CS-322 Introduction to Database Systems
Project Deliverable #2
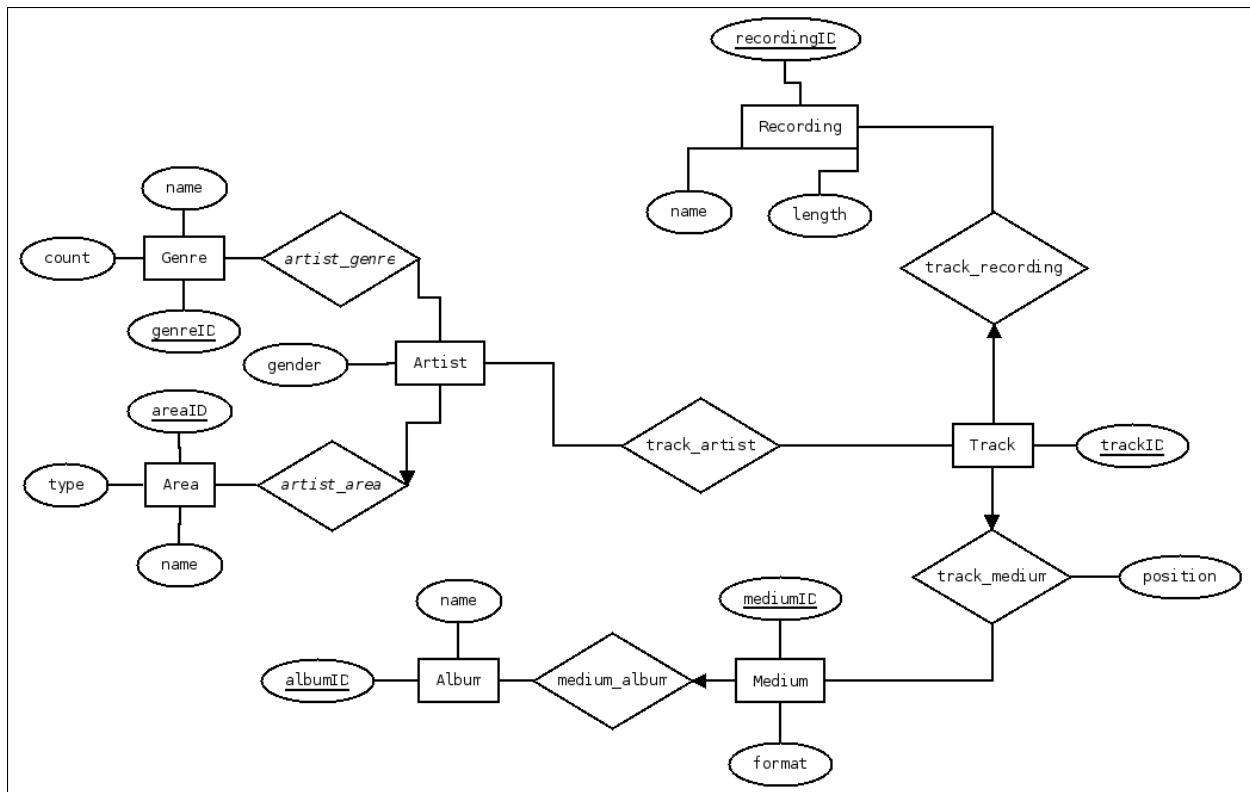
Due on Sunday, May 4th, 2014

Group 24
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ER model for music database

