

# Checkpoint 1

## Team 10



Definitely Not *Spotify*

### Members

**Jacob Refugio Rangel**  
**Shruthi Yenamagandla**  
**Diego Vera Garza**  
**Emma U. Pham**  
**Abdul Rafay Khan**

## **SCOPE OF THE MINI-WORLD**

## Accounts

In the Online Music Library, there are two primary roles: **USERS** and **ARTISTS**, which are derived from the **USER entity**. Each user is required to create an account with personal information including their name, date of birth, email, and phone number, alongside a secure password. Listeners can search for music, manage playlists, and interact with songs through various operations such as play, pause, skip, and like. While still regarded as **USERS**, **ARTISTS** can upload and manage their music and albums directly on their account page. This **entity** serves as the core of the Online Music Library, enabling the interaction between **USERS** and **ARTISTS**.

## Login Details

- The user/artist needs some type of login, whether a new or existing to log in.
  - **New User/Artist:** If the user/artist is new to the platform, they will be prompted to create an account, adhering to the following requirements:
  - **Requirements:**
    - **First Name:** The first name is constrained to 30 characters.
    - **Last Name:** The last name is constrained to 30 characters.
    - **Date of Birth:** The date of birth is constrained to the format MM-DD-YYYY.
    - **Email:** A unique email address for the account, containing the "@" symbol.
    - **Phone Number:** The phone number is formatted as (NNN) - NNN - NNNN.
    - **Password:** A password with a minimum of 5 characters, including at least 1 special character, 1 uppercase letter, and 1 or more numbers.
    - **Confirm Password:** Verification of the password to ensure accuracy.
  - **Optional:**
    - **Biography:** Users/Artists have the option to create a biography to share more about themselves.
    - **Profile Image:** Users/Artists can upload an image for their account profile.
  - **Plans/Subscriptions:** Once the account is created, users/artists are prompted with various subscription plans tailored to their needs:
    - **Free:** Offers listening to music, with limited skips and only 5 playlist creations
    - **Personal:** Offers creation of unlimited playlists, and unlimited skips for \$10.99.
    - **Family:** Provides unlimited skips and playlists that can be shared with up to 5 people for \$16.99.

- **Student:** Discounted plan with unlimited skips and playlists for \$5.99.
- **Existing User/Artist:** If the user/artist already has an account, they will be prompted to sign in using their credentials:
  - **Email or Phone Number:** Users/Artists can sign in using their registered email address or phone number.
  - **Password:** Password associated with the account.
- If the user/artist forgets their account password, they will be prompted to use one of these credentials as a recovery option for a new password:
  - **Email:** A recovery link is sent to the registered email address.
  - **Phone Number:** A recovery link is sent to the registered phone number.

## USER, ARTIST & ADMIN

- Functions:
  - **Edit Account Info:** Modify personal information such as first name, last name, and account picture.
  - **Biography:** Provide additional information about themselves through a biography.
  - **View Settings:** Access and customize account settings such as email, password, date of birth, and theme preferences (Light Mode/Dark Mode).
  - **Log out:** Sign out of the user's account to ensure privacy and security.

## ARTIST

- Artist Functions: Artists are still accounted as users but they have additional features unique to their account.
  - **Upload Music:** Artists can upload their music content to their accounts.
    - **Singles:** Individual tracks released as standalone songs.
    - **MP4:** Music videos accompanying singles or albums.
    - **Cover Art:** Artwork or visuals representing singles or albums.
    - **Albums/EPs:** Collections of multiple tracks released as albums or extended plays.
  - **Modify Existing Music:** Artists can modify their existing music content on their accounts, including:
  - **Delete:** Remove singles or albums from their catalog, ensuring control over their content and releases.

**SCOPE OF THE MINI-WORLD:**  
**ENTITIES IN THE MINI WORLD**

## **SUBSCRIPTION Entity**

This **SUBSCRIPTION entity** outlines the different plans available to users. It categorizes subscription plans into Free, Personal, Family, and Student plans, each offering various levels of access such as the creation of unlimited playlists, unlimited skips, and account-sharing options. This **SUBSCRIPTION entity** is important for managing user access rights and personalizing the listening experience. Attributes include subscriptionID, subscriptionType, subscriptionStatus, cost, and start/end/renew dates.

