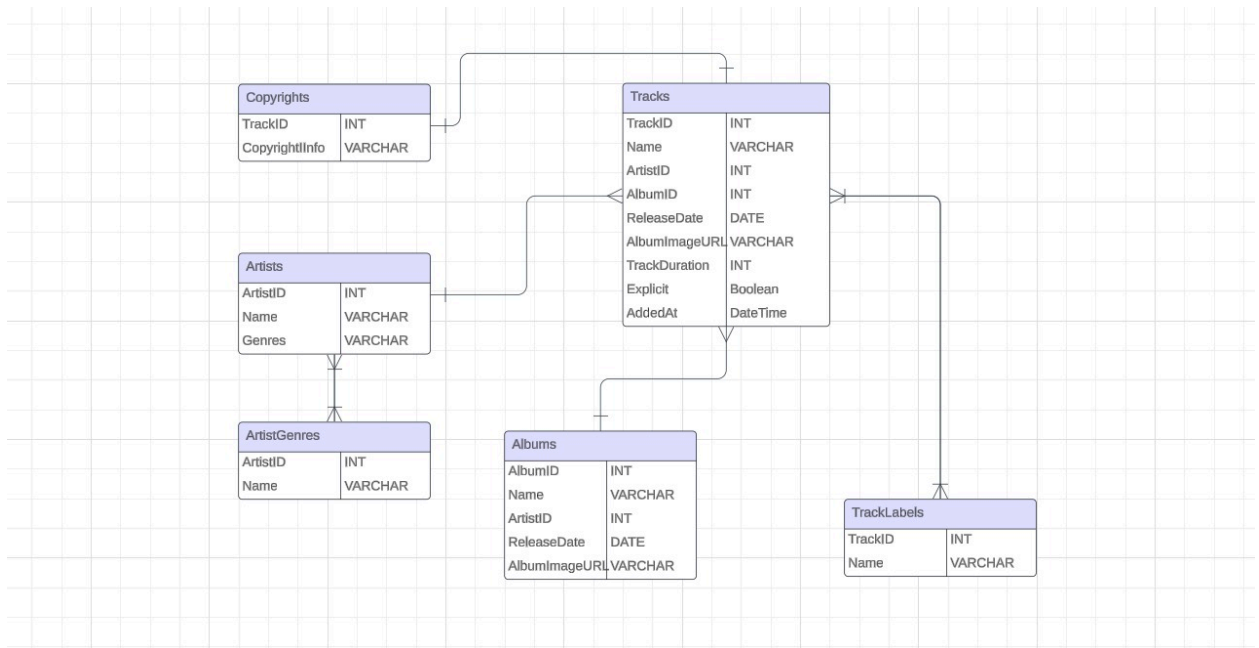


DB Design

Database Design

1. Create Conceptual Diagram/Schema for database - by Atharva



This is how the tables can be created

```
CREATE TABLE Tracks (  
  TrackId INT AUTO_INCREMENT PRIMARY KEY,  
  Name VARCHAR(255) NOT NULL,  
  ArtistId INT NOT NULL,  
  AlbumId INT NOT NULL,  
  ReleaseDate DATE,  
  AlbumImageUrl VARCHAR(255),  
  TrackDuration INT,  
  Explicit TINYINT(1),  
  AddedAt DATETIME,  
  FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId),  
  FOREIGN KEY (AlbumId) REFERENCES Albums(AlbumId)  
);
```

```
CREATE TABLE Artists (  
  ArtistId INT AUTO_INCREMENT PRIMARY KEY,  
  Name VARCHAR(255) NOT NULL,  
  Genres VARCHAR(255)
```

```

    ArtistId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL
);

CREATE TABLE Albums (
    AlbumId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    ArtistId INT NOT NULL,
    ReleaseDate DATE,
    AlbumImageUrl VARCHAR(255),
    FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId)
);

CREATE TABLE ArtistGenres (
    ArtistId INT NOT NULL,
    Genre VARCHAR(255) NOT NULL,
    FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId)
);

CREATE TABLE Labels (
    LabelId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL
);

CREATE TABLE TrackLabels (
    TrackId INT NOT NULL,
    LabelId INT NOT NULL,
    FOREIGN KEY (TrackId) REFERENCES Tracks(TrackId),
    FOREIGN KEY (LabelId) REFERENCES Labels(LabelId)
);

CREATE TABLE Copyrights (
    TrackId INT NOT NULL,
    CopyrightInfo TEXT,
    FOREIGN KEY (TrackId) REFERENCES Tracks(TrackId)
);

```

2. Database (Constraints & Data Types) - by Atharva

Enforcing No Null Values (NOT NULL):

Tracks.ArtistId: This column should never be null. Every track must be associated with a valid artist in the Artists table.

