



# **ITOM6265 Database Management**

## **Final Project**

### **Group18**

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## **I. Database Application Overview**

Nowadays, people tend to connect with others who are outside of their daily social circles with the same common interest, so our team designed a database application that provides a platform containing information about group events that are classified into a variety of categories for users to explore and join in major US cities, such as cities in CA, IL, NY. We named our app as Like-minded and our slogan is “Life is an event, make it memorable”, because we hope our users can search for groups or events to join based on the topics that they are interested in, find like-minded people and make memories. Users can create new groups if there are no matches with their interests. Through Like-minded, our team can also gather insights on trending topics and event distribution from data collected.

The data was found from Kaggle - Kaggle Data, which was collected using Meetup API.

## **II. Project Scope**

Our database includes several entities, details associated with the event planning includes: Categories

- Groups
- Member groups
- Events
- Members
- Cities
- Venue

Like-minded serves as a search engine for the end-users to access information about categories, groups, and events in the database and it helps users to find and join groups related to their interests and make new friends. Through the user interface, users are able to perform searches on categories and groups based on factors such as location, group rating, personal interests. As a result, users will get a list of events that match their search criteria and location shown on a map.

Our database includes several entities to show the activity information. Some of the important metrics include category, group, member, and city. We will also create an additional analytics dashboard to monitor users' activities and generate insights on member enrollment and interest groups.

## **III. Project Goal**

The intended users for Like-minded include both internal and external users. External users are people who are looking for interest groups and events to join and others to network. Through this search engine, people are given access to information about different categories, groups, and events that arouse their interest, though visualizing the events information on the event dashboard enables users to network more effectively and better explore the opportunities. In addition, Like-minded also provides a platform for users to store member information, manage their interested



groups or create new groups or events if they can find any groups or events of interest after signing up. Besides, Like-minded can be analyzed internally to generate user insights through graphing the relationships among entities in an interactive analytics dashboard. Our team can cooperate with marketing agencies and provide insights that enable them to target customer segments and identify customer interest trends to tailor marketing campaigns, thus optimizing advertisement costs on different marketing channels.

## IV. Entity Relationship Diagram Design

### 1. Conceptual Design

We create seven entities listed below for our database.

- **Categories** – Category information, such as category\_id (primary key) and category\_name
- **Groups** – Group information, such as group\_id (primary key), group\_name, rating and group\_photo\_link
- **Events** – Event information, such as event\_id (primary key), event\_name, and event\_description
- **Venues** – Address information for each event, such as venue\_id (primary key), address and city
- **Members** – Member information, such as member\_id (primary key), city, email, and password
- **Cities** – City information associated with each group, such as city\_id (primary key), city, latitude, and longitude
- **member\_group** – An associate entity between Groups entity and Members entity

### 2. Logical Design

#### 1) Reason

The goal of our shiny app is to bring people together to explore activities that they are interested in. Therefore, Categories Entity is first created to separate interests into multiple categories. Groups Entity and Events Entities are then created so that users/members are able to identify groups and activities that interest them most and join events accordingly. Members Entity is critical because it contains detailed information of users/members, which helps keep track of user behavior and generate user insights for us. Cities Entity and Venues Entity contain location information, which can be used in data visualization analysis, such as creating interactive maps. The last entity is called member\_group, working as an associative entity to better illustrate many-to-many relationships between Members Entity and Groups Entity.

## 2) Transformation

- One-to-many Relationships

One category can have many groups, while one group can only belong to one category. One group can create many events, while an event can only be created by one group. One city can have many groups and members, while one group and one member can only be associated with one city. One venue can host many events, while only one event can be host at one venue.

