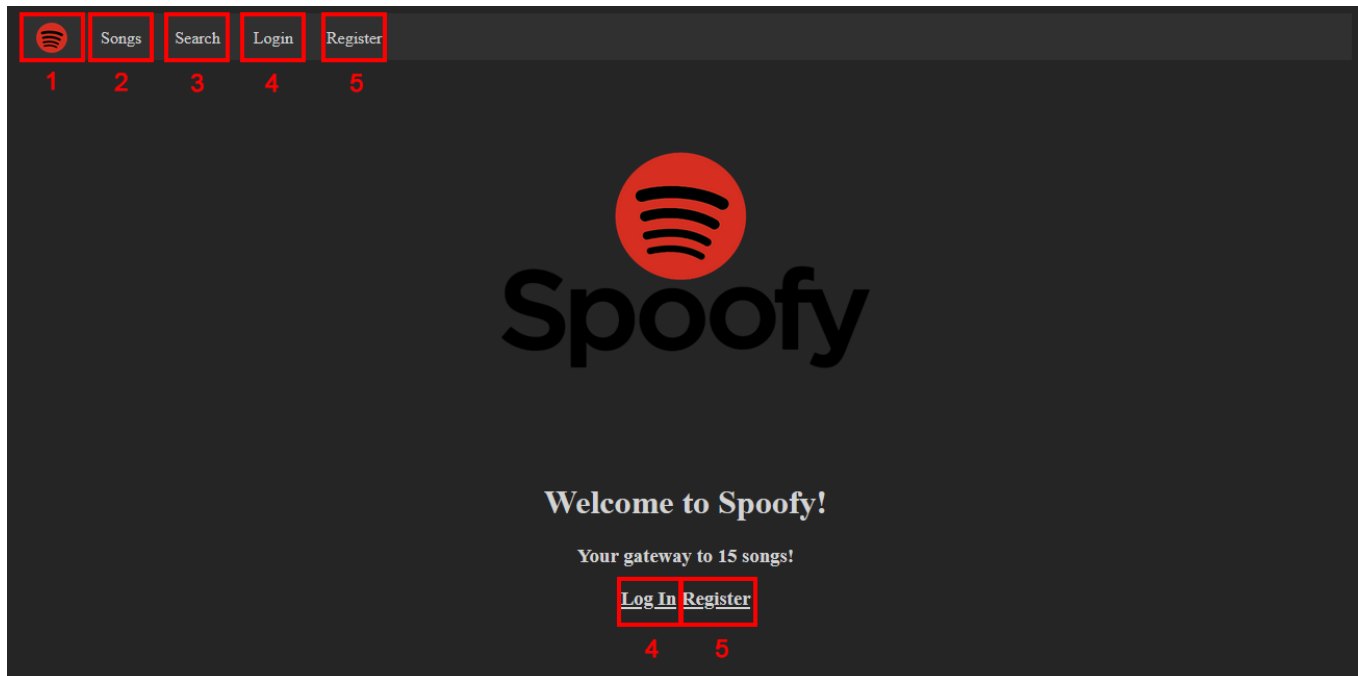# Spoofy: User Manual

Alex Stevenson - 30073617, Eric Gantz - 30031518, Ryan Fowler - 30061742
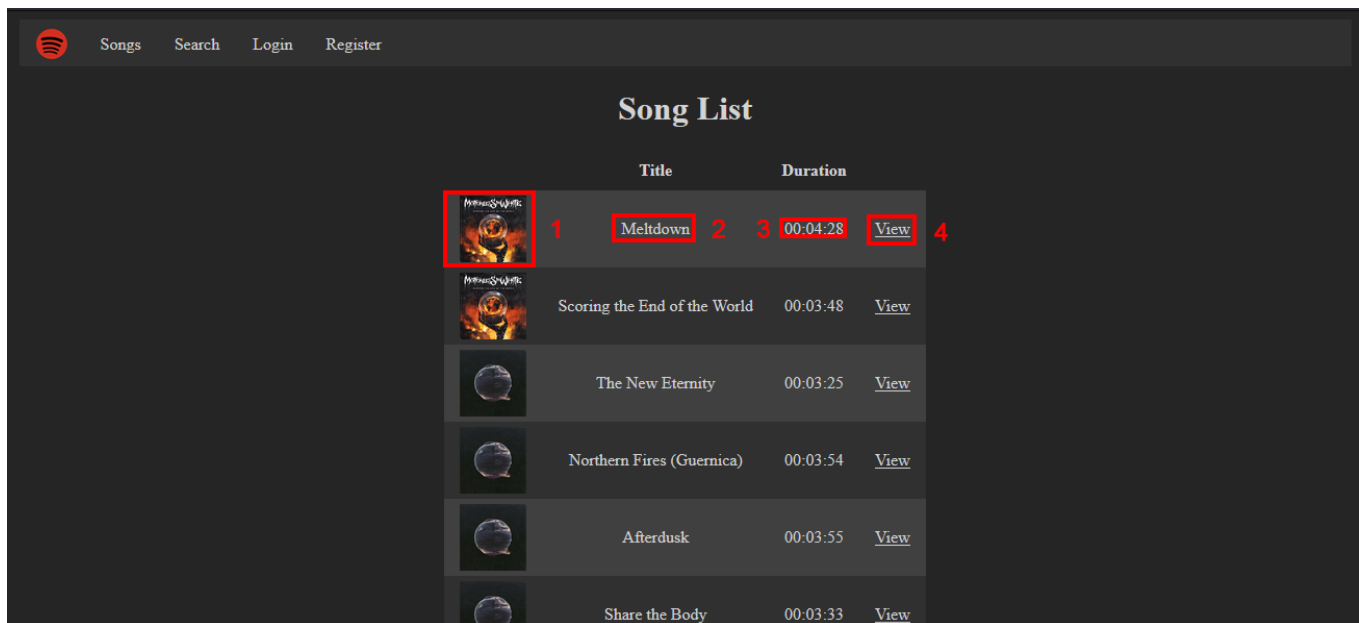
Unregistered User

Home Page

This is the main page that a user will see when accessing Spoofy for the first time. As an unregistered user, you are prompted to log in or register while also being able to access the list of songs and search functionalities.

