Database Systems, CSCI 4380-01
Homework # 3 Answers

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. Additionall DJs have 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. The id is unique. 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 tracks and tracks can be in many programs. For each track in a program, we have its order number.

Answer. The answer is given in Figure 1.

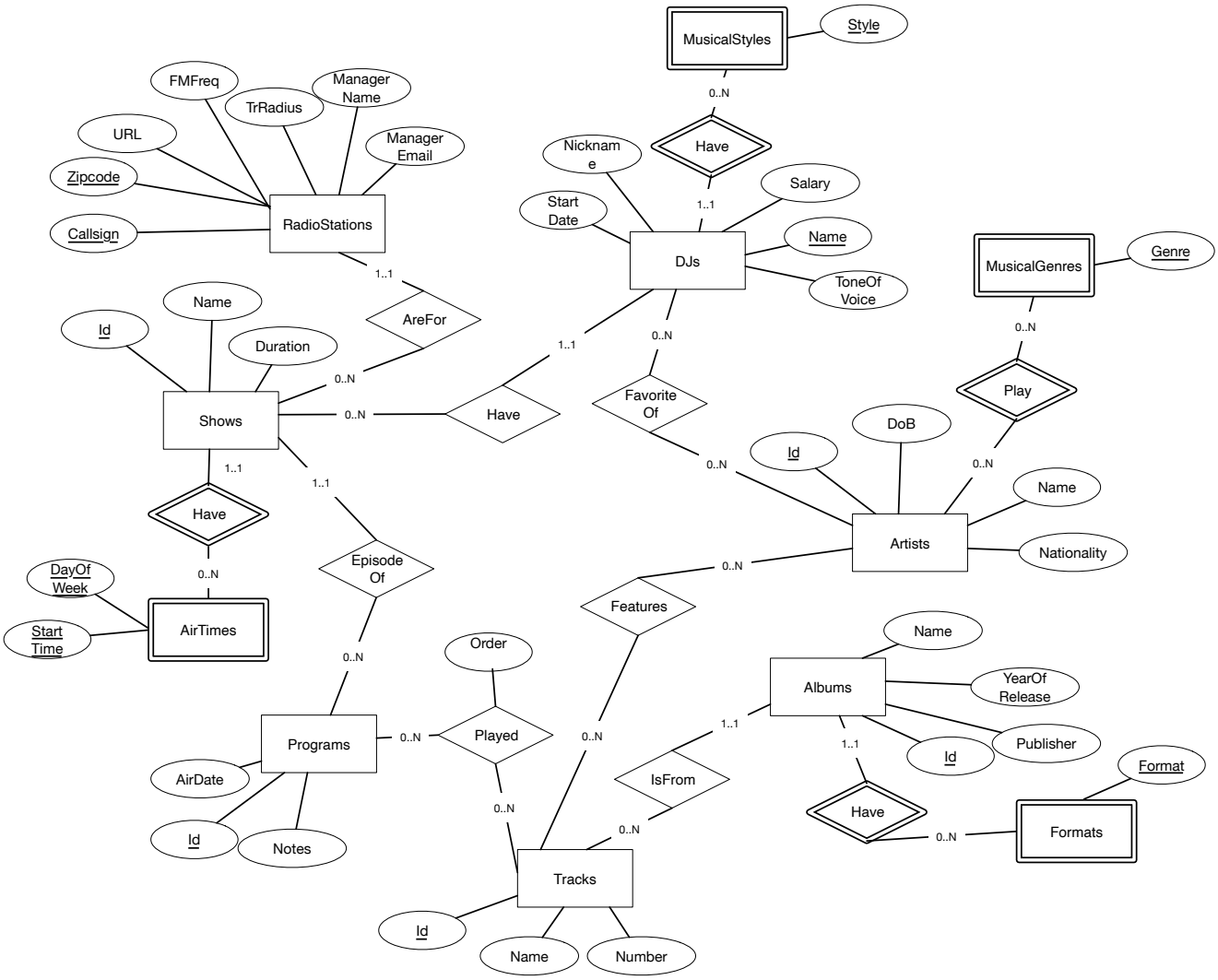

Figure 1: ER Diagram for Question 1

Note that the only assumption made in the above model is that a given track is only played once in a single program. If this is not true, then a different model is needed. The solution below solves this problem, since it simply says that the order of a specific track in a specific program is unique.

