

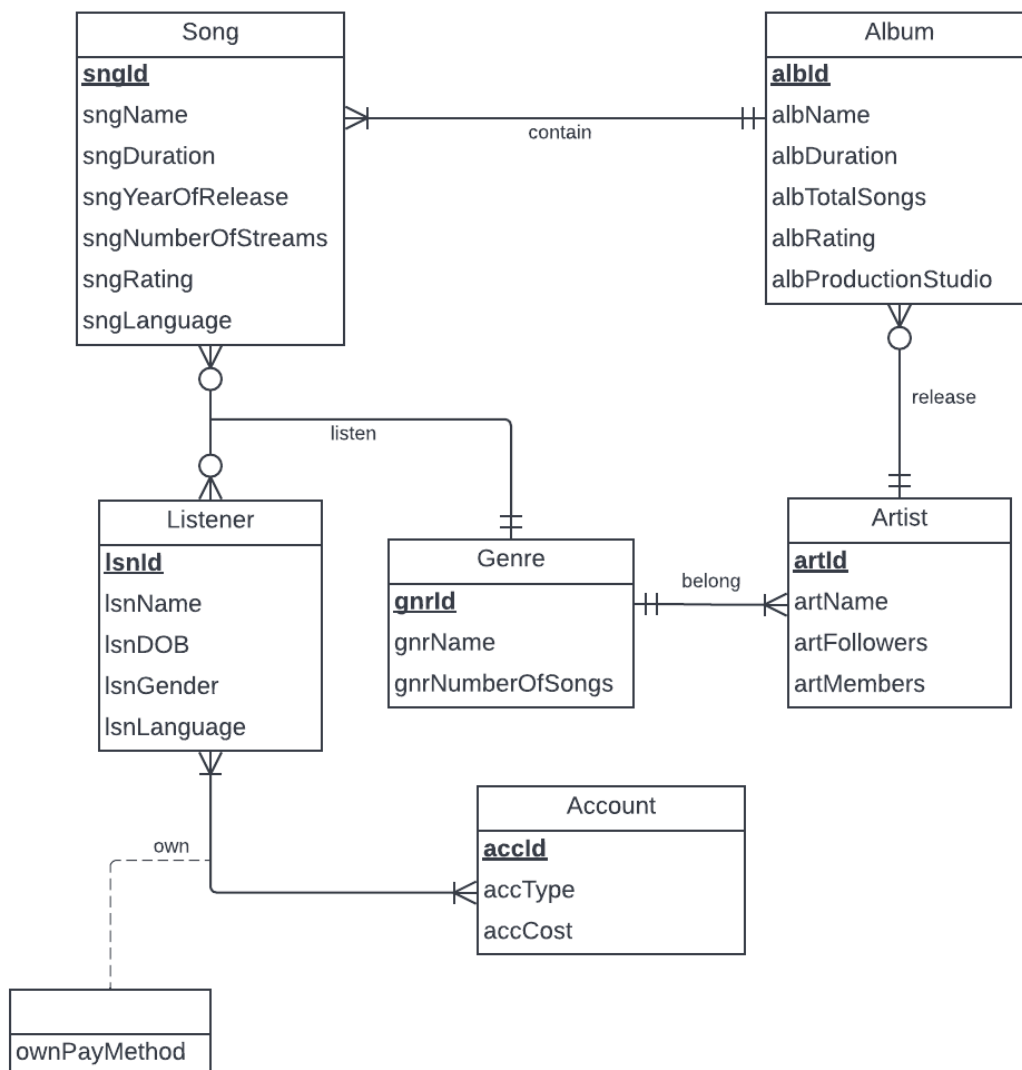
Mission Statement

To provide an improved database of music streaming services to enhance member's experience and build insights from user behavior

Mission Objective

- To find the most popular artist among users of different age groups.
- To find the most active users to suggest customized plans and targeted advertisements.
- To create a playlist of 50 most popular songs.
- To find the most popular band based on genre.
- To find how many users listen to songs other than the selected language.

Extreme.Lee ER Diagram
by Group 04



ER Schema:

Entities, Attributes and Primary Keys

Song (**sngId**, sngName, sngYearRelease, sngDuration, sngNoStreams, sngRating, sngLanguage)

Album (**albId**, albName, albDuration, albRating, albProdStudio, albTotalSongs)

Artist (**artId**, artName, artMembers, artFollowers)

Listener (**lsnId**, lsnName, lsnDOB, lsnGender, lsnLanguage)

Genre (**gnrId**, gnrName, gnrNoOfSongs)

Account (**accId**, accType, accCost)

Relationships, Attributes, Degrees, Participating Entities and Constraints:

Contain : binary relationship

1 album to 1 or many songs

1 song to 0 or 1 album

Release : binary relationship

1 artist to 0 or more albums

1 album to 1 artists

Own : binary relationship

1 listener to 1 or more accounts

1 account to 1 or more listeners

Belong : binary relationship

1 artist belongs to 1 genre only

1 genre can have 1 or more artists

Listen : ternary relationship

1 listener and 1 song to 1 genre

1 listener and 1 genre to 0 or more songs

1 song and 1 genre to 0 or more listeners

Convert ER Diagram to Relational Schema

Genre (**gnrId**, gnrName)

Artist (**artId**, *gnrId*, artName, artFollowers, artMembers)

Album (**albId**, *artId*, albName, albDuration, albRating, albProdStudio)

Song (**sngId**, *albId*, sngName, sngDuration, sngYearOfRelease, sngNoStreams, sngRating, sngLanguage)

Listener (**lsnId**, lsnName, lsnDOB, lsnGender, lsnLanguage)

Account (**accId**, accType, accCost)

Own (**lsnId**, *accId*, ownPayMethod)

Listen (lsnld, snqld, gnrld)

Determine functional dependencies and verify normalization to 3NF

We don't have multi-valued partial dependencies or functional dependencies in our database and therefore it is in 3NF form.

Business rules:

- [R1] A song contained in an album cannot be deleted from the database.
- [R2] A song contained in an album cannot be updated once it's out.
- [R3] An album containing a particular song cannot be deleted from the database.
- [R4] The information of an album containing songs cannot be updated.
- [R5] Once an artist's contract is terminated with the streaming service, their information must also be deleted.
- [R6] The information of an artist releasing a song must be updated in the database when the artist's information is updated.
- [R7] Once an album is released by an artist, it cannot be deleted in the database.
- [R8] The information of an album released by an artist cannot be updated once the album has been released.
- [R9] If a listener owning an account unsubscribes from the service, their information is also deleted from the database.
- [R10] If the details of a listener owning an account are changed, they must reflect in the database accordingly.
- [R11] If an account owned by a listener is deactivated then it must be deleted from the database.
- [R12] If a listener changes his/her account then the account must be updated in the database.
- [R13] Once an artist belonging to a genre ends his contract with the streaming platform, their information must be deleted in the database.
- [R14] The details of an artist belonging to one genre cannot be changed.
- [R15] The genre of an artist cannot be deleted.
- [R16] The genre of an artist cannot be updated.
- [R17] The information of a listener listening to a song of a genre must be deleted in the database if the listener is deleted.
- [R18] The information of a listener listening to a song of a genre must be updated in the database if the listener is updated.
- [R19] A song of a particular genre being listened to by a listener should not be allowed to be deleted.
- [R20] A song of a particular genre being listened to by a listener cannot be updated
- [R21] A genre of a song being listened to by a listener cannot be deleted.
- [R22] No updates can be made to a genre of a song being listened to by a listener.

Referential integrities:

Relation	Foreign Key	Base Relation	Primary Key	Business Rule	Constraint: ON DELETE	Business Rule	Constraint: ON UPDATE
Contains	sngId	Song	sngId	R1	NO ACTION	R2	NO ACTION
Contains	albId	Album	albId	R3	NO ACTION	R4	NO ACTION
Release	artId	Artist	artId	R5	CASCADE	R6	NO ACTION
Release	albId	Album	albId	R7	NO ACTION	R8	NO ACTION
Own	lsnId	Listener	lsnId	R9	CASCADE	R10	CASCADE
Own	accId	Account	accId	R11	CASCADE	R12	CASCADE
Belong	artId	Artist	artId	R13	CASCADE	R14	NO ACTION
Belong	gnrId	Genre	gnrId	R15	NO ACTION	R16	NO ACTION
Listen	lsnId	Listener	lsnId	R17	CASCADE	R18	CASCADE
Listen	sngId	Song	sngId	R19	NO ACTION	R20	NO ACTION
Listen	gnrId	Genre	gnrId	R21	NO ACTION	R22	NO ACTION

Sample Data:Song:

sngId : S090337002

sngName : 'Space Bound'

sngDuration : 4:24

sngYearOfRelease : 2010

sngNoStreams : 300,000,000

sngRating : 4.8

sngLanguage : 'English'

Album:

albId : AL01281109

albName : 'Recovery'

albDuration: 76.56

albRating: 4.3

albProdStudio: 'Effigy (Detroit)'

Listener:

IsnId : L045569086

IsnName : 'Tom Cruise'

IsnDOB : 07/03/1970

IsnGender : 'Male'

IsnLanguage : 'English'

Genre:

gnrId : G0508

gnrName : Rap

Artist:

artId : AR7408689

artName : 'Eminem'

artFollowers : 60,000,000

artMembers : 1

Account:

accId : AC9043273

accType : 'student'

accCost : '5.99\$/month'

accPayMethod : 'credit card'

Contains:

sngId: S90337002

albId: AL1281109

Release:

artId: AR7408689

albId: AL1281109

Own:

IsnId: L45569086

accId: AC9043273

Belong:

artId: AR7408689

gnrId: G24457890

Listen:

lsnId: L45569086

sngId: S90337002

gnrId: G24457890