- Many-to-many Relationships

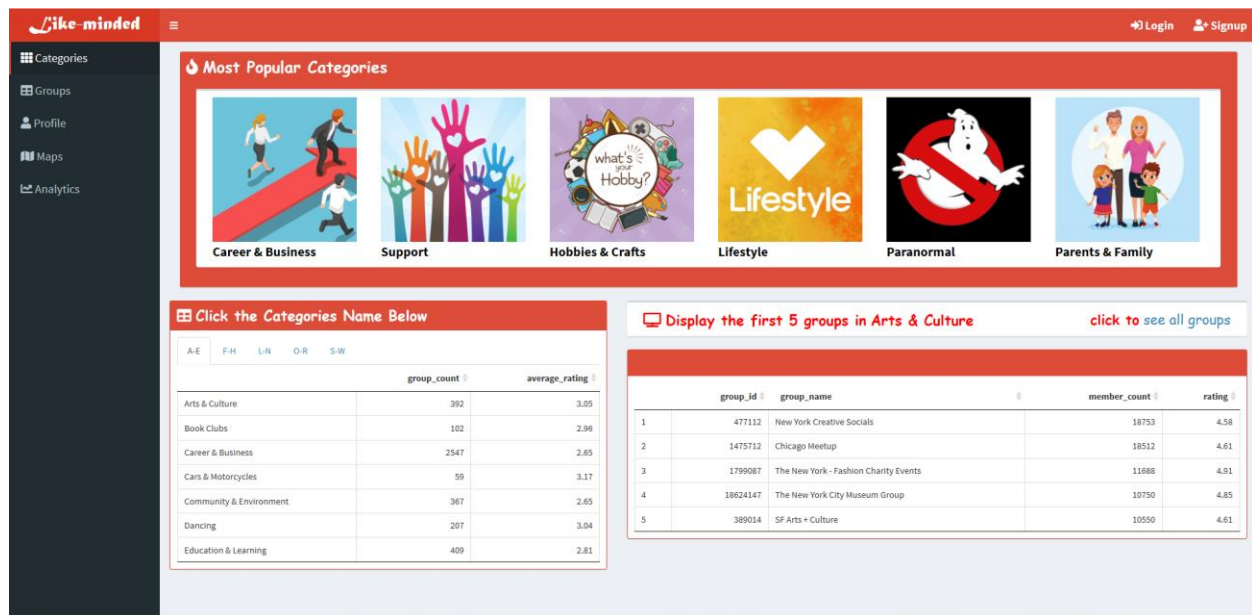
One group can have many members and one member can join multiple groups. However, this many-to-many relationship is implemented by adding an associative entity called member\_group, which includes member\_id and group\_id.

- Normalization

We normalize our database relationship to the 3rd normal form. First, there are no multivalued attributes. For example, group name and group description are separated into two attributes. Second, every non-key attribute is fully functionally dependent on the entire primary key. Each entity has a unique primary key and no composite key exists. Third, there are no transitive dependencies. The primary key in each entity is not a determinant for another attribute.

## V. Shiny User Interface





- Like-minded

Login
Signup

Categories
Groups
Profile
Maps
Analytics

### Search Groups

 Arts & Culture X Search

Show 15 entries

	group_name	category_name	members	city	rating
1	Chicago Theater Goers Meetup Group	Arts & Culture	474	Chicago	4.3
2	Union Square Reading Group	Arts & Culture	1040	New York	4.5
3	The San Francisco Figure Drawing Group	Arts & Culture	4035	San Francisco	4.72
4	The San Francisco Play Reading Meetup Group	Arts & Culture	52	San Francisco	4.67
5	NEW YORK MUSEUM CLUB	Arts & Culture	1592	New York	4.57
6	Chicago The Artist's Way Meetup Group	Arts & Culture	267	Chicago	4.91
7	SF Arts + Culture	Arts & Culture	10550	San Francisco	4.61
8	The Broadway Genius Club	Arts & Culture	8367	New York	4.46
9	Central Park Sketching & Art Meetup Group	Arts & Culture	6192	New York	4.77
10	New York Creative Socials	Arts & Culture	18753	New York	4.58
11	The Mural Project Meetup	Arts & Culture	224	New York	4.75
12	New York Shakespeare Reading Group	Arts & Culture	1928	New York	4.69
13	Asian Artists Meetup	Arts & Culture	101	New York	4.79
14	Chicago Acting Meetup Group	Arts & Culture	809	Chicago	4.48
15	ArtForward	Arts & Culture	8176	New York	4.62

Showing 1 to 15 of 380 entries
Previous
1
2
3
4
5
...
26
Next

#### Group Description

#### Event

Leaflet | Map data © OpenStreetMap contributors

Join the Group

- Users can use the search bar to do the fuzzy search for either categories and groups. The small search box under the main search bar allows the user to do further detailed search within the result table.



