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Database Design: SyncSounds

In this design, there are many resulting relations that can be identified after converting the ER model to relations. They are listed here:

- Artist (Artist_ID, Artist_Name)
- Album (Album_ID, Artist_ID, Album_type, Album_Name)
- Track (Track_ID, Track, Duration_ms, Album_ID)
- Musicality (Musicality_ID, Track_ID, Tempo, Musicality_Key)
- Energy (Energy_ID, Track_ID, Danceability, Energy)
- Spoken_Volume (Spoken_Volume_ID, Track_ID, Loudness, Instrumentalness, Speechiness, Acousticness)
- Human_Connection (Human_Connection_ID, Track_ID, Liveness, Valence)
- YouTube_Video (YouTube_ID, Title, Channel, Licensed, Official_Video, Youtube_Video_ID)
- Performance (Performance_ID, YouTube_Video_ID, Likes, Comments)
- Spotify_YouTube (YouTube_ID, Track_ID, Views, Streams)

Next, we will look into the functional dependencies that have been identified as a part of this relational process:

- Artist

- Artist_ID -> Artist_Name
- Album
 - Album_ID -> Artist_ID, Album_type, Album_Name
 - Artist_ID -> Artist_Name
- Track
 - Track_ID -> Track, Duration_ms, Album_ID
- Musicality
 - Musicality_ID -> Track_ID, Tempo, Musicality_Key
- Energy
 - Energy_ID -> Track_ID, Danceability, Energy
- Spoken_Volume
 - Spoken_Volume_ID -> Track_ID, Loudness, Instrumentalness, Speechiness, Acousticness
- Human_Connection
 - Human_Connection_ID -> Track_ID, Liveness, Valence
- YouTube_Video
 - YouTube_ID -> Title, Channel, Licensed, Official_Video, Youtube_Video_ID
- Performance
 - Performance_ID -> YouTube_Video_ID, Likes, Comments
- Spotify_YouTube
 - YouTube_ID, Track_ID -> Views, Streams

As far as the normalization steps go, we found that no further normalization is needed since the relations are already in 3NF. The relations are normalized and free from update anomalies:

1. 1NF: All relations are already in 1NF since each attribute contains atomic values
2. 2NF: No partial dependencies exist. All non-prime attributes are fully functionally dependent on the primary keys
3. 3NF: No transitive dependencies exist. All non-prime attributes are non-transitively dependent on the primary keys

Based on the relations, dependencies, and normalization explained above, here is our final ER Model for this project:

