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PROJECT REPORT

INSY 661 – Group Project

Creating Database for a

Social Media Company

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Content:

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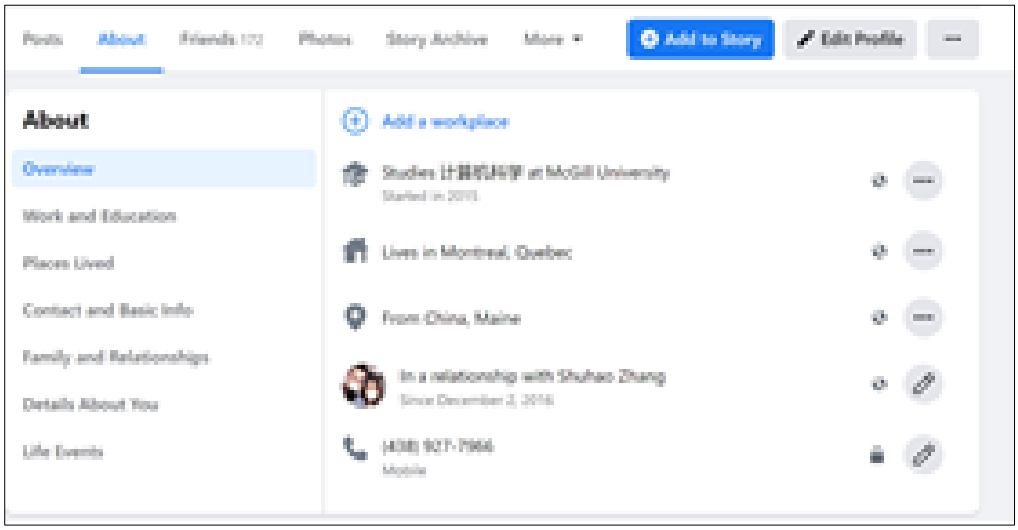
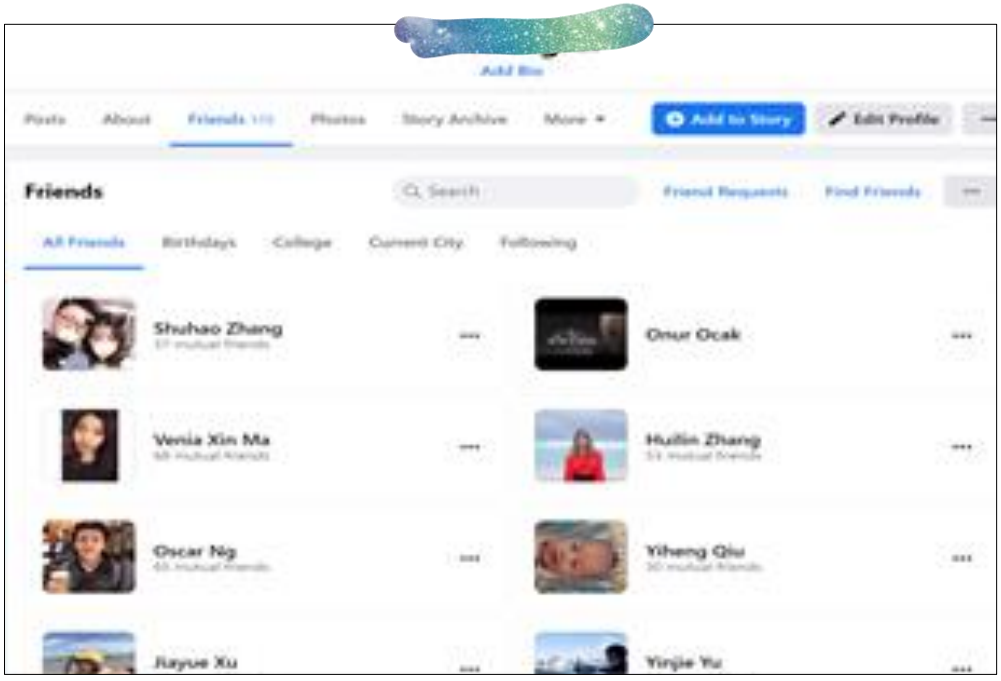
1. **Section 1**
   a. **Overview:**

In the overviews below, we are only tracking the functionalities in the scope of our database, not the whole social media website. But we will show other advanced functionalities of the website in section three such as friend suggestion

USER:
User Information



Users can have friends and our database should be able to store on which date the two users start a friendship



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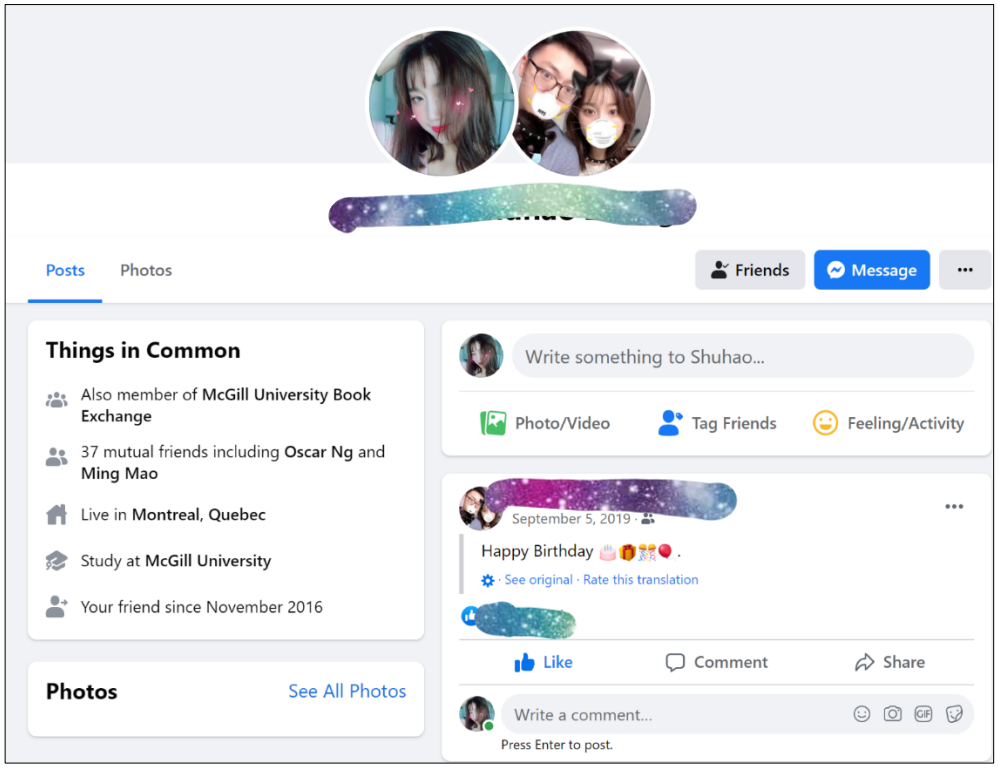
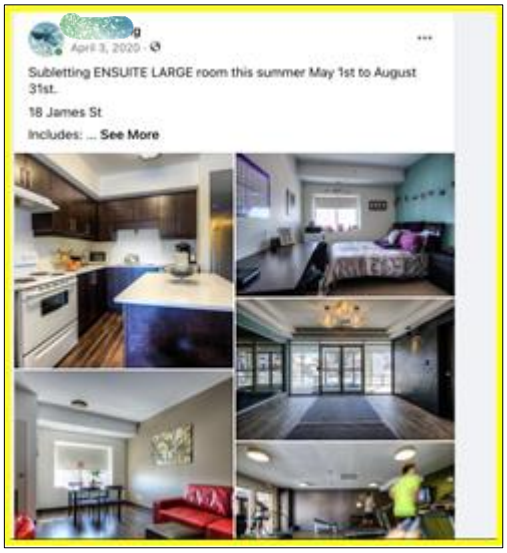
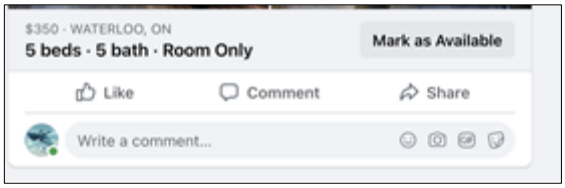