Tracks.AlbumId: Similar to ArtistId, every track should belong to a specific album in the Albums table.

Artists.Name: The artist's name should not be empty.

Uniqueness (UNIQUE):

Tracks.Name + Albums.Id: This combined constraint can ensure a unique combination of track name within an album. No duplicate track names are allowed within the same album.

Artists.Name: While artist names might not be strictly unique in the real world (think common names like John Smith), having a unique constraint on Artists.Name can simplify queries and avoid confusion within your data.

Specific Formatting (CHECK):

Tracks.ReleaseDate: You can use a CHECK constraint to ensure the ReleaseDate format is valid (e.g., YYYY-MM-DD).

Tracks.TrackDuration: A CHECK constraint can enforce a minimum or maximum duration for tracks (in seconds or minutes).

Additional Constraints:

FOREIGN KEY: The foreign key constraints you already have in your schema ensure referential integrity. A track's ArtistId must reference an existing artist in the Artists table, and AlbumId must reference an existing album in the Albums table.

DEFAULT: You can set default values for optional columns like Tracks.AddedAt to the current timestamp when a new track is inserted.

3. Write code to create a database and build queries. Your task is to create a reproducible code

Database modeling : Creation & Loading of data -

APPROACH: (by Avishmita)

Data Preprocessing :

It was important to take several factors into consideration

1. To insert the data in the SQL file, there were some issues with respect to importing the data using the CSV file related to permission issues. Also the import data wizard option did not work. So we used an online SQL generator which feeds in a CSV file and gives out `INSERT INTO (....) VALUES (.....)` SQL statements.
 - a. Ref : <https://konbert.com/convert/csv/to/sql>
2. `DATE` and `DATETIME` had to be formatted for the fields **ReleaseDate** and **AddedAt**. To accomplish this we used the **str_to_date** function.
3. **ArtistGenres** and **Artist** attributes might have multiple comma separated values which have been taken care of during normalization.

CODE : (by Avishmita)

- by Avishmita

```
CREATE TEMPORARY TABLE my_table (
  TrackName VARCHAR(255),
  ArtistName VARCHAR(255),
  AlbumName VARCHAR(255),
  AlbumArtistName VARCHAR(255),
  AlbumReleaseDate VARCHAR(20),
  AlbumImageUrl VARCHAR(255),
  TrackDuration INT,
  Explicit BOOLEAN,
  AddedAt VARCHAR(30),
  ArtistGenres VARCHAR(255), -- Assuming genres are comma-separated in
  CSV
  Labels VARCHAR(255), -- Assuming labels are comma-separated in CSV
  Copyrights VARCHAR(500) -- Assuming multiple copyright info for a track
);
```

Insertion ** : More on this at the end of the page.

```
DROP TABLE my_table; -- by Avishmita
```

```
ALTER TABLE my_table -- by Avishmita
ADD ConvertedReleaseDate DATE;
```

```
UPDATE my_table -- by Avishmita
SET AlbumReleaseDate =
  CASE
    WHEN LENGTH(AlbumReleaseDate) = 4 THEN
      STR_TO_DATE(CONCAT(AlbumReleaseDate, '/01/01'), '%Y/%m/%d') -- Defaulting
      to January 1st of the given year
    ELSE STR_TO_DATE(AlbumReleaseDate, '%m/%d/%Y') -- If the value is
    in the format 'month/day/year'
```

```

END;

ALTER TABLE my_table -- by Avishmita
ADD ConvertedAddedAT DATETIME;

UPDATE my_table -- by Avishmita
SET ConvertedAddedAt = STR_TO_DATE(AddedAt, '%Y-%m-%dT%H:%i:%sZ');

SELECT * FROM my_table; -- by Avishmita

ALTER TABLE my_table -- by Avishmita
DROP COLUMN ConvertedReleaseDate,
DROP COLUMN AddedAt;

ALTER TABLE my_table -- by Avishmita
CHANGE ConvertedAddedAT AddedAt DATETIME;

-- Create Artists table -- by Avishmita
CREATE TABLE Artists (
    ArtistId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL
);

-- Insert into Artists table -- by Avishmita
INSERT INTO Artists (Name)
SELECT DISTINCT ArtistName
FROM my_table;

-- Create Albums table -- by Avishmita
CREATE TABLE Albums (
    AlbumId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL,
    ArtistId INT NOT NULL,
    ReleaseDate DATE,
    AlbumImageUrl VARCHAR(255),
    FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId)
);

-- Insert into Albums table -- by Avishmita
INSERT INTO Albums (Name, ArtistId, ReleaseDate, AlbumImageUrl)
SELECT DISTINCT AlbumName, Artists.ArtistId, AlbumReleaseDate,
AlbumImageUrl
FROM my_table
JOIN Artists ON my_table.ArtistName = Artists.Name;

SELECT * FROM Albums; -- by Avishmita

-- Create Tracks table -- by Avishmita
CREATE TABLE Tracks (