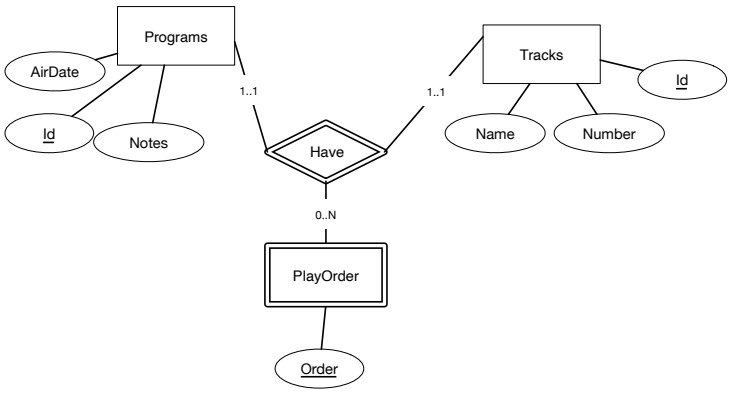

Figure 2: ER Diagram for Question 1 - Alternate solution that allows a track to be played more than once in a program

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 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.

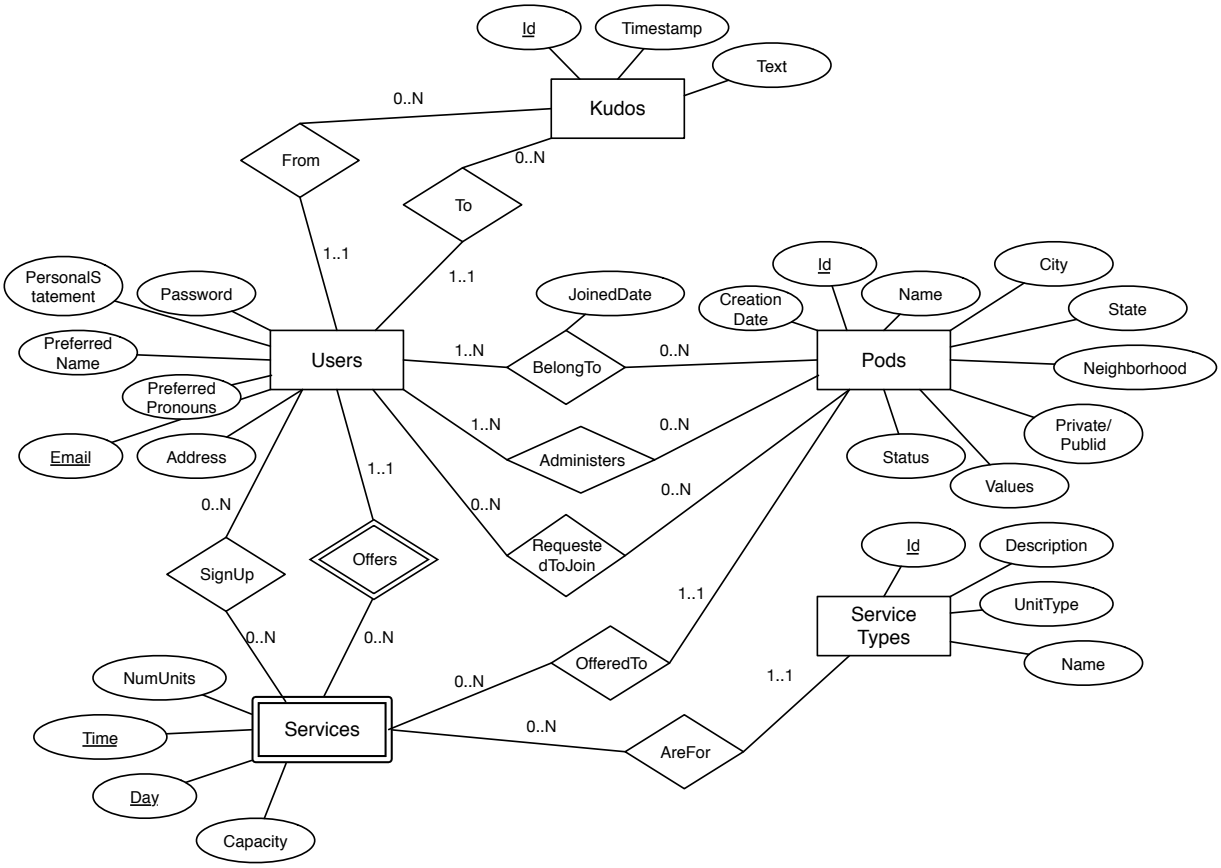

Figure 3: ER Diagram for Question 2

Answer.

Kudos(Id, Timestamp, Text, FromUserEmail, ToUserEmail)

Users (Email,PreferredPronuns, PreferredName, PersonalStatement, Password, Address)

Pods(Id,Name, City, State, Neighborhood, PrivatePublic, Values, Status, CreationDate)

ServiceTypes(Id, Description, UnitType, Name)

Services(Time, Day, OfferedByUserEmail, NumUnits, Capacity, OfferedToPodId, ForServiceTypeId)

Signup(Time, Day, OfferedByUserEmail, SignedUpUserEmail)

RequestedToJoin(UserEmail, PodId)

Administers(UserEmail, PodId)

BelongTo(UserEmail, PodId, JoinedDate)