1. Navigate to Home.
2. Navigate to Songs.
3. Navigate to Search.
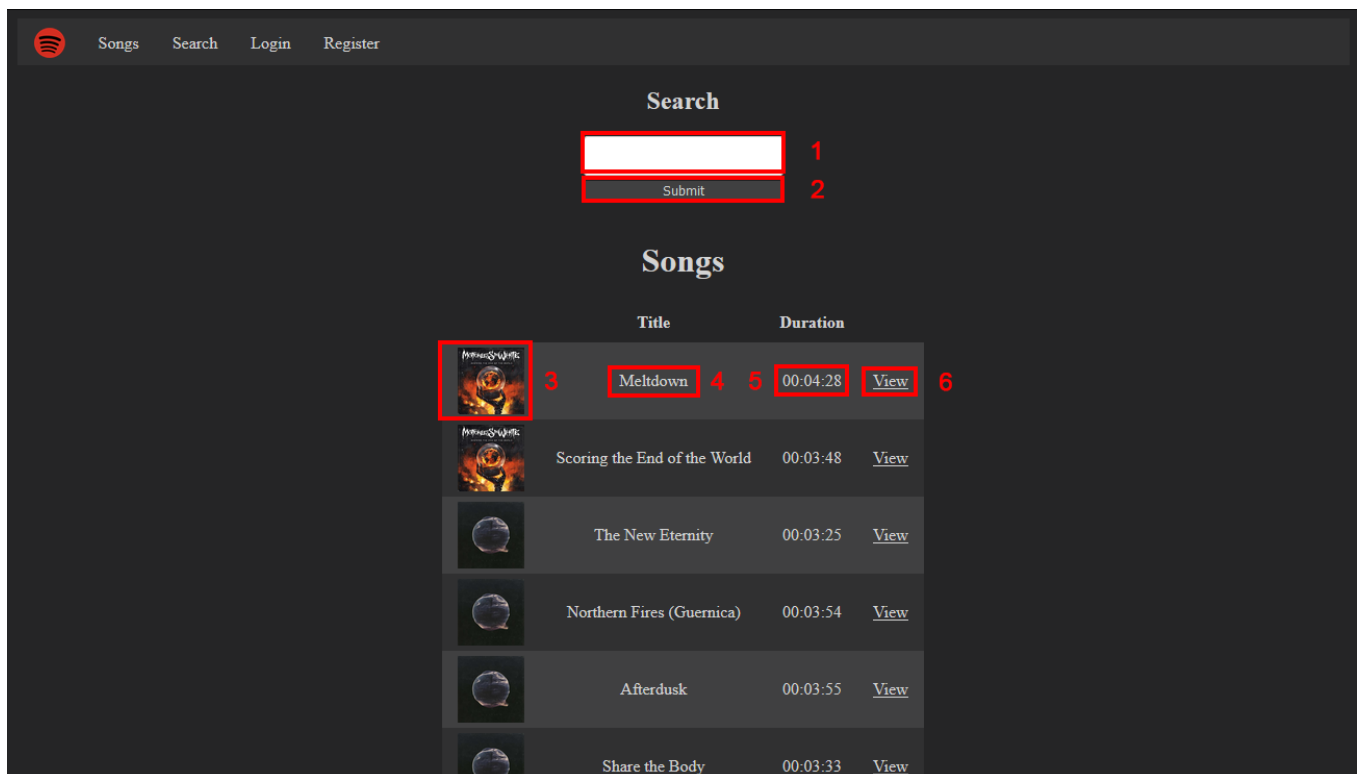4. Navigate to Login.
5. Navigate to Register.

Song List

The song list that an unregistered user can see. Note the lack of "Play" and "Add to Queue" buttons, as playing music is a functionality reserved for premium users.
1. Song image.
2. Song title.
3. Song duration.
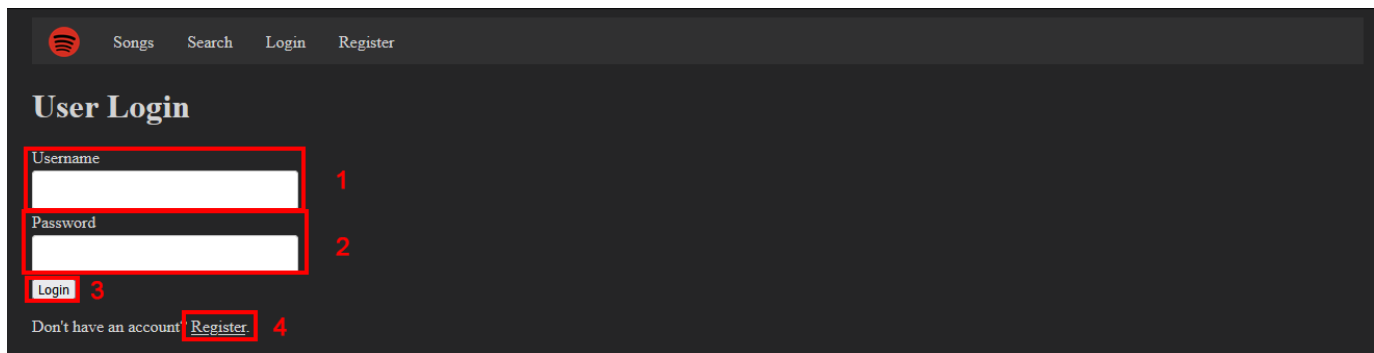4. Click to view song details.

Search Page

The search page takes a query string and uses it to search the music database, returning all songs, albums, and artists that contain the query as a substring. Not pictured in the screenshot is the search results of Albums and Artists underneath

the results of Songs.

1. Click to type in a string to search for.

2. Click to submit your search. The list of songs, albums, and artists below will update to show only ones where some portion of their name matches your search query.

3. Song image.

4. Song title.

5. Song duration.

6. Click to view song details.

User Login

The "Login" button from the top menubar or the home screen will direct you here, prompting you to log in. Failing to log in will notify you of the error and allow you to try again.

1. Click to type in your username.

2. Click to type in your password.

3. Click to attempt to log in with the username and password you have typed.

4. Navigate to the register page if you do not have an account yet.

User Register

If you need to register you need to enter a unique username and a password. The password is securely stored in the database under the SHA256 hash algorithm. Once your account has been created you will be directed to the login page to securely log in with your new free account.

1. Click to type in a username you would like the new account to have.

2. Click to type in a password for the new account.

3. Click to type in the same password to verify that you have not made an error in the previous text box.

4. Click to submit a request to create the new account.

5. Click to reset the text fields if you wish to clear them and start over.

6. Navigate to the login page if you already have an account.

Free User

Home Page
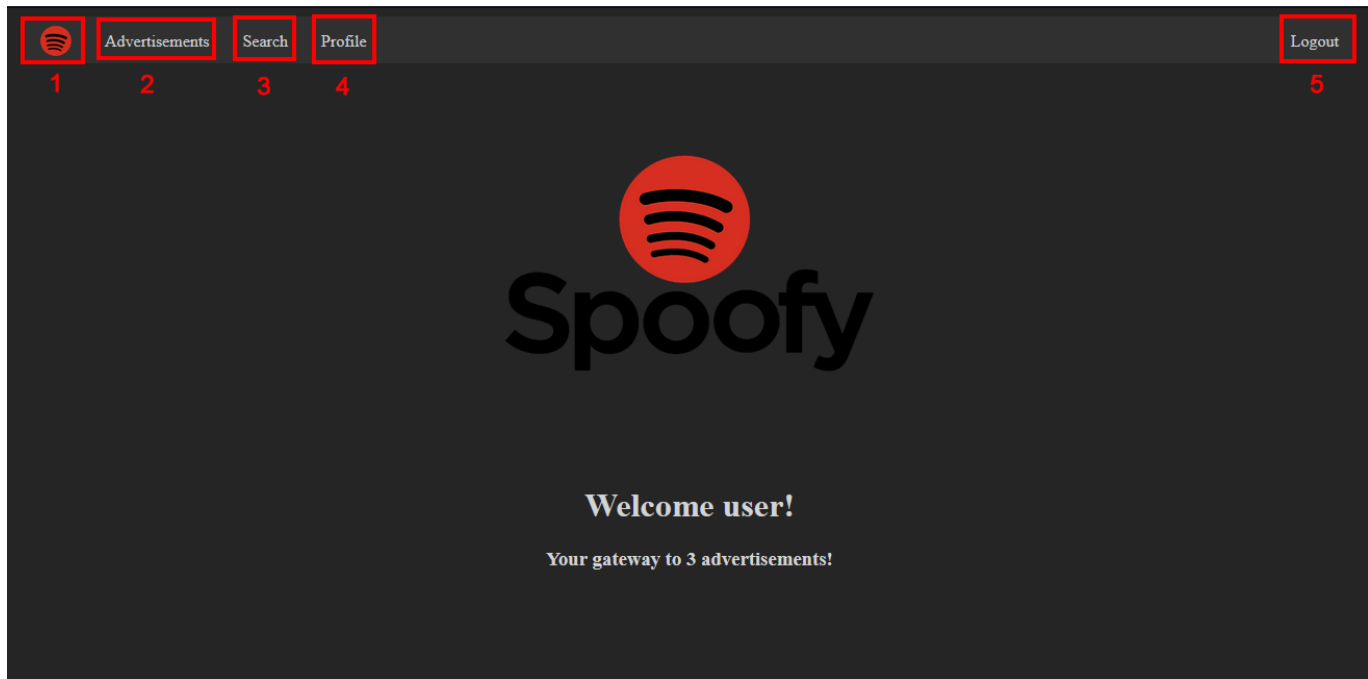
After logging in as a free user you will see the home page. As free users can only access advertisements, the option to go to the Song List page is disabled and replaced by an Advertisements page. Note the addition of the Profile button in the menubar.

1. Website logo. Click at any point to return to this home page.
2. Navigate to Advertisements.
3. Navigate to Search.
4. Navigate to your account's Profile.
5. Click to log out of your account.

Advertisement List

Navigating to the advertisements page will show this list of ads. Ads can be viewed from here. As a registered user you can now play them, adding them to the queue.

1. Click to view the advertisement.
2. Click to play the advertisement.
3. Click to add the advertisement to your queue.

Search Page

Similar to the search page for music, this search page takes a string from the user as a query. This will return the list of all advertisements that contain the query as a substring. As with the advertisements page, ads can be viewed and played from here.

1. Click to type in a string to search for.
2. Click to submit your search. The list of songs, albums, and artists below will update to show only ones where some portion of their name matches your search query.
3. Click to view the advertisement.
4. Click to play the advertisement.
5. Click to add the advertisement to your queue.

Profile Page

The profile page of a free user. Note that free accounts cannot create or use playlists, as that functionality is reserved for premium users.

1. Your username.
2. Your account type.
3. Click to log out of your account.
4. Click to upgrade your account's membership from Free, which can only view ads, to Premium, which can view songs, albums, and artists, and create playlists.

Premium User

Home Page
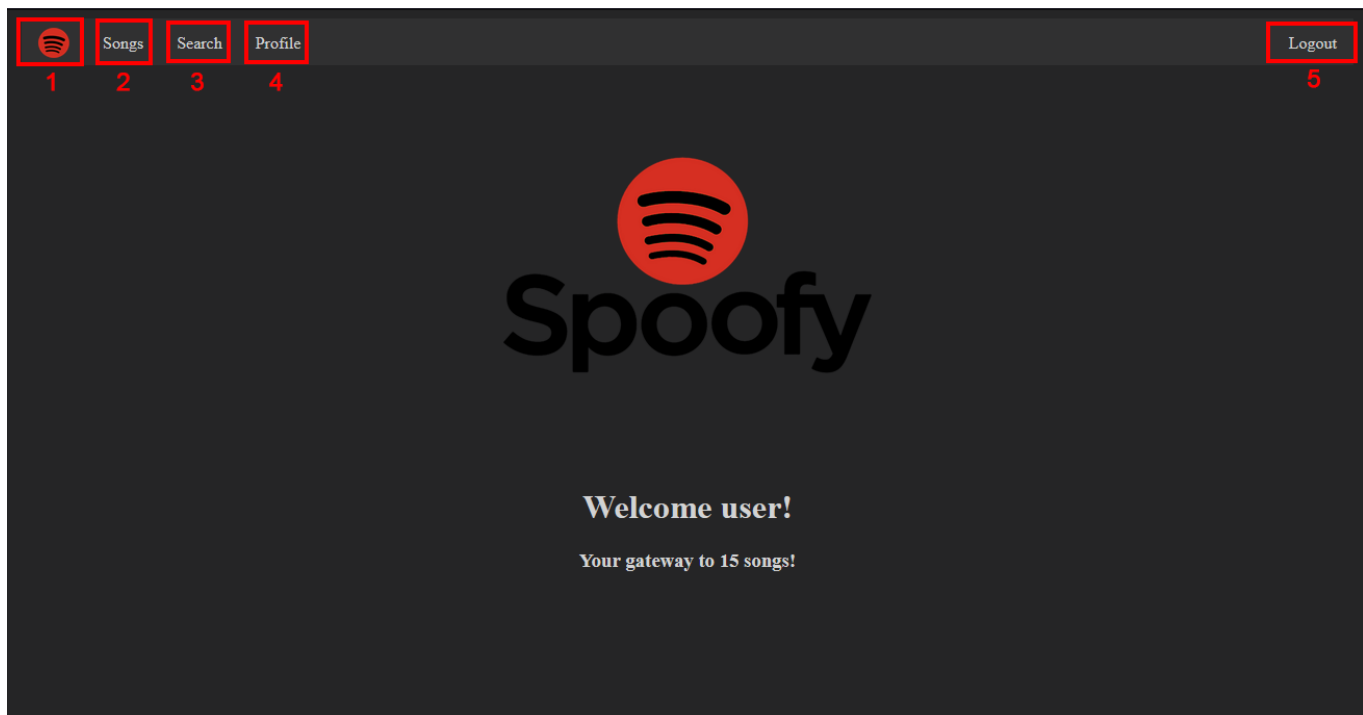
The home page for a premium user. Note that this user can view the Song List, instead of Advertisements.
1. Website logo. Click at any point to return to this home page.
2. Navigate to Advertisements.
3. Navigate to Search.
4. Navigate to your account's Profile.
5. Click to log out of your account.