```

```

TrackId INT AUTO_INCREMENT PRIMARY KEY,
TrackName VARCHAR(255) NOT NULL,
ArtistId INT NOT NULL,
AlbumId INT NOT NULL,
ReleaseDate DATE,
AlbumImageUrl VARCHAR(255),
TrackDuration INT,
Explicit BOOLEAN,
AddedAt DATETIME,
FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId),
FOREIGN KEY (AlbumId) REFERENCES Albums(AlbumId)
);

-- Insert into Tracks table -- by Avishmita
INSERT INTO Tracks (TrackName, ArtistId, AlbumId, ReleaseDate,
AlbumImageUrl, TrackDuration, Explicit, AddedAt)
SELECT TrackName, Artists.ArtistId, Albums.AlbumId, AlbumReleaseDate,
my_table.AlbumImageUrl, TrackDuration, Explicit, AddedAt
FROM my_table
JOIN Artists ON my_table.ArtistName = Artists.Name
JOIN Albums ON my_table.AlbumName = Albums.Name;

-- Create ArtistGenres table -- by Avishmita
CREATE TABLE ArtistGenres (
ArtistId INT NOT NULL,
Genre VARCHAR(255) NOT NULL,
FOREIGN KEY (ArtistId) REFERENCES Artists(ArtistId)
);

-- Insert into ArtistGenres table -- by Avishmita
INSERT INTO ArtistGenres (ArtistId, Genre)
SELECT DISTINCT Artists.ArtistId,
SUBSTRING_INDEX(SUBSTRING_INDEX(my_table.ArtistGenres, ',', numbers.n),
',', -1) AS genre
FROM
my_table
JOIN
Artists ON my_table.ArtistName = Artists.Name
JOIN
(
SELECT
1 + units.i + tens.i * 10 AS n
FROM
(SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3
UNION SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT
8 UNION SELECT 9) AS units
CROSS JOIN

```

```

        (SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3
UNION SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT
8 UNION SELECT 9) AS tens
    ) AS numbers
WHERE
    numbers.n <= 1 + LENGTH(my_table.ArtistGenres) -
LENGTH(REPLACE(my_table.ArtistGenres, ',', ''));

SELECT * FROM ArtistGenres;

-- Create Labels table -- by Avishmita
CREATE TABLE Labels (
    LabelId INT AUTO_INCREMENT PRIMARY KEY,
    Name VARCHAR(255) NOT NULL
);

-- Insert into Labels table -- by Avishmita
INSERT INTO Labels (Name)
SELECT DISTINCT SUBSTRING_INDEX(SUBSTRING_INDEX(my_table.Labels, ',',
numbers.n), ',', -1) AS label
FROM my_table
JOIN (
    SELECT
        1 + units.i + tens.i * 10 AS n
    FROM
        (SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3 UNION
SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT 8
UNION SELECT 9) AS units
    CROSS JOIN
        (SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3 UNION
SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT 8
UNION SELECT 9) AS tens
    ) AS numbers
WHERE
    numbers.n <= 1 + LENGTH(my_table.Labels) -
LENGTH(REPLACE(my_table.Labels, ',', ''));

-- Create TrackLabels table -- by Avishmita
CREATE TABLE TrackLabels (
    TrackId INT NOT NULL,
    LabelId INT NOT NULL,
    FOREIGN KEY (TrackId) REFERENCES Tracks(TrackId),
    FOREIGN KEY (LabelId) REFERENCES Labels(LabelId)
);

-- Insert into TrackLabels table -- by Avishmita
INSERT INTO TrackLabels (TrackId, LabelId)
SELECT Tracks.TrackId, Labels.LabelId
FROM (

