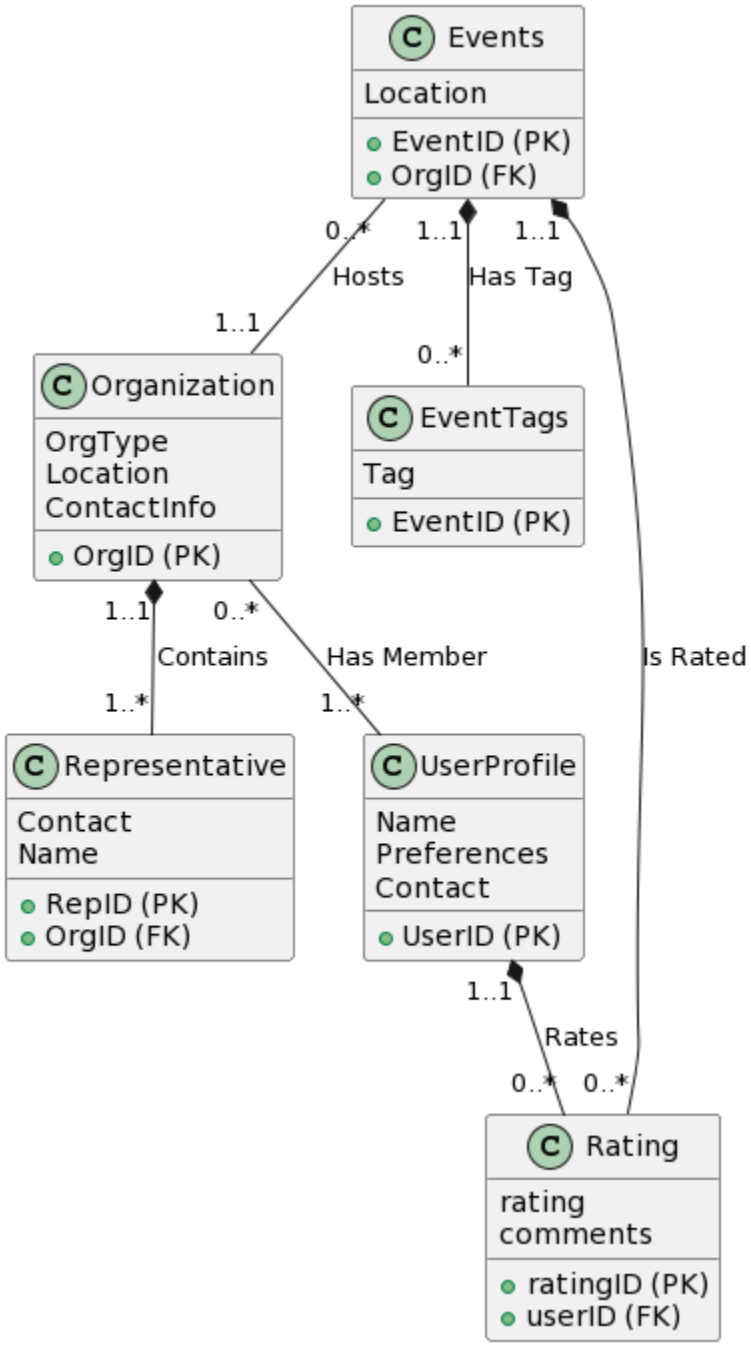
Database Conceptual Design

UML Diagram:



Entities (assumptions):

1. **Organization:**
    a. OrgID (INT)
        i. Primary Key
        ii. Unique Identifier of Organization
    b. OrgName (VARCHAR)
        i. RSO name
    c. OrgType (VARCHAR)
        i. RSO category
        ii. There will be predetermined categories to select from.
    d. Location (VARCHAR)
        i. Location (address)
        ii. Can be NULL (no in-person location/office)
    e. ContactInfo (VARCHAR)
        i. Email address or social media link
        ii. Can be NULL

2. **Representative:**
    a. RepID (INT)
        i. Primary Key
        ii. Unique identifier of particular Organization and UserProfile pair
        iii. Assume that a user can be representative of multiple different organizations.
        iv. Assume that an organization can have multiple representatives (different userProfiles)
    b. OrgID (INT)
        i. Foreign key to Organization. Used to identify which organization being represented.
    c. UserID (INT)
        i. Foreign key to UserProfile. Used to identify which particular user is representing the organization/
        ii. Can be NULL (if particular representative doesn't have UserProfile)
    d. First Name (VARCHAR)
    e. Last Name (VARCHAR)
    f. Contact (VARCHAR): can be NULL

3. **UserProfile:**
    a. UserID (INT)
        i. Primary Key: uniquely identify user profile
    b. First Name (VARCHAR)
    c. Last Name (VARCHAR)
    d. Preferences (VARCHAR): Event and Org Preference: can be used for recommendations.
        i. Choose from predefined categories
        ii. Can be NULL
4. **Event:**
    a. EventID (INT)
        i. Primary Key: uniquely identify event
    b. OrgID (INT)
        i. Foreign Key to Organization. Assume each event can only belong to single organization. Single organization can have multiple distinct events
    c. Location (VARCHAR)
    d. Date (DATETIME)
5. **EventTag:** Weak Entity (dependent on EventID for primary key)
    a. Tag (VARCHAR)
        i. Select from pre-defined options
        ii. Combination of EventID and tag make primary key

Relationships (cardinality):

We start at the UserProfile Table. Here, with primary key UserID, we can have each student in multiple organizations, and multiple students in the same organization (though a student can be in no organization and an organization must have at least one member), so a many-to-many relationship from UserProfie to Organization, from UserID to OrgID.

At the Organization table, we must have at least one representative from Representative for an organization, and each representative must have one organization they represent to be a representative (we are assuming multiple would be an issue of juggling). So this relationship is one-to-many, from RepID and OrgID in Representative to OrgID in Organization. We see a similar relationship between Organization and Events: each organization can hold multiple events, and it would make sense that each event is held by one organization, so this is a one-to-many relationship between OrgID in Organization to EventId and OrgID in Events.

For the Events Table, there are other relations to keep in mind. Events, with its EventID and OrgID will have a one-to-many relation with EventId from EventIDs, since this is a mapping with the topics of the relation, and different topics can be pertained to.

Then we look at the relationship between Events and Ratings: Each event can have multiple ratings for it so that relation is one-to-many.

We also note that UserProfile to Ratings has a one-to-many relationship, since each user can make multiple ratings.

Normalization:

We choose to normalize using 3NF due to its simplicity (as BCNF is just a stricter form of 3NF) as well as attempting to avoid further decomposition.

Our normalized UML diagram is already in 3NF form.
We know it is in 3NF form because every relation has a primary key and all other attributes are dependent on the primary key. Additionally there are obviously no transitional dependencies.

Translated Relational Schema:

Organization (OrgID: INT [PK], OrgName: VARCHAR(255), OrgType: VARCHAR(55), Location: VARCHAR(255), ContactInfo: VARCHAR(100))

Representative (RepID: INT [PK], OrgID: INT [FK to Organization.OrgID], Name: VARCHAR(100), Contact: VARCHAR(100))

UserProfile (UserID: INT [PK], Name: VARCHAR(100), Preferences: VARCHAR(255), Contact: VARCHAR(100))

Events (EventID: INT [PK], OrgID: INT [FK to Organization.OrgID], Location: VARCHAR(100))

EventTags (EventID: INT [PK], Tag: VARCHAR(25))

Rating (ratingID: INT [PK], userID: INT [FK to UserProfile.userID], rating: INT, comments VARCHAR(8192))