Users can post, can like, comment





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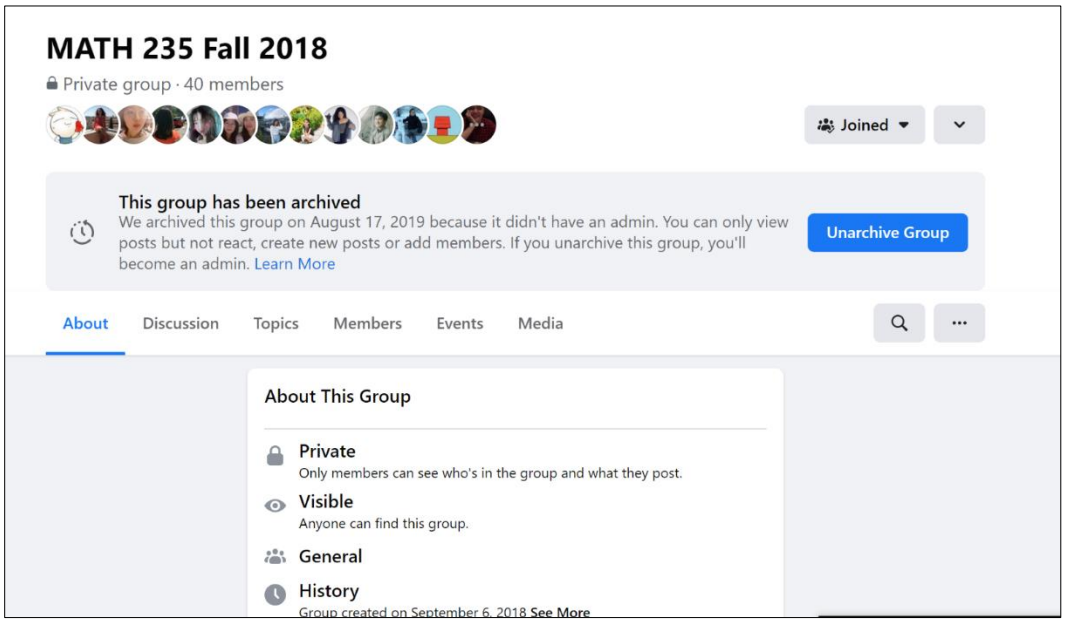
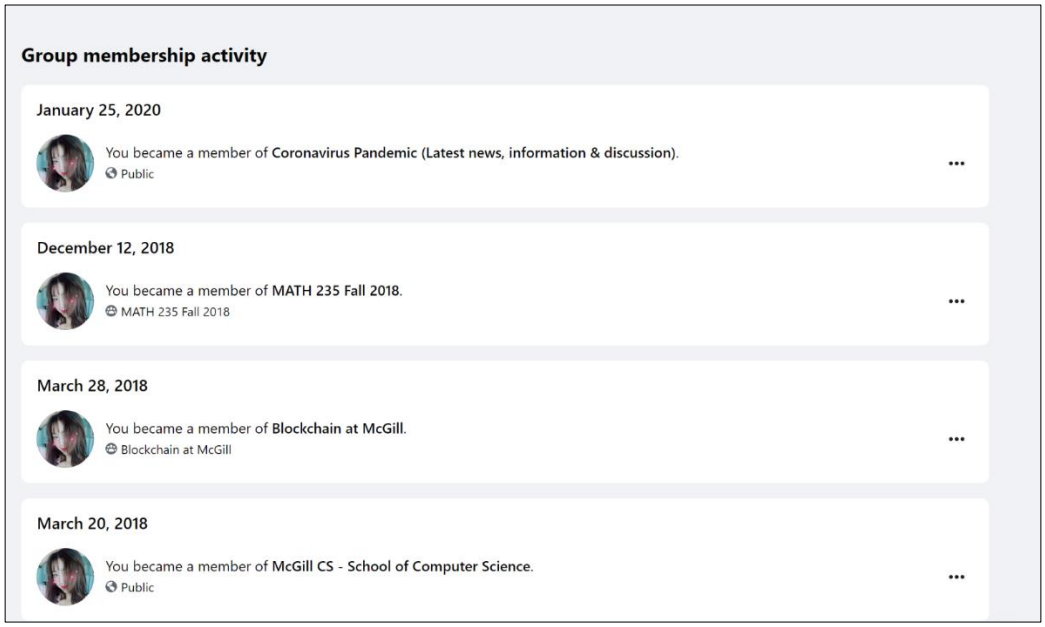
Groups:
Our website should be able to store group information: title, audience, description



A user can join a group, and our database should be able to track on what date one user joined one group



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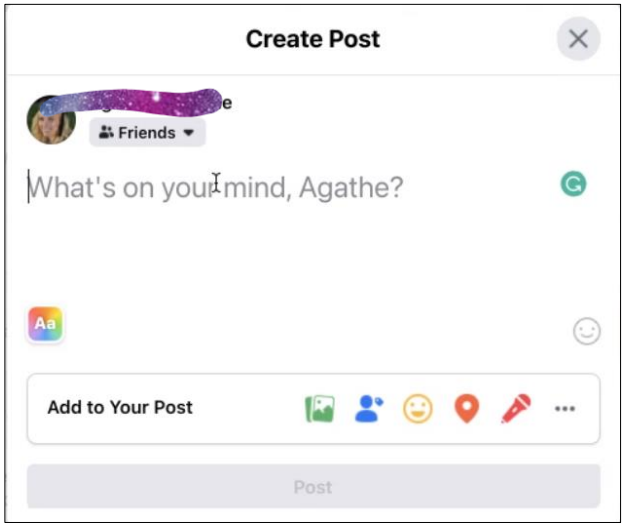
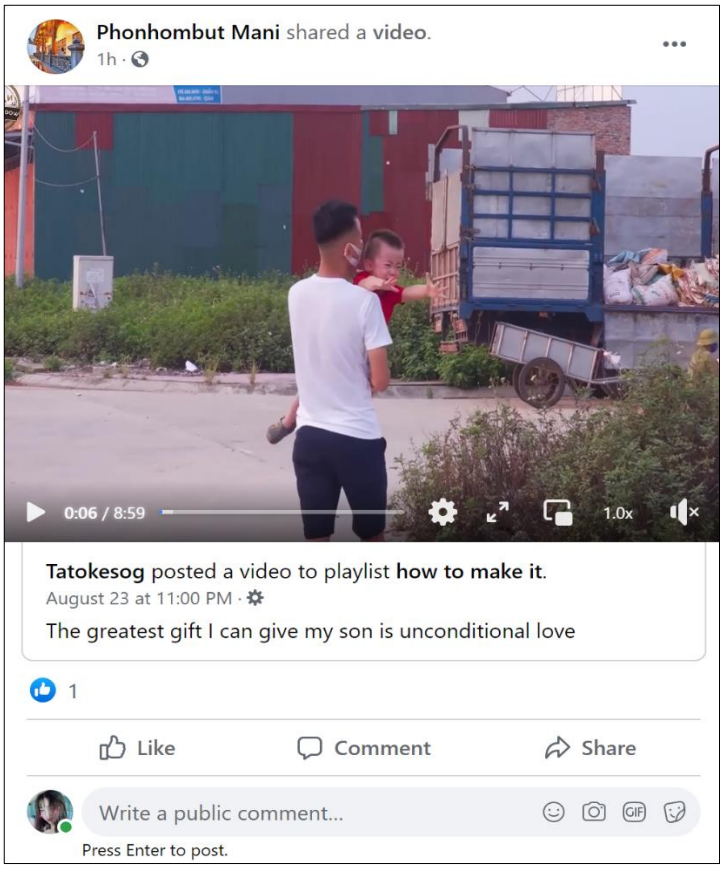
Group members can post inside group discussion



Posts:
A post should contain author (which is a user), date, type, about, audience



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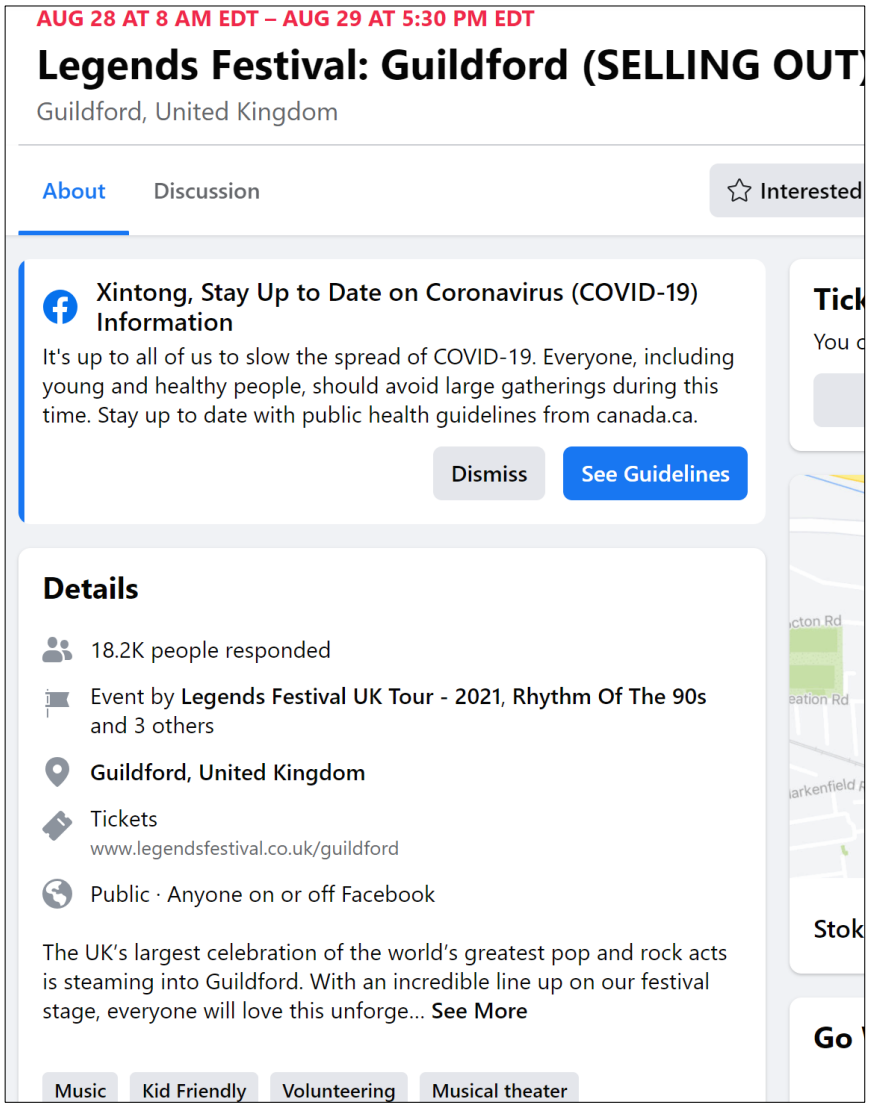
Event:

Events should be able to display their basic information, Such as the title, date, price, audience, description



Users could show their attitudes towards an event:

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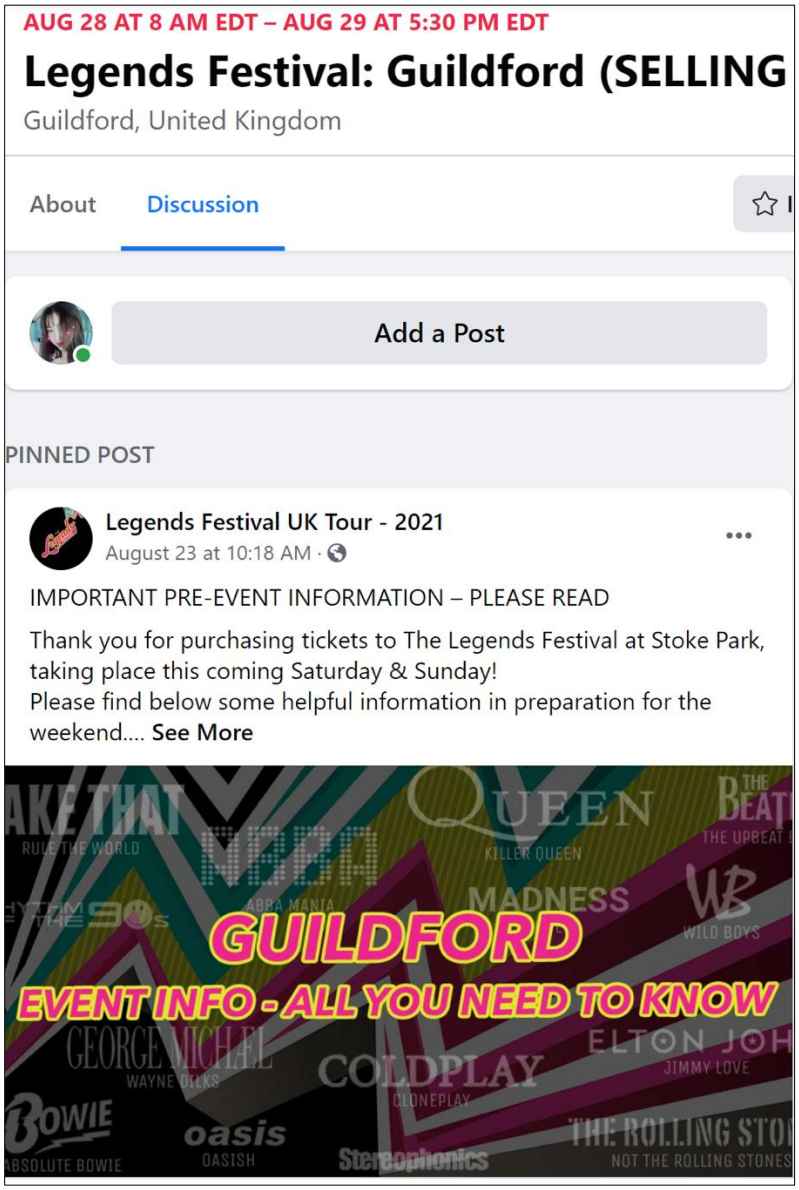
An event can have many posts in its discussion, but one post should be only related to one event



b. Mission

The purpose of our simulated database based on Facebook is to maintain the data that is used to support a platform where people can make friends, participate in events, join groups, and share posts and to attract advertisers to post their ads to their designated users or groups in the database.

Mission Objectives
To perform searches on users
To perform searches on events
To perform searches on groups
To perform searches on posts

To report on users
To report on events
To report on groups
To report on posts

To maintain (enter, update, and delete) data on users
To maintain (enter, update, and delete) data on events
To maintain (enter, update, and delete) data on groups
To maintain (enter, update, and delete) data on posts

To track the status of likes and comments
To track the status of users joining groups
To track the status of users' attitudes towards events (interested & going)
To track the status of users' friendships

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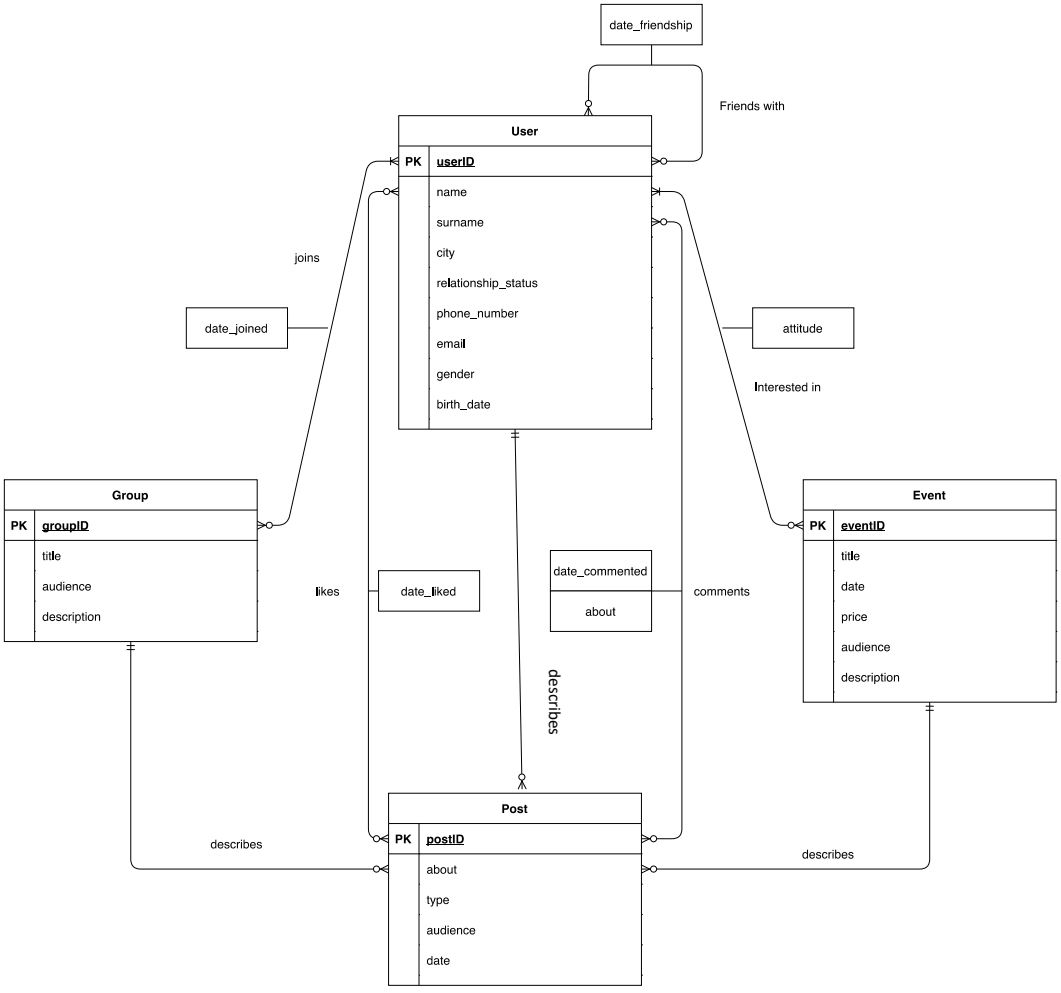
c. Entity Relationship Diagram

