

MySQL Database

1. Mini-world Description

The group elected to base our mini-world on a music streaming platform for the group assignment. The database keeps track of multiple entities including Individual, Artist, Album, Song, Playlist, Writer, Recording label, Account as well as multiple Genre classes (pop, rock and jazz). These Genres are designed as subclasses to allocate differing attributes unique to a Genre that facilitate listener personalisation.

- Individuals are users of the music streaming platform that may be Artists as well as listeners. Each Individual can create one or more Account and has the option of being an Artist. Individuals have their unique User ID and name stored in order to differentiate them to allow for a personalised experience. An Individual can also have any number of Playlists of which they have created.
- In an Album, a given Song can appear only once, but the Album can have many Songs. Each Album can be released by a Recording label. When an Album is released by a Recording label, the Album's release date is recorded. An Album has the attributes Album ID; a unique identifying value, and title; the name of the Album.
- A Recording label is uniquely identifiable by the Label name paired with the Label branch. A Recording label can release any number of Songs, and has only the Label name and Label branch attributes recorded.
- A Writer can write many Songs. Each Writer has a unique Writer ID which is used as the main identification and a Writer name which is displayed on the Song.
- An artist must be an Individual, can feature on any number of songs, and can be the lead artist on any number of songs. The Artist attributes tracked for the sake of personalisation include a unique Artist ID, the Artist name, and the Artist's aliases, allowing for the Artist to be found by any of their aliases.
- A Playlist has to have been created by any number of Individuals and must also feature a number of Songs. The playlist is identified by a unique playlist ID and a playlist name.
- A Song is identifiable by its unique track ID. As well as this, the Song's release date and name are kept track of to provide information to the listener. Finally, the Songs Genre is recorded as a sub attribute due to the combinatorial nature and different attributes relating to the individual Genres. The Genre subclasses, Pop, Rock and Jazz, can be overlapping. The Genre Pop has the beats per minute value recorded, Rock whether or not it is purely instrumental - containing vocals or not, and Jazz has the jazz styles utilised recorded. Each Song must have at least one lead Artist, and can feature any number of other Artists. A Song must be written by at least one Writer, can belong to one Album and can be a part of any number of Playlists.
- An Account can **only be associated with one Individual**, where an Individual can hold many Accounts. Each Account holds all of; a unique Account ID to differentiate between accounts, a **User ID** to link the Account to the owning Individual, an email for contact purposes and account retrieval, and a birth date for account personalisation and music age restrictions.

2. Entities and Attributes

INDIVIDUAL

Name: Composite (Fname, Lname), Single-valued, String

User_ID: Simple, Single-valued, String, Key-attribute

ARTIST

Artist_name: Simple, Single-valued, String
Artist_ID: Simple, Single-valued, Integer, Key-attribute
Aliases: Simple, Multi-valued, String

ALBUM

Album_ID: Simple, Single-valued, Integer, Key-attribute
Title: Simple, Single-valued, String

SONG (Superclass)

Track_ID: Simple, Single-valued, Integer, Key-attribute
Song_Name: Simple, Single-valued, String
Num_Artists: Derived, Single-valued, Integer
Date_released: Simple, Single-valued, Date
Genre: Simple, Multi-valued, Overlapping, Subclass

POP (Subclass of SONG)

BPM: Simple, Single-valued, Integer

ROCK (Subclass of SONG)

Vocals: Simple, Single-valued, Boolean

JAZZ (Subclass of SONG)

Jazz_Style: Simple, Multi-valued, String

PLAYLIST

Playlist_name: Simple, Single-valued, String
Playlist_ID: Simple, Single-valued, Integer, Key-attribute

WRITER

Writer_name: Simple, Single-valued, String
Writer_ID: Simple, Single-valued, Integer, Key-attribute

RECORDING_LABEL

Label_name: Simple, Single-valued, String, Key-attribute
Label_Branch: Simple, Single-valued, String, Key-attribute

ACCOUNT (weak entity)

User_ID: Simple, Single-valued, String, Foreign Key-attribute
Email: Simple, Single-valued, String, Unique
Birth_Date: Simple, Single-valued, Date

3. Relationships

- Is_Artist
 - 1:1 relationship
 - An individual can be only one artist, and an artist can be only one individual
 - INDIVIDUAL is partial participation: ARTIST is total participation.
- Playlists
 - M:N relationship
 - An individual can have any number of playlists, and a playlist can belong to any number of individuals
 - INDIVIDUAL is partial participation: PLAYLIST is total participation

- Features_On
 - M:N relationship
 - Any number of artists can feature on a song, and a song can have any number of features
 - ARTIST is partial participation: SONG is partial participation
- Lead_Artist
 - 1:N relationship
 - A song can have only one lead artist, and an artist can be the lead artist on any number of songs
 - ARTIST is partial participation: SONG is total participation
- Playlist_Songs
 - M:N relationship
 - A playlist can contain any number of songs, and a song can be present on a playlist any number of times
 - PLAYLIST is total participation: SONG is partial participation
- Album_Songs
 - 1:N relationship
 - An album can contain any number of songs, and a song can be in only one album
 - ALBUM is total participation: SONG is partial participation
- Writes
 - M:N relationship
 - A writer can write any number of songs, and a song can be written by any number of writers
 - WRITER is total participation: SONG is total participation
- Releases
 - 1:N relationship
 - A record label can release any number of albums, and an album can be released by only one record label
 - Has an attribute *Release_date* of date type for keeping track of the release date of the album
 - RECORDING_LABEL is total participation: ALBUM is partial participation
- Accounts_Of (identifying relationship)
 - 1:N relationship
 - An individual can have multiple accounts, and each account is the account of only one individual
 - INDIVIDUAL is total participation: ACCOUNT is total participation
- Genre (Subclass)
 - Overlapping constraint
 - A song can have any number of genres
 - Any attributes of a selected subclass are inherited by the superclass SONG
 - SONG is total participation: every entity must be a member of at least one subclass

4. ER-diagram