### **Subscription Features**

- This **entity** directly impacts the user experience by offering various subscription plans tailored to meet their needs
  - **Subscription ID:** A unique identifier for each subscription instance, facilitating easy management and reference.
  - **User ID:** Links the subscription to a specific user account, ensuring personalized access and plan management.
  - **Card ID:** The user's card credentials.
  - **Plan Type:** Specifies the type of subscription plan (e.g., Free, Personal, Student), each with its own set of features and benefits.
  - **Price:** The cost associated with the subscription plan
  - **Duration:** The validity period of the subscription
  - **Start Date:** The date when the subscription becomes active, marking the beginning of the billing cycle or access period.
  - **End Date:** The date when the subscription is set to expire or renew, providing users with information for renewal decisions.
  - **Features:** A detailed list of features and services available under the subscription, such as unlimited skips, and unlimited playlist creations.
  - **Status:** Indicates the current status of the subscription (e.g., Active, Pending, Canceled), offering insights into the user's subscription lifecycle.
- Subscription Operations
  - **Create/Update:** Allows users to sign up for a new subscription or modify an existing one, tailoring their experience to their current preferences.
  - **Renew:** Automatic or manual renewal processes ensure uninterrupted access to subscription benefits.
  - **Cancel:** Provides users with the option to cancel their subscription, with the platform potentially offering alternatives or incentives to retain the user.
  - **Payment Management:** Integration with transaction entity for subscription fees, including handling of billing details and transaction history.

## SONG Entity

The **SONG entity** represents individual music tracks available within the Online Music Library application. It contains detailed information about each song, including title, artist, album, duration, and file details for streaming. This **SONG entity** is crucial to the application's core functionality of music streaming, allowing users to search, play, and add songs to playlists or their library. Attributes include song ID, title, artist name, album name, duration, and file path.

## Song Features

- Song Capabilities
  - **Title:** The name of the song serves as the primary identifier for users to search and identify tracks.
  - **Artist:** The name of the individual or group who created the song, linking it to their profile
  - **Album:** The collection or album to which the song belongs, providing context for the song
  - **Duration:** The length of the song in minutes and seconds
  - **Genre:** The musical genre or genres the song falls into, aiding in categorization and personalized recommendations.
  - **Cover Art:** A visual representation associated with the song or its album, enhancing aesthetic appeal and recognition.
  - **Rating:** User-generated ratings or system-calculated popularity scores, guiding users toward high-quality or popular tracks.
- Song Operations:
  - **Play:** Initiates the playback of the song, allowing users to listen to the track.
  - **Pause:** Temporarily stops song playback, enabling users to resume listening at their convenience.
  - **Replay:** Restarts the song from the beginning, offering the option to listen to a track repeatedly.
  - **Mute/Unmute:** Controls the audio output, allowing users to mute the song temporarily without stopping playback.
  - **Add to various playlists:** Enables users to include the song in one or more of their playlists.
  - **Like:** Allows users to express their preference for a song, influencing recommendations.
  - **Go to Artist:** Directs users to the artist's profile or page, where they can explore more songs, albums, and information about the artist.
  - **Go to Album:** Navigate to the album's page containing the song, allowing users to explore the complete work and other tracks within the same album.

## **PLAYLIST Entity**

The **PLAYLIST entity** allows users to curate collections of songs based on their preferences. It provides functionalities for creating, editing, and managing playlists, including adding or deleting songs, rearranging their order, and customizing playlist details like cover art, title, and description. This **PLAYLIST entity** enhances user engagement by allowing personalized music experiences. Its attributes include playlist ID, user ID (owner), playlist name, description, and number of songs.

