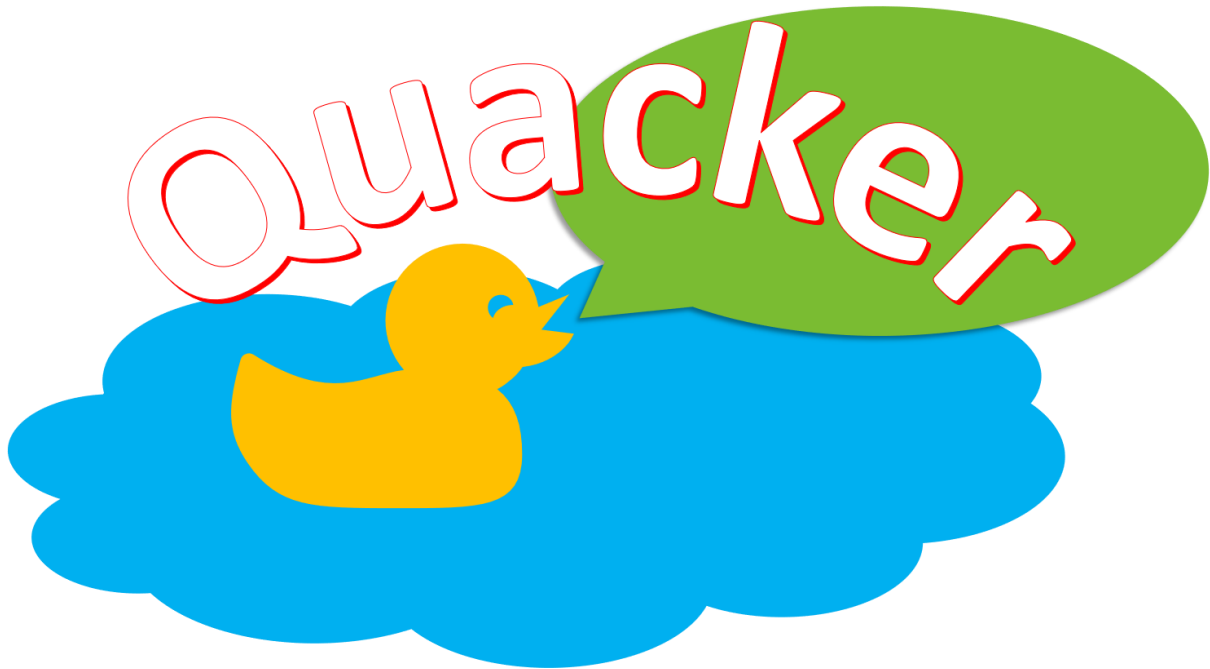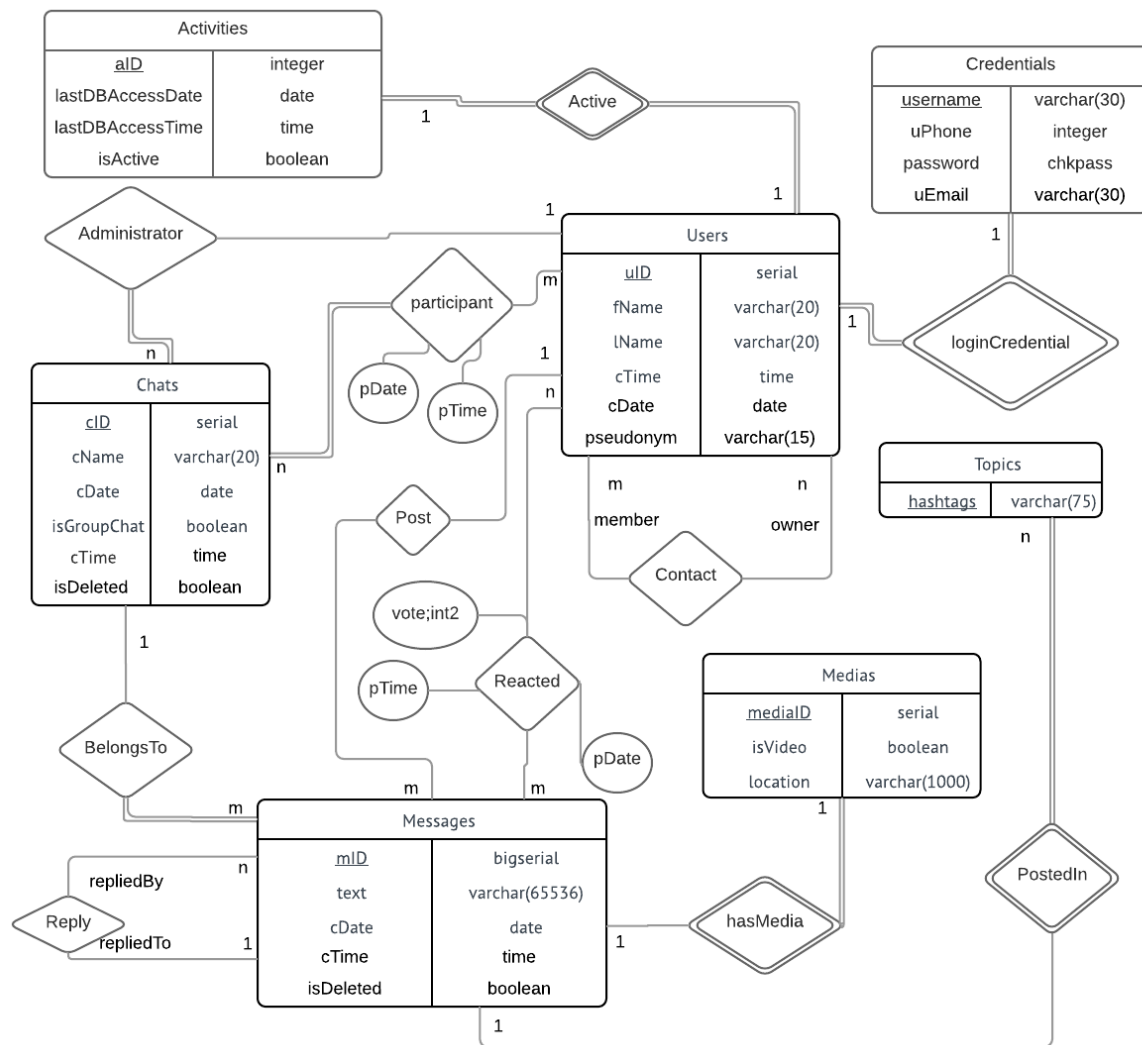University of Puerto Rico, Mayagüez Campus
Department of Electrical and Computer Engineering