Assumptions:

- A user can make friends with one or many users on a certain date.
- Users can post multiple posts, comments, likes, but each post, comment, like should belong to only one user.
- We only store title, audience, description for groups.
- We only store title, date, price, audience, description for events.
- A user can join multiple groups/events, and a group/events can contain more than one user.
- Every user should have an attitude to an event.
- A user can post multiple posts inside a group/event, but each post should belong to only one group/event. A user can also post outside group/event, that is, user can also describe(i.e.post) posts.



d. Data Dictionary

i. Entity information

Entity Name	Description	Aliases	Occurrence
Users	An entity that represents the person who creates a Facebook Account.	N/A	A user can indicate his/her "City", relationship, phone number, email, gender, date of birth, name, password, etc.
Posts	An entity that links to a user. This entity usually consists of text and multimedia (not required).	N/A	A user can indicate his/her content/ type of posts, the audience who can look at the posts, the date on which it was posted, etc.
Events	An entity that lists down events that can be held by an organization or user.	N/A	A user can indicate his/her title of events, the date on which it will be, price, type of audience, and events details/description
Groups	An entity that users can join. This entity can host the event and post information.	N/A	A user can indicate his/her group details, its audience, group information, etc.
Friend	An entity that users connect with.	N/A	A user can indicate his/her list of friends and the date on which they connected
Comment	An entity that contains comments of users.	N/A	A user can indicate his/her comments and their date.
Like	An entity that contains likes done by the users.	N/A	A user can indicate his/her date of liking a post
User_Event	An entity that contains events associated with users.	N/A	A user can indicate his/her status of joining the event
User_Group	An entity that users can be part of.	N/A	A user can indicate his/her date of joining the group

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ii. Attribute information

Entity Name	Attributes	Description	Data Type	Nulls	Multi-valued	Derived	Default
Users	userID	User's unique identifier	INT(10)	No	Yes	No	None
	name	User first name	VARCHAR(255)	No		No	None
	surname	User last name	VARCHAR(255)	No		No	None
	city	User's city	VARCHAR(255)	Yes		No	None
	relationship_status	User's relationship status	VARCHAR(255)	Yes		No	Single', 'In a relationship', 'Engaged', 'Married', 'In an open relationship', 'It's complicated', 'Divorced', 'Widowed'
	phone_number	User's phone number	INT(10)	Yes		No	None
	email	User's email id	VARCHAR(255)	No		No	None
	gender	User's gender	VARCHAR(255)	Yes		No	None
	birth_date	User's Birth date	DATE	No		No	None
Posts	postID	Post unique identifier	INT(10)	No	Yes	No	Not Null
	about	Introduction of post	VARCHAR(255)	Yes		No	None
	type	Type of post	VARCHAR(255)	No		No	None
	audience	Audience having access to post	VARCHAR(255)	No		No	'Public', 'Friends', 'Specific

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							Friends', 'Only me'
	date	Creation date of post	DATE	No		No	None
Events	eventID	Unique event identifier	INT(10)	No	Yes	No	Not Null
	title	Events title	VARCHAR(255)	No		No	None
	date	Events date	DATE	No		No	None
	price	Events ticket/entry price	DECIMAL(10, 2)	Yes		No	None
	audience	Type of audience	VARCHAR(255)	No		No	'Private', 'Public', 'Friends'
	description	Events summary	VARCHAR(255)	Yes		No	None
Groups	groupID	Unique group identifier	INT(10)	No	Yes	No	Not Null
	title	Group's name/title	VARCHAR(255)	No		No	None
	audience	Group members/ audience	VARCHAR(255)	No		No	'Public', 'Private
	description	About group	VARCHAR(255)	Yes		No	None
Friend	date_friendship	Date of friendship	DATE	No	No	No	None
Comment	about	Content of comment	VARCHAR(255)	Yes	Yes	No	None
	date_commented	Date of commenting	DATE	No		No	None
Like	date_liked	Date of liking	DATE	No	No	No	None
User_Event	attitude	going or not or maybe	VARCHAR(255)	No	No	No	‘Going’, ‘Maybe’, ‘Can’t go’
User_Group	date_joined	Date user joined the group	DATE	No	No	No	None

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e. Relational Schema

EVENT (**EVENTID**, TITLE, DATE, PRICE, AUDIENCE, DESCRIPTION)

GROUP (**GROUPID**, TITLE, AUDIENCE, DESCRIPTION)

USER (**USERID,** NAME, SURNAME, CITY, RELATIONSHIP_STATUS,
PHONE_NUMBER, EMAIL, GENDER, BIRTH_DATE)

POST (**POSTID**, USERID, GROUPID, EVENTID, ABOUT, TYPE, AUDIENCE, DATE)

COMMENT (**POSTID**, **USERID**, ABOUT, DATE_COMMENTED)

LIKE (**USERID**, **POSTID**, DATE_LIKED)

FRIEND (**USERID**, **FRIENDID**, DATE_FRIENDSHIP)

USER_GROUP (**GROUPID**, **USERID**, DATE_JOINED)

USER_EVENT (**EVENTID**, **USERID**, ATTITUDE)

2. Section 2

a. DDL and DML

Please refer to the SQL script submitted along with this report.

b. Queries (objectives, assumption, query, and solution)

Query: 1
Objective: Figure out if relationship (marital status) affects the number of posts posted by people.

Code:

```
SELECT
  relationship_status AS Status,
  COUNT(postID) / COUNT(DISTINCT (relationship_status)) AS 'post per user'
FROM
  (SELECT
    userID, name, relationship_status
  FROM
    User
  WHERE
    relationship_status IS NOT NULL) u
    JOIN
```

```
   Post ON post.userID = u.userID
GROUP BY relationship_status
ORDER BY 'post per user' DESC;
```

Output Screenshot:

Status	Post per User
Engaged	1.0000
Married	6.0000
Single	2.0000
Widowed	1.0000

Query: 2
Objective: Figure out if government employees are less likely to comment and like posts due to their job rigidity.

