Database Systems, CSCI 4380-01
Homework # 3
Due Monday September 27, 2021 at 11:59:59 PM

Homework Statement. This homework is worth 3% of your total grade. This homework is optional. If you choose to skip it, Midterm #1 will be worth 3% more.

Remember, practice is extremely important to do well in this class. I recommend that not only you solve this homework in its entirety, but also work on homeworks from past semesters, which can be found here:

http://cs.rpi.edu/~sibel/DBS_Past_Materials/

This homework aims to test ER-diagrams and builds on normalization theory.

I dedicate this homework to WRPI. May you continue to be the joy in our lives.

Question 1. Create an ER diagram for a company that manages multiple radio stations. Your database will help different radio programs to create, store and reuse programs. The database will contain the following information (please try to represent these requirements as best as you can, but do not alter them):

There are number of radio stations identified uniquely by the call sign and zipcode. Each station has an FM frequency, transmission radius, URL, station manager name and email.

There are DJs. Each DJ is identified with a name, salary, start date, nickname, multiple music styles, tone of voice, multiple favorite artists.

There are shows, each show has an id, name, duration and regular air times. Each air time is given by day of week and start time.

There are programs, which are specific episodes of each show. Each program has a specific air date and notes.

There are artists. Each artist is identified by an id. Artists have name, date of birth, nationality and a number of music genres they play.

There are albums. Each album is identified by an id. Albums have name, year of release, publisher, multiple format available (CD/Vinyl).

There are tracks identified by an id. Tracks have names and number. Each track is from a specific album. Each track is by zero or more artists. Artists and albums can have many tracks.

Shows are for a specific radio station and stations have many shows. Each show has one and only DJ, but DJs can have many shows.

Each program is for a specific show and shows have many programs.

Each program features a set of songs and songs can be in many shows. For each song in a program, we have its order number.

Question 2. In this question, you are given the ER model below based on a mutual-aid network, from a question in last year's homework. In mutual aid networks, groups of people come together

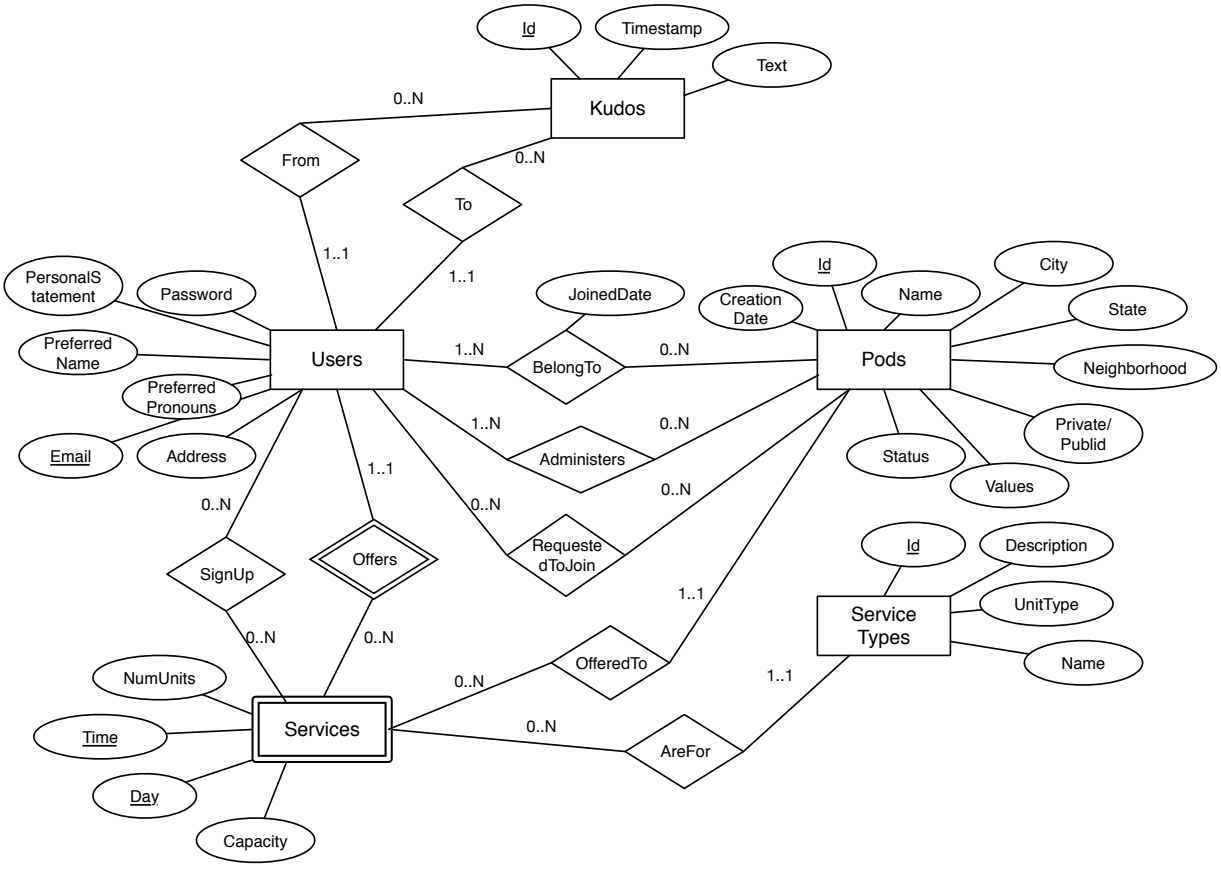

Figure 1: ER Diagram for Question 2

to support each other, by pooling their resources in terms of time and skills, communicating with each other about their constraints such as risk tolerance, etc.

Convert this model to relational data model and list all your tables, as well as keys for each relation. Use the ER diagram as your guide, do not change things that are not on the diagram based on your intuitions.

SUBMISSION INSTRUCTIONS. Submit a single PDF document for this homework using Submitty. No other format please. No late submissions will be allowed.

I will allow hand written ER diagrams only if they exhibit great handwriting that is easy to read.

If you want to draw ER diagrams using software, I used good old Powerpoint (or Google slides) for quite a while and then migrated to OmniGraffle (Mac Os specific). OmniGraffle works well for me. You can find other software online, but beware that they might have different notation which we cannot decipher easily. I prefer that you give us readable hand written ER diagrams instead of non-standard notation.