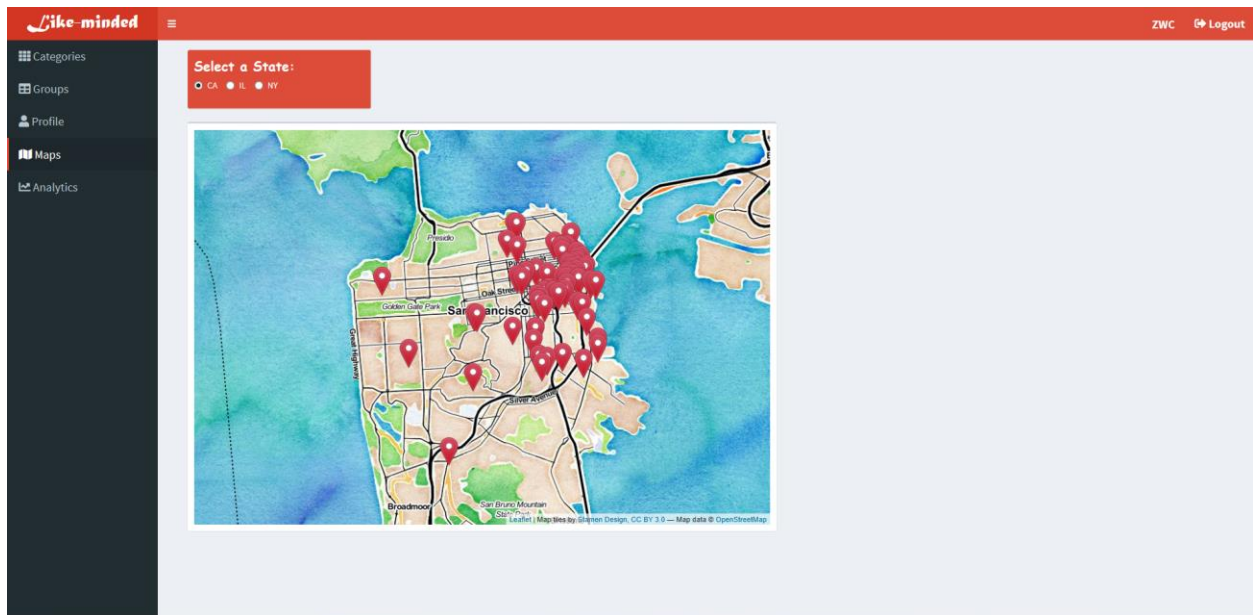
- On clicking on the group name in the left-hand-side table, the right-hand side would display details including the group photo (top box), group description and the events held by the group. The bottom two boxes are collapsible and initially collapsed.
- If a logged user is interested in the selected group, he can click on the "join the group" button. If a non-logged user clicked on the button, a warning message would pop up asking the user to log in before joining the group. If a logged user had already joined the group, a warning message would pop up noticing that the user has already been in the selected group.

The screenshot displays the 'Like-minded' web application interface. The top navigation bar is red with the 'Like-minded' logo on the left and 'ZWC' and 'Logout' on the right. A dark sidebar on the left contains navigation links: 'Categories', 'Groups', 'Profile' (selected), 'Maps', and 'Analytics'. The main content area is divided into three red-bordered panels. The top-left panel, titled 'User Profile', shows the user's details: Username: ZWC, Member ID: 13724812, and City of Residence: Chicago, with an 'Edit Profile' link below. The bottom-left panel, titled 'Groups You've Joined', features a search bar and a table of 7 groups. The table has columns for group\_id, group\_name, and category\_name. The right panel contains two sections: 'Create a New Group' with a category dropdown, group name and description input fields, a 'Join mode: Open' toggle, and a 'Create' button; and 'Select a Group to Leave' with a text input for group ID and a 'Leave' button.