```

```

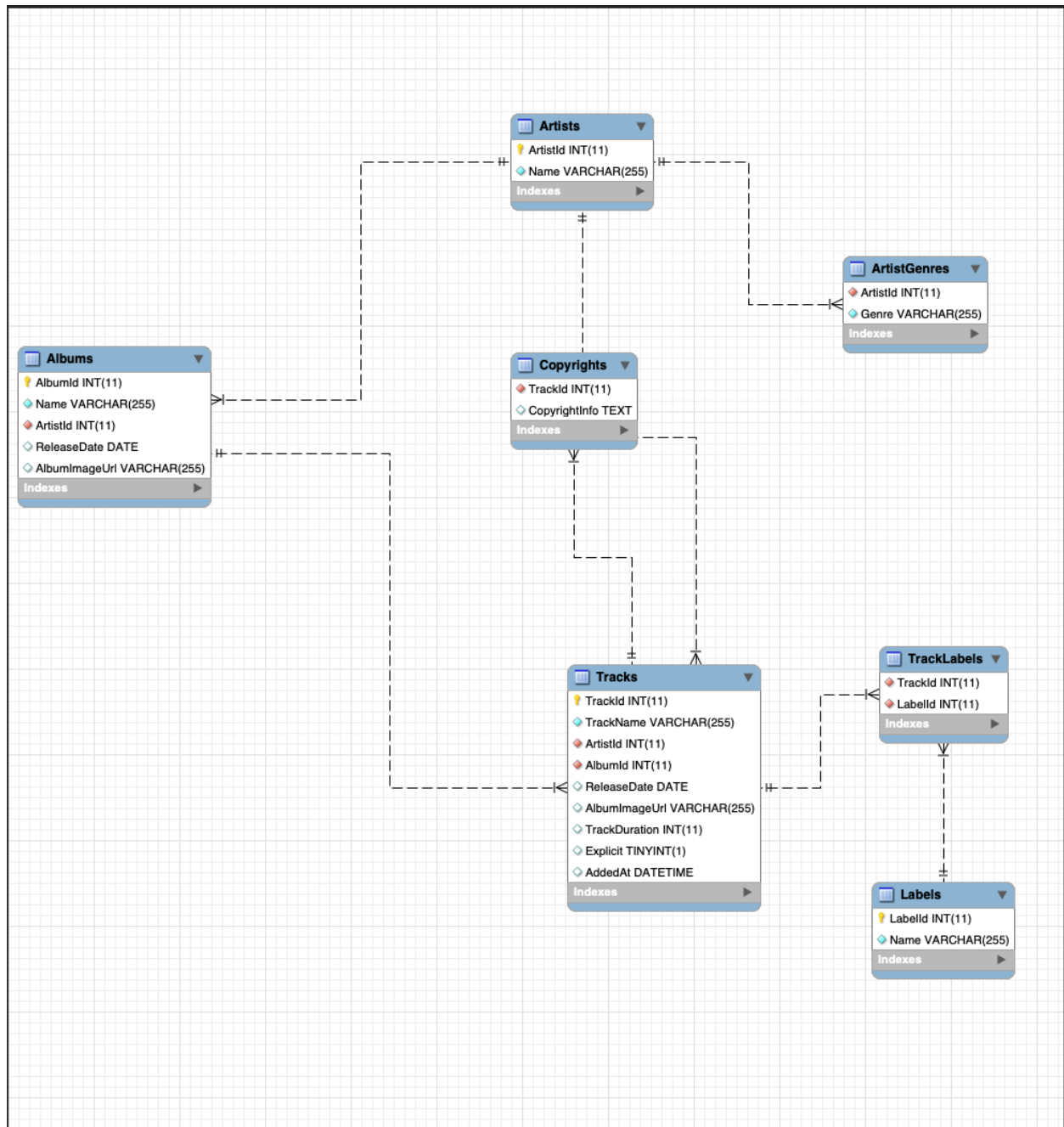
        SELECT *,
            SUBSTRING_INDEX(SUBSTRING_INDEX(Labels, ',', numbers.n), ',',
-1) AS label
        FROM my_table
        JOIN (
            SELECT
                1 + units.i + tens.i * 10 AS n
            FROM
                (SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3
                UNION SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT
                8 UNION SELECT 9) AS units
            CROSS JOIN
                (SELECT 0 AS i UNION SELECT 1 UNION SELECT 2 UNION SELECT 3
                UNION SELECT 4 UNION SELECT 5 UNION SELECT 6 UNION SELECT 7 UNION SELECT
                8 UNION SELECT 9) AS tens
            ) AS numbers
        WHERE
            numbers.n <= 1 + LENGTH(Labels) - LENGTH(REPLACE(Labels, ',',
            ''))
    ) AS my_table_normalized
JOIN Tracks ON my_table_normalized.TrackName = Tracks.TrackName
JOIN Labels ON my_table_normalized.label = Labels.Name;

-- Create Copyrights table -- by Avishmita
CREATE TABLE Copyrights (
    TrackId INT NOT NULL,
    CopyrightInfo TEXT,
    FOREIGN KEY (TrackId) REFERENCES Tracks(TrackId)
);

-- Insert into Copyrights table -- by Avishmita
INSERT INTO Copyrights (TrackId, CopyrightInfo)
SELECT Tracks.TrackId, Copyrights
FROM my_table
JOIN Tracks ON my_table.TrackName = Tracks.TrackName;

```


ER Diagram After Data Modelling (via Reverse Engineering Tool) - by Avishmita



Creation of Database and Queries - Netra Venkatapathy

```
CREATE DATABASE Final_Project_Part_2;
```

```
-- Imported final.csv using containing 200 rows
```

```
SELECT * FROM final;
```

Track Name	Artist Name(s)	Album Name	Album Artist Name(s)	Album Release Date	Album Image URL	Track Duration (m)	Explicit	Added At	Artist Genres
Justified & Ancient - Stand by the Jams	The KLF	Songs Collection	The KLF	8/2/1992	https://i.scdn.co/image/ab67616d0000b273553...	2:16:270	FALSE	2020-03-05T09:20:39Z	acid house,ambient house
I Know You Want Me (Calle Ocho)	Pitbull	Pitbull Starring In Rebelution	Pitbull	10/23/2009	https://i.scdn.co/image/ab67616d0000b27326d...	2:37:120	FALSE	2021-08-08T09:26:31Z	dance pop,miami hip hop,t
From the Bottom of My Broken Heart	Britney Spears	...Baby One More Time (Digital Deluxe Version)	Britney Spears	1/12/1999	https://i.scdn.co/image/ab67616d0000b2738e4...	3:12:533	FALSE	2021-08-08T09:26:31Z	dance pop,pop
Apeman - 2014 Remastered Version	The Kinks	Lola vs. Powerman and the Moneyground, Pt. ...	The Kinks	10/20/2014	https://i.scdn.co/image/ab67616d0000b2731e7...	2:33:400	FALSE	2021-08-08T09:26:31Z	album rock,art rock,british
You Can't Always Get What You Want	The Rolling Stones	Let It Bleed	The Rolling Stones	12/5/1969	https://i.scdn.co/image/ab67616d0000b27373d...	4:48:720	FALSE	2021-08-08T09:26:31Z	album rock,british invasion
Don't Stop - 2004 Remaster	Fleetwood Mac	Rumours	Fleetwood Mac	2/4/1977	https://i.scdn.co/image/ab67616d0000b27375d...	1:53:346	FALSE	2022-08-31T00:08:18Z	album rock,classic rock,ro
Eastside (with Halsey & Khalid)	benny blanco, Halsey, Khalid	Eastside (with Halsey & Khalid)	benny blanco, Halsey, Khalid	7/12/2018	https://i.scdn.co/image/ab67616d0000b273315...	1:73:799	FALSE	2021-08-08T09:26:31Z	pop,electropop,etherpop
Something About The Way You Look Tonight - E...	Elton John	Candle In The Wind 1997 / Something About ...	Elton John	1/1/1997	https://i.scdn.co/image/ab67616d0000b27352a...	2:40:546	FALSE	2021-08-08T09:26:31Z	glam rock,mellow gold,pia
Juke Box Hero	Foreigner	4 (Expanded)	Foreigner	1981	https://i.scdn.co/image/ab67616d0000b27362d...	2:59:800	FALSE	2021-08-08T09:26:31Z	album rock,classic rock,gl

```
-- Display Tracks by artist - Netra V
```

```
SELECT `Track Name`, `Artist Name(s)`, `Album Name`, `Artist
Genres`
FROM final
WHERE `Artist Name(s)` LIKE '%Elton John%';
```

Track Name	Artist Name(s)	Album Name	Artist Genres
Something About The Way You Look Tonight - E...	Elton John	Candle In The Wind 1997 / Something About ...	glam rock,mellow gold,piano rock,rock
Philadelphia Freedom	Elton John	Captain Fantastic (Deluxe Edition)	glam rock,mellow gold,piano rock,rock

```
-- Display Tracks by Genre (Top 10) - Netra V
```

```
SELECT `Track Name`, `Artist Name(s)`, `Album Name`, `Artist
Genres`
FROM final
WHERE `Artist Genres` LIKE '%pop%'
LIMIT 10;
```

Track Name	Artist Name(s)	Album Name	Artist Genres
I Know You Want Me (Calle Ocho)	Pitbull	Pitbull Starring In Rebelution	dance pop,miami hip hop,pop
From the Bottom of My Broken Heart	Britney Spears	...Baby One More Time (Digital Deluxe Version)	dance pop,pop
Eastside (with Halsey & Khalid)	benny blanco, Halsey, Khalid	Eastside (with Halsey & Khalid)	pop,electropop,etherpop,indie poptimism,pop,p...
Mercy	Shawn Mendes	Illuminate (Deluxe)	canadian pop,pop,viral pop
Listen to the Band - Single Version	The Monkees	The Best of The Monkees	album rock,beatlesque,bubblegum pop,classic r...
Sing	Ed Sheeran	x (Deluxe Edition)	pop,singer-songwriter pop,uk pop
Mississippi	Pussycat	First Of All	nederpop
Flava	Nathaniel	Yours	australian pop,australian talent show
Landslide (Glee Cast Version) (feat. Gwyneth P...	Glee Cast, Gwyneth Paltrow	Landslide (Glee Cast Version) (feat. Gwyneth P...	glee club,post-teen pop
I'm Free	The Soup Dragons, Junior Reid	20 Golden Greats	britpop,c86,madchester,scottish indie,lovers ro...





```
-- Display Tracks by label (Top 5) - Netra V
```

```
SELECT `Track Name`, `Artist Name(s)`, `Album Name`, `Artist
Genres`, Label
FROM final
WHERE Label LIKE '%Universal Music Group%'
LIMIT 5;
```

Track Name	Artist Name(s)	Album Name	Artist Genres	Label
▶ You Can't Always Get What You Want	The Rolling Stones	Let It Bleed	album rock,british invasion,classic rock,rock	Universal Music Group
Mercy	Shawn Mendes	Illuminate (Deluxe)	canadian pop,pop,viral pop	Universal Music Group
I'm Free	The Soup Dragons, Junior Reid	20 Golden Greats	britpop,c86,madchester,scottish indie,lovers ro...	Universal Music Group
Dangerous Woman	Ariana Grande	Dangerous Woman	pop	Universal Music Group
Paper In Fire	John Mellencamp	The Lonesome Jubilee (Remastered)	album rock,classic rock,country rock,folk rock,h...	Universal Music Group

-- Display Track by Name - Netra V

```
SELECT `Track Name`, `Artist Name(s)`, `Album Name`, `Artist
Genres`
FROM final
WHERE `Track Name` LIKE '%Mercy%'
LIMIT 5;
```

Result Grid			Filter Rows: <input type="text"/>	Export: 	Wrap Cell Content: 
	Track Name	Artist Name(s)	Album Name	Artist Genres	
▶	Mercy	Shawn Mendes	Illuminate (Deluxe)	canadian pop,pop,viral pop	

-- Show tracks with with duration over 100000(ms) (Top 5) - Netra V

```
SELECT `Track Name`, `Artist Name(s)`, `Album Name`, `Track
Duration (ms)`
FROM final
WHERE `Track Duration (ms)` >= 100000
LIMIT 5;
```

	Track Name	Artist Name(s)	Album Name	Track Duration (ms)
▶	Justified & Ancient - Stand by the Jams	The KLF	Songs Collection	216270
	I Know You Want Me (Calle Ocho)	Pitbull	Pitbull Starring In Rebelution	237120
	From the Bottom of My Broken Heart	Britney Spears	...Baby One More Time (Digital Deluxe Version)	312533
	Apeman - 2014 Remastered Version	The Kinks	Lola vs. Powerman and the Moneygoround, Pt. ...	233400
	You Can't Always Get What You Want	The Rolling Stones	Let It Bleed	448720