SQL DDL code for table creations

```
CREATE TABLE Areas (
  areaID INTEGER,
  name VARCHAR(255) NOT NULL,
  type VARCHAR(255),
5  PRIMARY KEY (areaID) ) ;

CREATE TABLE Genres (
  genreID INTEGER,
  name VARCHAR(255) NOT NULL,
10  count  INTEGER DEFAULT 0,
  PRIMARY KEY (genreID) ) ;

CREATE TABLE Artists (
  artistID INTEGER,
15  name VARCHAR(255) NOT NULL,
  areaID INTEGER,
  gender CHAR(1),
  PRIMARY KEY (artistID),
  FOREIGN KEY (areaID) REFERENCES Areas ) ;
20

CREATE TABLE Recordings (
  recordingID INTEGER,
```

```
      name VARCHAR(255) ,
25    length INTEGER,
      PRIMARY KEY (recordingID) ) ;




30 CREATE TABLE Albums (
      albumID INTEGER,
      name VARCHAR(255) NOT NULL,
      PRIMARY KEY (albumID) ) ;

35 CREATE TABLE Mediums (
      mediumID INTEGER,
      albumID INTEGER,
      format VARCHAR(255),
      PRIMARY KEY (mediumID),
40    FOREIGN KEY (albumID) REFERENCES Albums ) ;


   CREATE TABLE Tracks (
      trackID INTEGER,
45    mediumID INTEGER,
      recordingID INTEGER,
      position INTEGER,
      PRIMARY KEY (trackID),
      FOREIGN KEY (mediumID) REFERENCES Mediums,
50    FOREIGN KEY (recordingID) REFERENCES Recordings ) ;
```

SQL script for entities table creation

```
   CREATE TABLE Artist_genre (
      artistID INTEGER,
      genreID INTEGER,
      PRIMARY KEY (artistID, genreID),
5     FOREIGN KEY (artistID) REFERENCES Artists,
      FOREIGN KEY (genreID) REFERENCES Genres ) ;



   CREATE TABLE Track_artist (
10    artistID INTEGER,
      trackID INTEGER,
      PRIMARY KEY (artistID, trackID),
      FOREIGN KEY (trackID) REFERENCES Tracks ,
      FOREIGN KEY (artistID) REFERENCES Artists ) ;
```

SQL script for relations table creation

Design choices & data constraints

There are three main concepts in our music database : **Song**, **Artist** and **Album**. Both **Song** and **Album** were divided between their descriptive data and their physical incarnation. We decided to enforce **Song** as the only necessary information to describe music, emulating the approach taken by most popular music player softwares since data can be incomplete. We put a NOT NULL constraint on most of the name attributes of the entities, with the exception of **Song** for the reason just stated. Since they are not required fields to describe music, they should have a valid name when they are in fact used.

- A **Song** is related to:

    Artist: A song can exist without known artists, but can also have several artists to describe collaborations.

    Medium: Though a song is not necessarily part of an album, it has to be recorded on some medium. There is therefore a participation constraint of **Song** in **Medium**. Their relation is characterized by the track position on the medium.

- An **Artist** is defined by a:

    Genre: A genre can regroup multiple artists, but makes no sense as an empty container, thus triggering a participation constraint, whereas an artist can be difficult to define as catering to a specific genre, or crossing boundaries between genres nullifying the need for a constraint. We kept the count attribute, choosing small update costs over on-demand higher computation costs.

    Area: An artist's location can be pinpointed to a specific creation grounds, hence can be expressed by a foreign key constraint. But several artists can be compelled to share their musical feelings in the same studio, and a place which doesn't house such a creative conundrum isn't worth keeping track of in a music database.

- An **Album** is the logical aggregation of songs, labeled by a title, and can be recorded on multiple — at least one, participation constraint— media. Conversely, a medium identifies a singular recording of an album, enforced by a foreign key constraint.

Some constraints, the integrity of the count attribute in **Genre** and the several "at least one" constraints, are not guaranteed by the table creation. They will later be enforced later on by the import and delete data commands.

SQL Queries

```sql
SELECT a.name
FROM artists a, areas l
WHERE a.areaID=l.areaID AND l.name='Switzerland' ;
```

SQL script for query A

```sql
SELECT a.type, l.name,
FROM Areas l, Artists a
GROUP BY a.areaID
```

SQL script for query B

SQL script for query C

SQL script for query D

SQL script for query E

SQL script for query F

SQL script for query G

Interface