*Project Phase 1*

Alberto J. De Jesus: alberto.dejesus@upr.edu
Alejandra Casanova: alejandra.casanova@upr.edu
Jose J. Sanchez: jose.sanchez25@upr.edu

# I. ER Diagram



# II. Entity-Relationship and Attribute Explanations

A. Entities:

1. Users - This entity represent the user's of the quacker application.

   a) Attributes:

      (1) UID:serial Primary Key - User Identification

      (2) FName:varchar(20) - User's first name

      (3) LName:varchar(20) - User's Last name

      (4) CDate:date - Account creation date

      (5) CTime:time - Account creation time

      (6) Pseudonym:varchar(15) - An pseudonym for the user to use if they wish to not use their real name.

2. Credentials - A weak entity dependant of User that holds the login credentials for security.
   a) Attributes:
      (1) Username:varchar(30) partial key - User's login username
      (2) UPhone:char(10) - User's registered phone number
      (3) UEmail:varchar(30) - User's email address
      (4) Password:chkpass - User's login password
3. Activities - A weak entity dependant of User that contains the necessary information to determine if an user is active or not.
   a) Attributes:
      (1) ActiveID:serial partial key - An id to identify an active account.
      (2) isActive:boolean - It determines if a user account is still an active account.
      (3) lastDbAccessDate: Date - The date of the last time the user accessed the database.
      (4) lastDbAccessTime:Time - The time of the last time the user accessed the database.
4. Chats - An entity that contains the information related to a chat or chat group.
   a) Attributes:
      (1) CID:serial primary key - Chat ID
      (2) CName:varchar(20) - Chat name
      (3) CDate:date - Chat's creation date
      (4) CTime:time Chat's creation time
      (5) isGroup:boolean - Determines if the chat is a group chat or not.
      (6) isActive:boolean - Determines if a chat has been deleted or not.
5. Messages - An entity that represents a message sent in a chat.
   a) Attributes:
      (1) MID:bigserial primary key - Message ID
      (2) Text:varchar(65536) - Text in a message

         (3) CDate:date - Date of the posted message

         (4) CTime:time - Time of the posted massage

         (5) isDeleted:boolean - Determines if a message has been deleted.