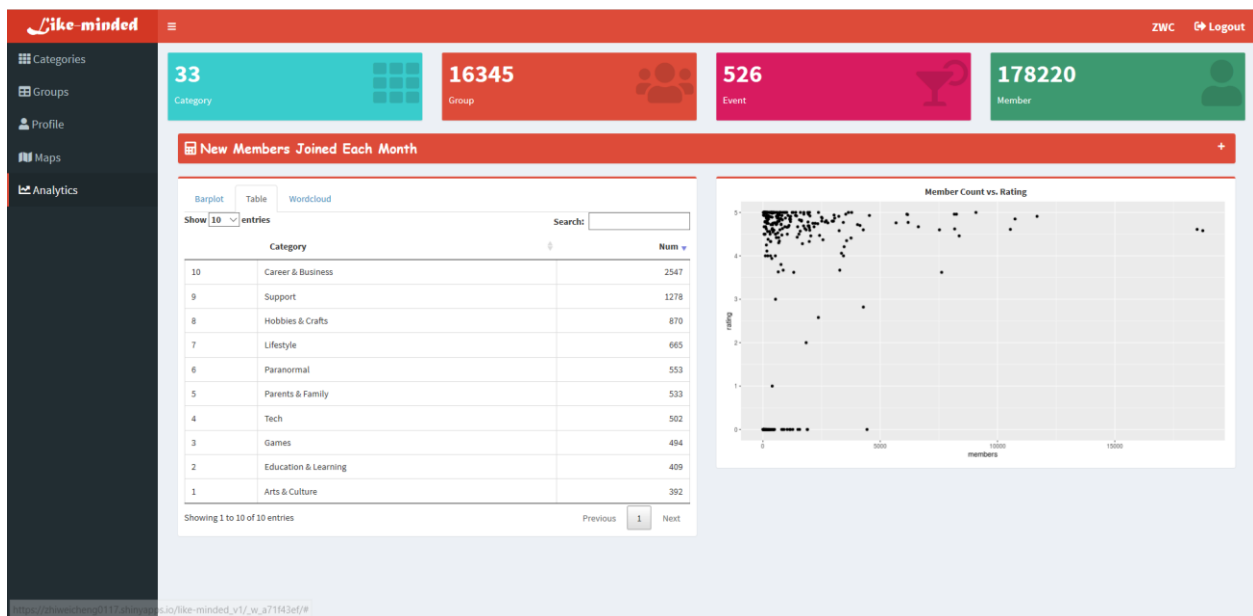
	group_id	group_name	category_name
1	1617532	Really Fun NYC Events	Career & Business
2	8726642	City Lit Books in Logan Square	Movies & Film
3	153288	Chicago Theater Goers Meetup Group	Arts & Culture
4	418253	The Broadway Genius Club	Arts & Culture
5	1062259	Alternative Fun Stuff to do in NYC	Career & Business
6	9201702	Drawing New York	Arts & Culture
7	389014	SF Arts + Culture	Arts & Culture

- Items on the Profile tab would not be visible until the user logs in. Top-left box contains the user profile, below which is an "edit profile" link allowing the user to change the user name and the city of residence.
- The bottom-left box displays all the groups that this logged user has joined in. To leave a group, the user can click on the group number which would be shown in the bottom-right box, and then click on "leave".
- Considering that a user might like to create a new group on his own interest, we have the "create a new group" box to satisfy such demand. The user can select a category for the group, type in the group name and group description, and click on "Create" to create a new group. In this case, the member ID would be stored as an organizer ID in the database.





- The Map tab essentially contains the location information of all the events, sorted by states.



The analytics tab serves as a performance monitoring tool for Like-minded management team to have an overall picture of how popular the application is and get insights on users' preferences and activities.

The top section of the analytics tab contains 4 key performance indicators tiles, category, group, event, and member to present a quantitative measurement of primary components of the application. The numbers will change with the insert of new records.



The middle section of the tab is a scatter plot of the new member enrollment count for each month. It provides a view of enrollment in a time series plot, which can be used in analyzing trends and seasonality. For example, the plot shows that the low month and high month for members enrollment is December and January, respectively. Like-minded management team can launch promotions or increase marketing efforts accordingly. The plot can be expanded collapsed based on visual needs.

The bottom left corner is a graphing analytics section that contains three different types of visualization of category popularity, which are bar plot, table, and word cloud. The bar plot shows top categories ranked in descending order by the number of groups within each category. The management team can change the parameter to select how many categories they want to see on the plot.

The filter also applies to the table tab, which presents the same information as the bar plot but in table format. In addition, each category can be clicked then used as a filter to the member count vs. rating scatter plot on the lower right corner. This scatter plot shows the correlation between the number of members for each group within a category and groups' ratings.

The third tab within the graphing analytics section is a word cloud analyzing the category popularity. The bigger the size, the more groups there are within a category. Also, if the management team hover the mouse on the category name, it will show the number of groups.