Assumptions: Government people are those whose email ends with .gov

Code:

```
SELECT
   'Government Official',
   COUNT(postID) / COUNT(DISTINCT (userID)) AS 'Avg num of likes&comments'
FROM
   (SELECT
      reaction.userID, reaction.postID
   FROM
      User
   JOIN (SELECT
      userID, postID, date_liked AS date_reaction
   FROM
      `Like` UNION SELECT
      userID, postID, date_commented
   FROM
      `Comment`) reaction ON User.userID = reaction.userID
   WHERE
      email LIKE '%gov') temp
UNION SELECT
   'Non Government Official',
   COUNT(postID) / COUNT(DISTINCT (userID)) AS 'Avg num of likes&comments'
FROM
   (SELECT
      reaction.userID, reaction.postID
   FROM
      User
   JOIN (SELECT
      userID, postID, date_liked AS date_reaction
```

```
FROM
   `Like` UNION SELECT
   userID, postID, date_commented
FROM
   `Comment`) reaction ON User.userID = reaction.userID
WHERE
   email NOT LIKE '%gov') temp;
```

Output Screenshot:

Government Official	Avg num of likes&comments
Government Official	3.0000
Non Government Official	2.1176

Query: 3
Objective: Find out if the price of an event affects people's attitude towards it.

Assumptions: Consider 'Going' as a positive attitude. The others are negative.

Code:

```
SELECT
   x.level Level,
   x.total_attitude 'Total Attitudes',
   y.num_Going 'Number of Going',
   CONCAT(FORMAT(y.num_Going / x.total_attitude * 100,
            2),
         '%') AS '% of Going'
FROM
   (SELECT
      level, COUNT(*) AS total_attitude
   FROM
      (SELECT
      `Event`.eventId,
         User_event.userID,
         User_event.attitude,
         CASE
            WHEN price > 100000 THEN 'Extremely High'
            WHEN price > 200 THEN 'High'
            WHEN price > 0 THEN 'Low'
            ELSE 'Free'
         END `level`
   FROM
      `Event`
```

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```
  JOIN User_Event ON `Event`.eventID = User_event.eventID) temp1
  GROUP BY level) x
    JOIN
  (SELECT
    level, COUNT(attitude) AS num_Going
  FROM
    (SELECT
    `Event`.eventId,
      User_event.userID,
      User_event.attitude,
      CASE
        WHEN price > 100000 THEN 'Extremely High'
        WHEN price > 200 THEN 'High'
        WHEN price > 0 THEN 'Low'
        ELSE 'Free'
      END `level`
  FROM
    `Event`
  JOIN User_Event ON `Event`.eventID = User_event.eventID) temp2
  WHERE
    attitude LIKE 'Going'
  GROUP BY level) y ON x.level = y.level
ORDER BY y.num_Going / x.total_attitude DESC;
```

Output Screenshot:

Level	Total Attitudes	Number of Going	% of Going
Free	3	3	100.00%
Extremely High	2	1	50.00%
Low	6	2	33.33%
High	11	3	27.27%

Query: 4
Objective: Find the most active person on the list

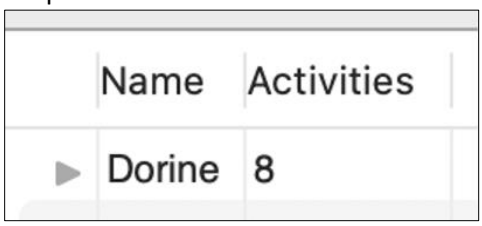
Assumptions: The most active person is the one who has the maximum number of events attended, groups joined, and posts posted. That is, Activities = # of groups+# of events+# of posts.

Code:

```
SELECT
  name Name, Activities
FROM
  (SELECT
    u.userID,
```

```
        u.name,
        a.num_of_group,
        b.num_of_event,
        c.num_of_post,
        a.num_of_group + b.num_of_event + c.num_of_post AS Activities
    FROM
      User u
    LEFT JOIN (SELECT
      userID, COUNT(groupID) num_of_group
    FROM
      User_Group
    GROUP BY userID) a ON u.userID = a.userID
    LEFT JOIN (SELECT
      userID, COUNT(EventID) num_of_event
    FROM
      User_Event
    GROUP BY userID) b ON u.userID = b.userID
    LEFT JOIN (SELECT
      userID, COUNT(postID) num_of_post
    FROM
      Post
    WHERE
      userID IS NOT NULL
    GROUP BY userID) c ON u.userID = c.userID) d
ORDER BY Activities DESC
LIMIT 1;
```

Output Screenshot:



Name	Activities
Dorine	8

Query: 5
Objective: Select people who attend expensive events so that Facebook can target those users and places luxury products' advertisements on their homepages

Assumptions: Assume users with the attitude 'going' are attending these events.

Code:

```
SELECT
User_Event.userID,
price
```

```
from Event
join
User_Event
on Event.eventID = User_Event.eventID
where attitude = 'going'
order by price desc
limit 3;
```

Output Screenshot:

userID	price
5	57179940.62
3	926.68
9	282.00

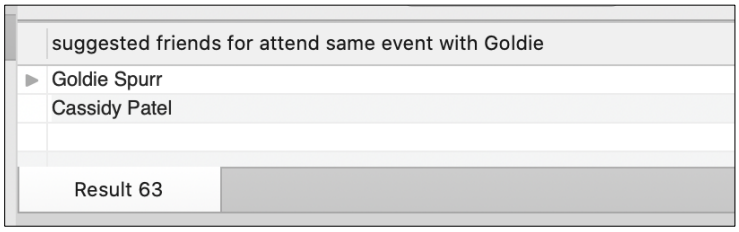
Query: 6
Objective: Suggest friends for the user named Goldie. The suggestion is based on the events Goldie attended. People who attended the same events as Goldie but are not friend with Goldie will be recommended.

Code:

```
select
concat(User. name,' ', User. surname) as 'suggested friends for attending the same event with Goldie'
from
User_Event
join
User
on User_Event.userID = User.userID
where
User_Event.eventID in (select
eventID
from User_Event
where userID in (select userID
from User
where name = 'Goldie'))
and
User_Event.userID not in (select
friendID
from friend
where userID in (select userID
from User
```

where name = 'Goldie'));

Output Screenshot:



Query: 7
Objective:
Suggest friends for the user named Jacquenetta based on her friends. Her friends' friends will be recommended if they are not friends with Jacquenetta.

Code:

```
select
concat(User.name,' ',User.surname) as name,
User.city,
friends.f_name as is_friend_with
from User
join(
select
distinct friendID as ID,
friend.userID as f
From friend
where
friend.userID
in (
select
friendID as userID
from friend
where userID in
(select userID
from User
where name = 'Jacquenetta'))
) as suggest_friends
on User.userID = suggest_friends.ID
join
(select
concat(User.name,' ',User.surname) as f_name,
User.userID as ID
from
user) as friends
on suggest_friends.f = friends.ID
;
```

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Output Screenshot:

name	city	is_friend_with
Everard Morforth	Pilar	Dorine Byrnes
Dido Lorey	Lampa	Dorine Byrnes
Dido Lorey	Lampa	Goldie Spurr
Juliet Roach	Sheikhupura	Goldie Spurr

Query: 8
Objective:
Suggest groups user Jacquenetta might be interested in, based on her friends' interests. Order by the number of Jacquenetta's friends in that group.

Code:

```
select
User_Group.groupID,
`Group`.title,
count(User_Group.userID) as 'number of friends in this group'
from User_Group
join `Group`
on User_Group.groupID = `Group`.groupID
where User_Group.userID in(
select
friendID
From Friend
where Friend.userID in
(select userID
from User
where name = 'Jacquenetta'))
AND
User_Group.groupID not in(
select
User_Group.groupID
From User_Group
where User_Group.userID in
(select userID
from User
where name = 'Jacquenetta'))
group by groupID
order by count(User_Group.userID) desc;
```

Output Screenshot:

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groupID	title	number of friends in this group
3	Politics Department	2
6	ORGB660	1
8	INSY661	1

Result 68

Query 9

Objective: Select the event and show its participants, if anyone is going to it. By doing so, we can analyze those events that tend to attract customers

Code:

```
select event.eventID, event.title, user.name, user.surname

from user_event

inner join event on user_event.eventID = event.eventID

inner join user on user_event.userID = user_event.userID

where user_event.attitude = 'Going';
```

Output Screenshot:

eventID	title	name	surname
1	Ski Trip	Jacquenetta	Servis
11	Museum	Jacquenetta	Servis
3	Celine Dion Concert	Jacquenetta	Servis
11	Museum	Jacquenetta	Servis
11	Museum	Jacquenetta	Servis
4	Daytrip to the mall	Jacquenetta	Servis
7	Cooking Class	Jacquenetta	Servis
2	Graduation 2022	Jacquenetta	Servis
5	Party at my house	Jacquenetta	Servis
1	Ski Trip	Dorine	Byrnes
11	Museum	Dorine	Byrnes
3	Celine Dion Concert	Dorine	Byrnes

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Query: 10
Objective: Suggest groups Dido might be interested in, we knew that Dido has joined the group “McGill”, we could suggest all the other groups contain the keyword “McGill” based on this.

Code:

```
select * from `group`
where title like (
concat("%", (select title from (
select Dido.name, `group`.title from user_group
inner join(
select * from user
where name = 'Dido'
)as Dido
on user_group.userID = Dido.userID
inner join `group` on `group`.groupID = user_group.groupID
)as a), "%")
) AND TITLE <> (
select title from (
select Dido.name, `group`.title from user_group
inner join(
select * from user
where name = 'Dido'
)as Dido
on user_group.userID = Dido.userID
inner join `group` on `group`.groupID = user_group.groupID
)as a
);
```

Output Screenshot:

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groupID	title	audience	description
1	MMA McGill	Private	2021 cohort
12	McGill Math	Private	All burnsiders!
13	McGill Book Excahnge	public	a place to buy/sell cheap textbooks!

Query: 11
Objective: Find the author of the post which is commented by most users, display the post_ID and the number of comments it received as well.

Code:

```
select post.postID as mostPopularPost, user.userID as mostPopularAuthor,
c.NumberOfComments from post
inner join (
select * from (
select count(distinct(userID)) as NumberOfComments, postID
from `Comment`
group by postID
)as a
where a.NumberOfComments = (
select max(NumberOfComments) from (
select count(userID) as NumberOfComments, postID
from `Comment`
group by postID
)as b
)
)as c
on post.postID = c.postID
inner join user on post.userID = user.userID
```

Output Screenshot:

mostPopularPost	mostPopularAuthor	NumberOfComments
1	1	5

Query: 12
Objective: count the number of potential attendees to an upcoming event

Assumption: Potential attendees include “maybe” and “not going”

Code:

```
Select Event.eventID, Event.title, A.NumberOfAttendees
```

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```
From Event
Join (Select count(User_Event.userID) NumberOfAttendees, User_Event.eventID
From User_Event
Where User_Event.attitude != "Can't go"
Group by eventID) as A on Event.eventID=A.eventID
```

Output:

eventID	title	NumberOfAttendees
1	Ski Trip	2
2	Graduation 2022	2
3	Celine Dion Concert	3
4	Daytrip to the mall	1
5	Party at my house	3
7	Cooking Class	3
9	MMA Graduation	1
10	Animal Shelters Volunteer	2
11	Museum	3

Query: 13
Objective: Determine the average age of a Facebook user

Code:

```
Select Avg(B.Age) as AverageAge
From (Select ("2021"- A.BirthYear) as Age
From (Select extract(Year from birth_date) as BirthYear
From `User`) as A) as B
```

Output:

AverageAge
37.45

Query: 14
Objective: Find the users who have more male friends than females.

Code:

```
SELECT
  user.name, b.userID, b.Male_friend, c.Female_friend
FROM
  (SELECT
    userID, COUNT(gender) Male_friend
  FROM
    (SELECT
    friend.userID, friend.friendID, user.gender
```

```
  FROM
    Friend
  JOIN user ON user.userID = Friend.friendID) a
  WHERE
    gender = 'Male'
  GROUP BY userID) b
    LEFT JOIN
  (SELECT
    userID, COUNT(gender) Female_friend
  FROM
    (SELECT
    friend.userID, friend.friendID, user.gender
  FROM
    Friend
  JOIN user ON user.userID = Friend.friendID) a
  WHERE
    gender = 'Female'
  GROUP BY userID) c ON b.userID = c.userID
    JOIN
  user ON b.userID = user.userID
WHERE
  b.Male_friend > c.Female_friend;
```

Output Screenshot:

name	userID	Male_friend	Female_friend
Jacquenetta	1	6	1
Everard	3	2	1

Query 15

Objective: Suggest a friend for the user named Jacquenetta, based on strangers who commented on Jacquenetta's post.

Assumption: a person who is not friends with Jacquenetta is considered to be a stranger.

