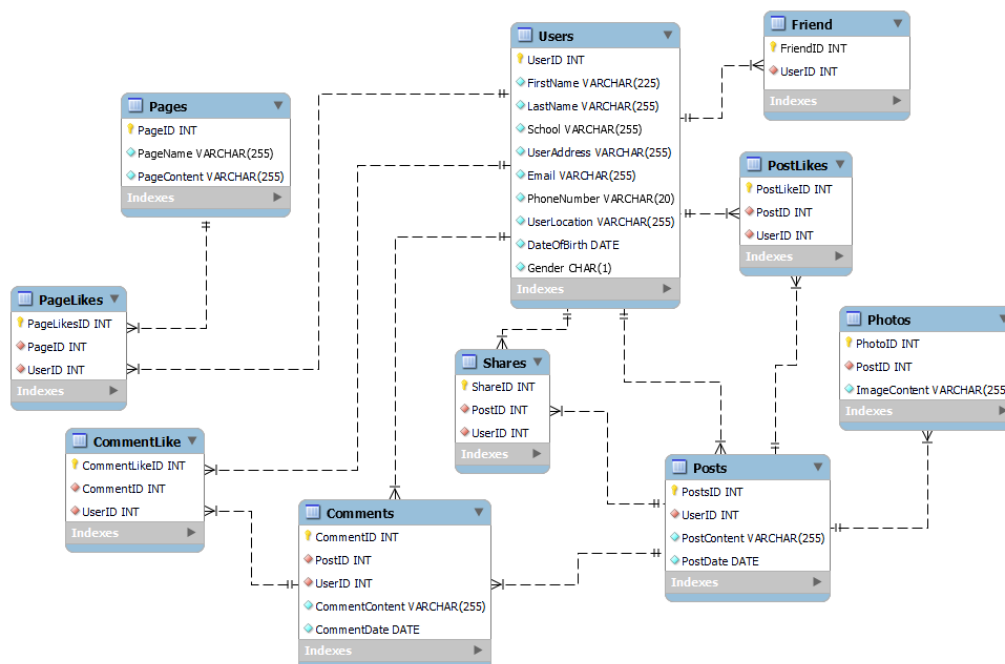
Each Object has it's own Table, which in turns mean that each object have a Primary Key, while the original ERD Design from the Problem Statement does not picture each Object to have a Primary Key, I believe that by having a unique identifier in everything, it will improve maintainability and avoid problems.

Constraints are put to correctly set up all the Foreign Keys and it's References.

Additional constraint are put on "Email" and "Gender" in the Users Table, the Email's type is VARCHAR, with a constraint that the email must have '@' in it, to signify that it's an email. The constraint is imposed in a form of checking whether '@' exist in the string with '%@%'. The Gender is limited to two options, 'M' for Male and 'F' for Female. The constraint is imposed by checking whether the value is 'M' or 'L'.

The last constraint is put on the 'ImageContent' Value from the Photos Object, the value is limited to ones starting with 'http://' or 'https://' and ends with either '.jpg', '.png', or '.jpeg'.

4. Draw the above diagram in "ERD Format" which includes the data types, primary and foreign key, and relation between objects.



The same Picture is available in the Repository.

2. Data Definition Language [50%]

1. Explain what data integrity is and how do we maintain it in SQL Server!

Data Integrity is the Accuracy, Consistency, and Reliability of Data contained within the Table. A Database with a Good Data Integrity is a Good Database, therefore, it's in everyone's best interest to maintain and keep the Data Integrity within a Database, which can be done by imposing strict constraint within the Database, to ensure that the data saved within is accurate and reliable. Ensuring that each object and entity within the Database have a good and well defined relationship within each other will also improve the Data Integrity of a Database.

2. Explain the difference and give example for: primary key, foreign key, and composite key!
Primary Key is a key or an attribute, which defines what an object is, it works as an identifier that is unique with one another. It's used to identify different objects who may or may not have the same exact data stored within them. A good example of a Primary Key is the Student Number from Schools or University, an IMEI or International Mobile Equipment Identity, which identifies mobile phones and electronics.

Foreign Key is a key or attribute that is referenced from another Object. This key or attribute match and syncs with the Key or Attribute it's Referencing to. One example of Foreign Key is a Forum Software or Internet Forum, where you have an ID that identifies your account, in this case, the ID is a Primary Key on your Account, but it also identifies the post or content you uploaded or posted under the said account, in that case, it acts as a Foreign Key.

A Composite Key is a Key or Attribute that consists of one or more "Primary Key", in essence, the Object have more than one factor or attribute that differentiates it with any other object.

3. Explain the following terms and give example: BEGIN TRAN, COMMIT, and ROLLBACK!
BEGIN TRAN Indicates the beginning of a Transaction, which acts as a temporary layer or some sort of save-point before making changes to the table or the data contained within.

COMMIT saves the changes you have done within the transaction layer/period and end the Transaction afterwards. COMMIT cannot be invoked before starting a Transaction using BEGIN TRAN, doing so will raise an error and interrupt the program.

ROLLBACK will revert all the changes done during the current transaction, effectively resetting the data or database into just before you started a transaction with BEGIN TRAN. ROLLBACK also cannot be invoked before starting a Transaction using BEGIN TRAN, doing so will also raise an error and interrupt the program.

4. Create all the tables above according to your answer in the previous section!
SQL File is in the GitHub Repository.