### **Playlist Features**

- Playlist Attributes
  - **Playlist ID:** A unique identifier for each playlist, facilitating easy access and management.
  - **User ID:** The identifier linking the playlist to its creator, ensuring personalization
  - **Playlist Title:** The name given to the playlist by the user
  - **Description:** A brief explanation or summary of the playlist's content or purpose
  - **Cover Art:** An image or graphic selected by the user to visually represent the playlist
  - **Songs:** A collection of song entities that are part of the playlist, each with attributes like title, artist, and duration.
- Playlists can be managed with these features:
  - **Search For Song In the Playlist:** Allows users to find songs within a specific playlist using criteria such as Song Title, Album Title, or Artist Name, making navigation and editing more efficient.
  - **Edit Playlist Details:** Users can modify the playlist's title, description, and cover art
- Playlists should be able to do these operations with songs:
  - **Add Songs:** Users can include additional songs to the playlist, expanding its content and diversity.
  - **Delete Songs:** Provides the option to remove songs from the playlist.
  - **Move Songs Order (Custom):** Enables users to manually adjust the order of songs within the playlist, tailoring the listening experience to their preference.
  - **Sort Operations:** Offers automated sorting of songs within the playlist based on criteria like Song Title, Album Title, Artist Name, Date Added, or Duration, facilitating organization



## **PLAYLISTSONG Entity**

The **PLAYLIST** entity is an essential aspect of the Online Music Library, acting as the bridge that connects individual songs to user-curated playlists. This entity facilitates the dynamic inclusion and organization of songs within playlists, allowing users to personalize their listening experience to an unprecedented degree. The **PLAYLIST** entity embodies the relationship between songs and playlists through detailed attributes and specialized operations.

### **PlaylistSong Features**

- PlaylistSong Attributes
  - **PlaylistSong ID:** A unique identifier for each instance of a song within a playlist, ensuring precise management and retrieval.
  - **Playlist ID:** Links the song to a specific playlist, denoting which collection the song belongs to.
  - **Song ID:** Identifies the song being added to the playlist, connecting it to the broader music library.
  - **Date Added:** Indicates the date when the song was added to the playlist, allowing users to track the chronological order of song additions.
- PlaylistSong Operations
  - **Add Song to Playlist:** Facilitates the addition of a new song to a playlist, enabling users to continuously update and expand their music collections.
  - **Remove Song from Playlist:** Allows for the removal of a song from a playlist.
  - **Reorder Songs:** Users can change the order of songs within a playlist.
  - **Sort Operations:** Automated sorting features based on criteria such as Date Added, Song Title, Album Title, Artist Name, or Duration.

## **PAYOUT Entity**

The **PAYOUT** entity is designed for financial transactions directed towards artists. Monthly payouts based on streaming revenues to the artist are considered under this entity. It includes details such as Artist ID, payout amount, and date, to pay artists for their contributions to the platform.

### **Payout Features**

- Payout Attributes:
  - **Artist ID:** This is the unique identification of the user for the payout is intended towards.
  - **Payout Amount:** The amount of money paid to the artist depending on the artist's ID.
  - **Date:** The date of the transaction.

## **TRANSACTIONS Entity**

The **TRANSACTIONS entity** handles the financial transactions from users and artists. It collects payment information such as transactionID, subscriptionID, cardID, amount, payment method, transaction date, and transaction notes. This **TRANSACTIONS entity** is essential for the financial management of the Online Music Library Mini World, creating smooth transactions for both users and artists.

### **Transactions Features**

- Transactions Attributes:
  - **TransactionID:** This is a unique ID that corresponds to each transaction made.
  - **Transaction Date:** The date that the transaction was made.
  - **Transaction Notes:** Optional notes the user can enter regarding their transaction.
  - **Payment Method:** The method chosen by the user to create a transaction.
  - **Amount:** The amount that the transaction performs.
- Transactions Operations:
  - **Change Payment Method:** Update the payment method associated with the account.
  - **View Order History:** Access a history of past subscription orders, including dates, plans, and costs.