6. Medias - A weak entity of Message, it manages the images that a message might include.
   a) Attributes:
      (1) MediaID:Serial partial key - Media ID
      (2) isVideo:boolean - determines if the media is a video or a photo.
      (3) Location:varchar(1000) - The address of the media in question.

7. Topics - A weak entity of Message, it contains any topics mentioned in the messages.
   a) Attributes:
      (1) Hashtag:varchar(75) - The topic mentioned in the chat.

B. Relationships:
   1. LoginCredentials - A relationship between User and Credential. An user uses the credentials to login into the app.
      a) Participation:
         (1) Users: Total participation
         (2) Credentials: Total participation
      b) Cardinality: 1 to 1
   2. Active - A relationship between User and Activity. An user needs to have an active or inactive mode.
      a) Participation:
         (1) Users: Total participation
         (2) Activities: Total participation
      b) Cardinality: 1 to 1
   3. Contact - A self relationship with User. An user has a contact list composed of other users.
      a) Participation:
         (1) Owner: Partial participation
         (2) Member: Partial participation
      b) Cardinality: Many to Many

4. Post - A relationship between User and Message. The user posts messages.
    a) Participation:
        (1) Users: Partial participation
        (2) Messages: Total participation
    b) Cardinality: Many to 1
5. Participant - A relationship between User and Chat. A chat must contain users to exist.
    a) Participation:
        (1) Users: Partial participation
        (2) Chats: Total participation
    b) Cardinality: Many to Many
    c) Attributes:
        (1) PDate:date - Date an user got added to a chat
        (2) PTime:time - Time an user got added to a chat
6. Administrator - A relationship between User and Chat. A chat has as an admin the user that created it.
    a) Participation:
        (1) Users: Partial participation
        (2) Chats: Total participation
    b) Cardinality: 1 to Many
7. Reacted - A relationship between User and Message. An user reacts to a message by liking or disliking it.
    a) Participation:
        (1) Users: Partial participation
        (2) Messages: Partial participation
    b) Cardinality: Many to Many
    c) Attributes:
        (1) RDate:date - Date an user reacted to a message
        (2) RTime:time - Time an user reacted to a message
        (3) Vote:short - The vote a user gave to a message, 1 for like and -1 for dislike.
8. BelongsTo - A relationship between Chat and Message. A message belongs to a chat for it to be displayed in.
    a) Participation:
        (1) Chats: Partial participation
        (2) Messages: Total participation

b) Cardinality: 1 to Many

9. Reply - A self relationship with Message. A message can reply another message.
   a) Participation:
      (1) RepliedBy: Partial participation
      (2) Replied_To: Partial participation
   b) Cardinality: Many to 1

10. HasMedia - A relationship between Message and Media. A message can contain 1 media content video or photo.
    a) Participation:
       (1) Messages: Partial participation
       (2) Medias: Total participation
    b) Cardinality: 1 to 1

11. PostedIn - A relationship between Message and Topic. A message can contain multiple topics depicted with hashtags.
    a) Participation:
       (1) Messages: Partial participation
       (2) Topics: Total participation
    b) Cardinality: 1 to Many

# III.  SQL Create Table Commands

create table User(uid serial primary key, fname varchar (20), lname varchar(20), cdate date, ctime time, pseudonym varchar(15));

create table Credentials(uid integer references User(uid), username varchar(30) unique, password chkpass, uemail varchar(30) unique, uphone char(10), primary key(uid, username));

create table Activity(aid integer references User(uid), lastdbaccessdate date, lastdbaccesstime time,  isActive boolean, primary key(uid, aid));

create table Contact(ownerid integer references User(uid), memberid integer references User(uid), primary key(ownerid, memberid));

create table Chat(cid serial primary key, cname varchar(20), cdate date, ctime time, isgroupchat boolean, isactive boolean, adminid integer references User(uid));

create table Participant( cid integer references Chat(cid), uid integer references User(uid), pdate date, ptime time, primary key(uid, cid));

create table Message(mid bigserial primary key, text varchar(65536), cdate:date, ctime time, uid integer references User(uid), cid integer references Chat(cid), isDeleted boolean, rid references Messages(mid));

create table Topic(hashtag varchar (75), mid integer references Message(mid), primary key (mid, hashtag));

create table Reacted(uid integer references User(uid), mid integer references Message(mid), rdate date, rtime time, vote smallint, primary key (uid, mid), check (vote = 1 OR vote = -1));

create table Media(mid integer references Message(mid), mediaid serial, isvideo boolean, location varchar(1000), primary key (mid, medid));