Code:

```
select
concat(User.name,' ',User.surname) as 'suggested friend',
Comment.date_commented
from
Comment
join User
on Comment.userID =  User.userID
where
```

```
Comment.postID in
(select
Post.postID
from
Post
where Post.userID in
(select User.userID
from User
where name = 'Jacquenetta'))
AND
Comment.userID NOT IN
(select
Friend.friendID
from
Friend
where Friend.userID in
(select User.userID
from User
where name = 'Jacquenetta'))
AND
Comment.userID NOT IN
(select User.userID
from User
where name = 'Jacquenetta')
```

Output Screenshot:

Result Grid | Filter Rows:

suggested friend	date_commented
Everard Morforth	2016-02-25
Amethyst Kline	2024-02-26
Melanie Clemons	2018-08-29

Query 16

Objective: identifying the upcoming event in the next month

Code:

```
select eventID
from `Event`
where extract(month from `date`) = (select (extract(month from sysdate())) + 1
as next_month)
and extract(year from `date`) = (select (extract(year from sysdate())))
```

Output:

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eventID
6

Query 17

Objective: identifying users who are engaging the most with posts by evaluating their number of likes attributed to different posts.
Code:

```
select userID, count(distinct postID) as nb_likes
from `Like`
group by userID
order by userID
```

Output:

userID ▲ 1	nb_likes
1	2
3	1
4	1
5	1

Query 18

Objective: determining the number of friends per user.
Code:

```
select userID, count(distinct friendID) as nb_friends
from Friend
group by userID
order by userID
```

Output:

userID ▲ 1	nb_friends
1	2
2	2
5	1

Query 19

Objective: determining the proportion of posts that contain a photo attachment.
Code:

```
select t.nb_photos/s.nb_posts as proportion_posts_photos
from(
```

```
select count(distinct postID) as nb_posts
from Post) as s,
(
 select count(distinct postID) as nb_photos
from Post
where type like 'Photo') as t
```

Output:

proportion_posts_photos
0.6000

Query 20

Analyze the influence of marital status on people's consumption perceptions through our social media platform

Code:

```
select Count(Marital_Status)/(
select count(*) as total_people_going from (
select Marital_status, userID, eventID,
CASE

        WHEN price > 900 THEN 'High'
        ELSE 'Low'

    END `Price_level`,

CASE
     when attitude = "Can't go" then "not interested"
     else "interested"
end "attitude_level"

from (
select  user_event.userID,  user_event.eventID,  u.Marital_Status,  user_event.attitude,
event.price
from user_event
inner join
(
SELECT
    userID,
    gender,

      CASE

        WHEN relationship_status = 'Married' THEN 'Married'
```

```
            ELSE 'Unmarried'

        END `Marital_Status`

    FROM user
)as u
on u.userID = user_event.userID
inner join event on user_event.eventID = event.eventID

)as a
)as b
where attitude_level <> 'not interested'

) as percent_married_people_going_to_expensive_event
from (
select * from (
select Marital_status, userID, eventID,
CASE

            WHEN price > 900 THEN 'High'
            ELSE 'Low'

        END `Price_level` ,

CASE
         when attitude = "Can't go" then "not interested"
         else "interested"
end "attitude_level"

from (
select  user_event.userID,  user_event.eventID,  u.Marital_Status,  user_event.attitude,
event.price
from user_event
inner join
(
SELECT
      userID,
      gender,

        CASE

            WHEN relationship_status = 'Married' THEN 'Married'

            ELSE 'Unmarried'
```

```
        END `Marital_Status`

    FROM user
)as u
on u.userID = user_event.userID
inner join event on user_event.eventID = event.eventID

)as a
)as b
where attitude_level <> 'not interested'
)as c
where Marital_Status = 'Married'
and price_level = 'High';
```

Output:

	percent_married_people_going_to_expensive_event
▶	0.0476

3. Section 3

Complex / Interesting Query Identification

Two interesting queries: Query 3 and Query 10

Query 3

i. Idea: When analyzing users' behaviors towards events, we think the price of an event is one of the factors that affect people's attitude (i.e., one of the options among "Going", "Maybe", "Can't go"). Therefore, it would be useful to query the relationship between price levels and percentage of Going, where %Going =#_of_Going /(#_of_Going+#_of_Maybe+#_of_Can'tGo)

ii. Logic: Since it is harder for SQL language to analyze continuous price data than using other programming languages where we can run linear regressions at ease such as Python and R, we divide the continuous price data into four levels using Case functions, which are "Extremely High", "High", "Low", and "Free". We first query and count the total number of attitudes towards each event, then count the number of going towards each event, finally we inner join these two tables based on the 4 price levels and derive the percentage of going in descending order.

iii. Challenges faced

1. People who do not go may fully ignore the event posts and do not express their attitudes on the platform. This may decrease the number of “Can’t go” and thus the % of going may falsely seem higher
2. As mentioned in logic, linear regression might be more useful for the continuous data unless there are strong patterns for clusters
3. Data is not enough, especially for 'extremely high'. This may cause the % of Going to seem high in the result
4. The two counts cannot be done using a single table because the latter needs additional conditions.

iv. Overall learning:

1. The MySQL built-in function Case function can be helpful for grouping continuous data into clusters when the cutoff values are determined
2. MySQL is a DBMS and SQL language is a query language. People should not be constrained to SQL when they work in data analysis. Data can always be loaded to other platforms for further exploration

Query 10

i. Idea: When browsing the Facebook site, we found that Facebook uses text-matching to suggest groups that users might like, so we wanted to implement this feature on our social platform as well.

ii. Logic: We first find the groups that the target user has joined, then use MYSQL's LIKE statement and regular expression to find other groups with similar names, and don't forget to exclude the groups that the target user has joined in the final recommendation.

iii. Challenges: While splitting a string in python is easy, it's very difficult to do in MySQL, so we can only suggest groups for users that contain the name of their existing group, and it's very difficult to cut out a part of the existing group name for recommendation

iv. Learnings: When using subquery inside the MYSQL like statement, we must remember to add "%" to the concat statement, otherwise the subquery return will not be used properly, and we will not get the desired output. (for example, LIKE (CONCAT(“%”, (….),”%”)))

One complex query: Query 20

Query 20

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i. Idea: People are likely to become frugal when they get married because most of them have to think about raising children, so we wanted to examine this trend through our social platforms.

ii. Logic: we first join user_event with user and event table, from these we only need marital status, userID, eventID, attitude, price. Then we select out those records with high price, and count how many of them are married, finally use the previous number we got to divide by the whole number.

iii. Challenges: When group by, not only marital status needs to be taken into account, but also price, that is, the impact of both on people, which is somewhat tricky here. Because only one column can be grouped by when group by.

v. Learnings: When faced with the tricky problem of having two or even more columns that need to be grouped by, we can instead consider representing the result in probabilistic form, so that we can reduce the number of columns that need to be grouped by. And it does not affect our analysis, because after deriving one probability, we can subtract it from 1 to get another probability, and this comparison also gives us a sense of who has more influence on the result.

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Appendix #1: Draft ERD – first attempt at developing the ERD. We modified this ERD in order to accurately capture the many to many relationships.