## Appendix

## Exhibit 2 - Relationship

- A **Categories** consists of one or many **Groups**
- A **Groups** belongs to only one **Categories**
- A **Groups** creates one or many **Events**
- An **Events** is created by only one **Groups**
- A **Cities** has one or many **Groups**
- A **Groups** can be located at only one **Cities**
- A **Cities** has one or many **Members**
- A **Members** can be located at only one **Cities**
- A **Venues** can hold one or many **Events**
- An **Events** can only be held at one **Venues**
- A **Groups** can have many **Members**
- A **Members** can belong to many **Groups**

## Exhibit 3 - Data Dictionary

cities	members	member_group
<ul style="list-style-type: none"><li>city_id INT(11)</li><li>city VARCHAR(45)</li><li>country CHAR(2)</li><li>distance DECIMAL(12,3)</li><li>latitude DECIMAL(12,8)</li><li>localized_country_name VARCHAR(45)</li><li>longitude DECIMAL(12,8)</li><li>member_count INT(11)</li><li>ranking INT(11)</li><li>state CHAR(2)</li><li>zip INT(11)</li></ul>	<ul style="list-style-type: none"><li>member_id INT(11)</li><li>city VARCHAR(45)</li><li>country CHAR(2)</li><li>hometown VARCHAR(45)</li><li>joined DATETIME</li><li>lat DECIMAL(12,8)</li><li>link VARCHAR(200)</li><li>lon DECIMAL(12,8)</li><li>member_name VARCHAR(45)</li><li>state CHAR(2)</li><li>member_status ENUM(...)</li><li>visited DATETIME</li><li>group_id INT(11)</li></ul>	<ul style="list-style-type: none"><li>member_id INT(11)</li><li>group_id INT(11)</li><li>bio VARCHAR(45)</li></ul>
Indexes	Indexes	Indexes

categories
<ul style="list-style-type: none"><li>category_id INT(11)</li><li>category_name VARCHAR(45)</li><li>shortname VARCHAR(45)</li><li>sort_name VARCHAR(45)</li></ul>
Indexes

Exhibit 3 - Data Dictionary (Cont.)

<b>venues</b> <ul style="list-style-type: none"> <li>venue_id INT(11)</li> <li>address_1 VARCHAR(200)</li> <li>address_2 VARCHAR(200)</li> <li>city VARCHAR(45)</li> <li>country CHAR(2)</li> <li>distance DECIMAL(10,2)</li> <li>lat DECIMAL(12,8)</li> <li>localized_country_name VARCHAR(45)</li> <li>lon DECIMAL(12,8)</li> <li>venue_name VARCHAR(300)</li> <li>phone BIGINT(20)</li> <li>state CHAR(2)</li> <li>zip INT(11)</li> </ul>	<b>groups</b> <ul style="list-style-type: none"> <li>group_id INT(11)</li> <li>category_id INT(11)</li> <li>city_id INT(11)</li> <li>created DATETIME</li> <li>description LONGTEXT</li> <li>join_mode ENUM(...)</li> <li>lat DECIMAL(12,8)</li> <li>link VARCHAR(450)</li> <li>lon DECIMAL(12,8)</li> <li>members INT(11)</li> <li>group_name VARCHAR(150)</li> <li>organizer_member_id INT(11)</li> <li>organizer_name VARCHAR(65)</li> <li>rating DECIMAL(4,2)</li> <li>state CHAR(2)</li> <li>timezone VARCHAR(65)</li> <li>urlname VARCHAR(65)</li> <li>utc_offset INT(11)</li> <li>visibility ENUM(...)</li> <li>who VARCHAR(85)</li> </ul>	<b>events</b> <ul style="list-style-type: none"> <li>event_id VARCHAR(75)</li> <li>created DATETIME</li> <li>description LONGTEXT</li> <li>duration INT(11)</li> <li>group_id INT(11)</li> <li>headcount INT(11)</li> <li>how_to_find_us VARCHAR(250)</li> <li>maybe_rsvp_count INT(11)</li> <li>event_name VARCHAR(95)</li> <li>rsvp_limit INT(11)</li> <li>event_status ENUM(...)</li> <li>event_time DATETIME</li> <li>updated DATETIME</li> <li>utc_offset INT(11)</li> <li>venue_id INT(11)</li> <li>visibility ENUM(...)</li> <li>waitlist_count INT(11)</li> <li>yes_rsvp_count INT(11)</li> </ul>
Indexes	Indexes	Indexes