## **GENRE Entity**

The **GENRE entity** is a fundamental component of the Online Music Library, serving as a key categorization tool that organizes the vast array of musical content available on the platform. This **GENRE entity** allows for the classification of songs, albums, and artists into distinct musical genres, facilitating easier discovery and navigation for users. By grouping music by genre, the library enhances user experience through tailored recommendations, genre-specific playlists, and intuitive search functionality.

### **Genre Features**

- Genre Attributes:
  - **GenreID:** Unique identifier for each music genre.
  - **Genre Name:** The name of the genre.

## **ALBUM Entity**

The **ALBUM entity** is a vital element of the Online Music Library, serving as a structured collection of songs released by artists. This **entity** enables users to explore and engage with cohesive bodies of work, offering insights into an artist's creative vision and musical expression.

### **Album Features**

- Album Attributes:
  - **AlbumID:** Unique identifier for each album.
  - **ArtistID:** Links to the artist who released the album.
  - **Album Name:** Name of the corresponding album.
  - **Album Cover:** Image representing the album.
  - **GenreID:** Unique identifier for each genre.
  - **Number of Likes:** The number of likes each album receives.
  - **Duration:** The duration of a song in minutes.
  - **Release date:** The date the album was released.

## **SONGLIKED Entity**

The **SONGLIKED entity** plays a significant role in capturing user preferences and interactions within the Online Music Library, specifically focusing on users expressing their appreciation for individual songs. This **entity** facilitates the tracking of liked songs, enabling personalized recommendations and enhancing user engagement.

### **SongLiked Features**

- SongLiked Attributes:
  - **SongLikedID:** A unique identifier for each instance of a user liking a song, ensuring that all like songs are being recorded for each user.
  - **UserID:** Unique identifier for each user.
  - **SongID:** Unique identifier for each song.
  - **Date Liked:** The date of the song liked.
- Functionalities:
  - **Like Song:** Allows users to express their appreciation for a specific song, indicating their preference and interest in the music.
  - **Personalized Recommendations:** Utilizes liked song data to generate personalized recommendations, suggesting similar songs or playlists that align with the user's music preferences.
  - **Enhanced User Experience:** Contributes to a more tailored and enjoyable user experience by providing users with music content that resonates with their tastes and preferences.

## USERTOGENRE Entity

The **USERTOGENRE entity** plays a crucial role in the Online Music Library by establishing a connection between users and their preferred music genres. This **entity** enables the platform to understand user preferences better, facilitating personalized recommendations, curated playlists, and tailored content delivery.

### UserToGenre Features

- UserToGenre Attributes:
  - **UserToGenreID:** Unique identifier for user to genre (the song that the user will get genre recommendations from).
  - **UserID:** Unique identifier for each user.
  - **GenreID:** Unique identifier for each genre.
  - **CreatedAt:** The date this recommendation was created.
- Operations:
  - **Get Song Recommendations:** Returns 10 songs with the most likes in that specific genre that are not in any of the specific user's playlists.
  - **Get Playlist Recommendations:** Returns a playlist of that genre with the highest rating that is not a playlist of the user.

## RATING Entity

The **RATING entity** represents the user's rating of a specific song in the music database. Each rating is uniquely identified by a ratingID and is associated with a specific user (userID) and song (songID). The rating is recorded as an integer value, allowing users to express their opinion or preference for a song. Its attributes include ratingID, userID, songID, rating, rateTimestamp, and notes.

### RATING Features

- Rating Attributes:
  - **RatingID:** Unique identifier for each rating a user provides.
  - **UserID:** Unique identifier for each user.
  - **SongID:** Unique identifier for each song.
  - **Rating:** The personal rating each user provides for a song.
  - **RateTimestamp:** The time when the song was rated.
  - **Notes:** Optional notes/reviews the user leaves for each rating.
- Operations:
  - **Add Rating:** Users should be able to rate a song out of five stars.
  - **Calculate Average Rating:** The average rating of an album that will be calculated by taking the total ratings of each song in a specific album then dividing that by the number of songs. This rating will also be out of five stars.

## **CARD Entity**

The **CARD entity** plays an essential role in storing a user's card information within the music database system. It serves as the repository for managing and organizing card-related data associated with users.

