

# Create Your Music Database

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You will design and create a music database. The database will contain the following domain objects (concepts):

- artist
- album
- track
- song
- song writer

## Design the Schema (Screenless Activity)

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Use pencil/pen and paper or a whiteboard for this activity. Draw database diagrams: tables with lines between them to represent one-to-many relationships.

- Make a list of the tables that you obviously need identify relationships between each pair of tables, are they one-to-many or many-to-many relationships? If it's many-to-many, you need to add a junction table in between - give the junction table a meaningful name.
- List the columns you would want to have for each table in the list above. Read ahead to the "Questions" section below to make sure you have the columns you need to answer those questions.

## Author the Schema

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Write your schema in a `.sql` file, say `music.db.sql` . Load in that schema by doing `psql music_db -f music.db.sql` .

## Entering Data

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You will now painstakingly enter data into this database. Enter data for your favorite music. Enter enough data so that the answers to the questions below will be interesting. You should have at least three artists, six albums, and thirty tracks.

## Questions

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You will answer the following questions by writing SQL queries:

1. What are tracks for a given album?
2. What are the albums produced by a given artist?
3. What is the track with the longest duration?
4. What are the albums released in the 60s? 70s? 80s? 90s?
5. How many albums did a given artist produce in the 90s?
6. What is each artist's latest album?
7. List all albums along with its total duration based on summing the duration of its tracks.
8. What is the album with the longest duration?
9. Who are the 5 most prolific artists based on the number of albums they have recorded?
10. What are all the tracks a given artist has recorded?
11. What are the top 5 most often recorded songs?
12. Who are the top 5 song writers whose songs have been most often recorded?
13. Who is the most prolific song writer based on the number of songs he has written?
14. What songs has a given artist recorded?
15. Who are the song writers whose songs a given artist has recorded?
16. Who are the artists who have recorded a given song writer's songs?

## Challenges

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### Challenge one

Allow an album to have multiple artists:

- a lead artist
- any number of collaborators

Write SQL queries to answer the following:

- **1 Star:** Update your schema to support this without modifying any existing data.
- **2 Star:** Given a lead artist, what collaborators has he worked with? Hint: you can give the same table 2 different aliases. For example, a query to find all people you follow would look like `select from "user" as follower, "user" as followee where ...`
- **3 Star:** Given an artist who has worked as a collaborator, who are the other collaborators he has worked with?

## Challenge Two

Support the ability to search for tracks by instrument.

Write SQL queries to find the following:

1. Get the list of tracks with a violin in it. (You can sub in your instrument of choice)
2. Get the list of tracks with both a harmonica and an accordion. (Again, sub in your instruments of choice)
3. Get the list of vocal tracks.
4. Get the list of instrumental tracks (no vocal).
5. Get a list of piano solo tracks (piano and no other instrument).