Consider the following relations of a database for a Social Network:

User (UserId, Name, LastName, Gender, BirthDate)

Friendship (Follower, Followee, StartDate, EndDate)

ObjectType (ObjectTypeID, ObjectDescription, Type)

Object (ObjectID, ObjectType, UploadDate, ObjOwner)

GroupInfo (GroupID, Owner, Description)

GroupMembership (GroupId, UserId, StartDate, EndDate)

ActivityType (ActId, ActDescription)

Activity (ActType, UserId, ObjectId, Date)

Where:

- primary keys are underlined,
- Friendship.Follower is a foreign key to User.UserId,
- Friendship.Followee is a foreign key to User.UserId,
- Object.ObjectType is a foreign key to ObjectType.ObjectTypeID,
- Object.ObjOwner is a foreign key to User.UserId,
- Group.Owner is a foreign key to User.UserId,
- GroupMembership.GroupId is a foreign key to GroupInfo.GroupId,
- GroupMembership.UserId is a foreign key to User.UserId,
- Activity.ActType is a foreign key to ActivityType.ActId,
- Activity.UserId is a foreign key to User.UserId,
- Activity.ObjectId is a foreign key to Object.ObjectID.

Part I Schema Understanding

Answer the following questions:

1. Is friendship between two users (stored in "Friendship Table") directed (Yes/No)? Why? (6 pts)

2. Does a group owner have to be a member of his/her group?(Yes/No)? Why? (6 pts)

3. Can we have two different users with the same last name?(Yes/No) Why? (6 pts)

4. If we need to add a new type of object to the database which table we should use? (6 pts)

Part II SQL Queries

For each part of this question (considered independently of the other parts), write an SQL statement that accomplishes the given requirements.

1. Find the distribution of users by Gender in the social network. (8 pts)
2. Find the first name and last name of users and the names of the groups they are members of, who are following user with id 2. (12 pts)
3. Find the list of users (UserId, Name, LastName) and also their group descriptions if they own any. Note that each user may own more than one group. (8 pts)
4. Find the list of all users (UserId) which are influential. Influential users are those who have more than two followers. Note: Do not exclude the ended friendships from the results. (10 pts)
5. Find the last names of all users who have posted both images and videos. (15 pts)
6. Find the last names of all users who have liked more than one object. For each user, besides the last name show his/her number of likes. Order the results by number of likes in decreasing order. (15 pts)
7. Find the number of all the different object types posted by user with id 4. (8 pts)