### **Card Features**

- Card Attributes:
  - **CardID:** Unique identifier for each user's card.
  - **UserID:** Unique identifier for each user.
  - **Card Type:** User's type of card (i.e.: Master Card, VISA, etc.)
  - **Card Number:** User's card number.
  - **Card Expiration:** User's card's expiration date.
  - **Card Security Number:** User's security code for the cards they use for transactions.
- Operations:
  - **Add Card:** Adds a new card to the music database for the user.
  - **Update Card:** Updates/modifies card information.
  - **Delete Card:** Removes the card from the database.
  - **Retrieve Card Information:** Retrieves details of a specific card based on the CardID and UserID.
  - **Verify Card:** Verify the validity and authenticity of a specific card for transactions.

# **ENTITIES AND THEIR PROPERTIES**

# User

- UserID: INT (7)
- UserPassword: VARCHAR (50)
- Email: VARCHAR (60)
- FirstName: VARCHAR (30)
- LastName: VARCHAR (30)
- DateOfBirth: DATE (MM-DD-YYYY)
- ProfileImage: BLOB
- Bio: VARCHAR (300)
- ArtistVerified: BOOLEAN
- AdminCertified: BOOLEAN

# Artist

- ArtistID: INT (7)
- ArtistName: VARCHAR (30)
- UserID: INT (5)

# Admin

- AdminID: INT (7)
- UserID: INT (7)

## Song

- SongID: INT (9)
- ArtistID: INT (7)
- AlbumID: INT (7)
- SongName: VARCHAR (30)
- GenreID: INT (2)
- NumberOfLikes: INT (7)
- Duration: TIME (MM:SS)

## SongLiked

- SongLikedID: INT (9)
- UserID: INT (7)
- SongID: INT (9)
- DateLiked: DATE (MM-DD-YYYY)

## Rating

- RatingID: INT (63)
- UserID: INT (7)
- SongID: INT (9)
- Rating: INT (1) (number 1-5)
- RateTimestamp TIMESTAMP
- Notes VARCHAR (100)



# Album

- AlbumID: INT ((7)
- ArtistID: INT (7)
- albumName: VARCHAR (30)
- AlbumCover: BLOB
- GenreID: (2)
- NumberOfLikes: INT (7)
- Duration: TIME (MM:SS)
- ReleaseDate: DATE (MM-DD-YYYY)

# Playlist

- PlaylistID: INT (7)
- UserID: INT (7)
- PlaylistName: VARCHAR (30)
- Description: TEXT (200)
- NumberOfSongs: INT (5)

# PlaylistSong

- PlaylistID: INT (7)
- SongID: INT (9)
- dateAdded: DATE (MM-DD-YYYY)

# Genre

- GenreID: INT (2)
- GenreName: ENUM (top 25 genres)

## UserToGenre

- UserToGenreID: INT (14)
- GenreID: INT (2)
- UserID: INT (7)
- CreatedAt: DATE (MM-DD-YYYY)

## Card

- CardID: INT (8)
- UserID: INT (7)
- CardType: ENUM ('Visa', 'Mastercard', 'American Express', 'Discover')
- CardNumber: INT (19)
- CardExp: DATE (MM-YY)
- CardSec: INT (3)

## Payout

- PayoutID: INT (8)
- ArtistID: INT (7)
- Amount: INT (10)
- payoutDATE: DATE (MM-DD-YYYY)

## Transaction

- TransactionID: INT (10)
- SubscriptionID: INT (7)
- CardID: INT (8)
- Amount: INT (5)
- PaymentMethod: VARCHAR
- TransactionDate: DATE (MM-DD-YYYY)
- TransactionNotes: VARCHAR (100)

# Subscription

- SubscriptionID: INT (7)
- UserID: INT (7)
- SubscriptionType: ENUM ('Free', 'Paid', 'Student')
- SubscriptionStatus: BOOL (active, inactive)
- StartDate: DATE (MM-DD-YYYY)
- EndDate: DATE (MM-DD-YYYY)
- RenewDate: DATE (MM-DD-YYYY)