Song List
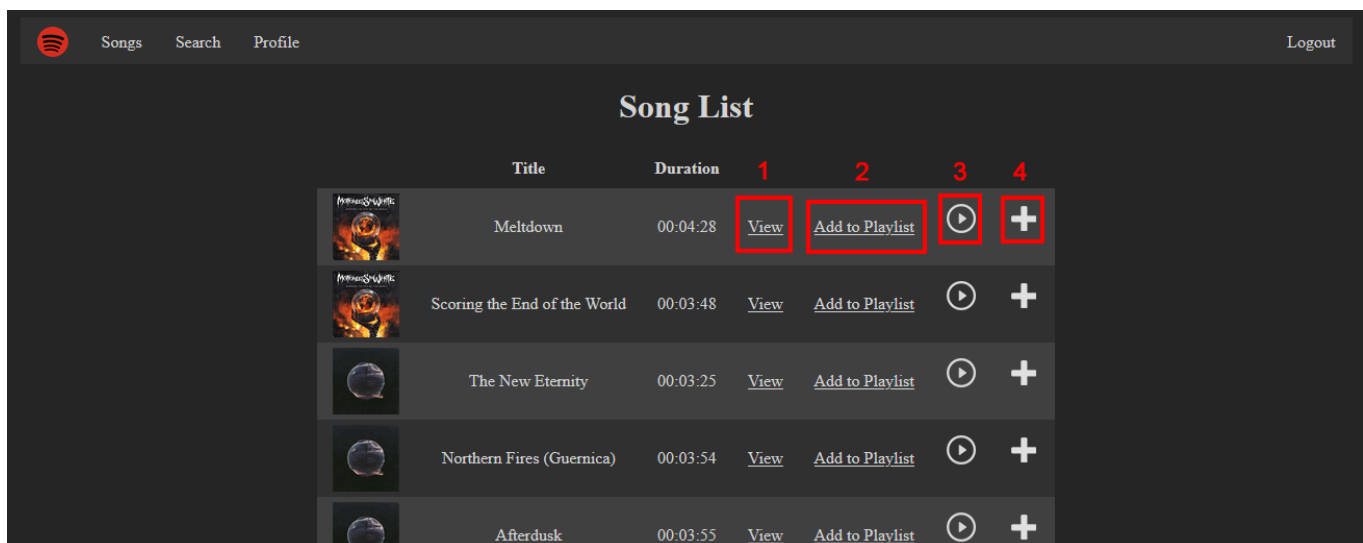
The songs list page for a premium user. Similar to the song list page for an unregistered user, premium users have the additional functionality of being able to add songs to playlists, play songs, and add them to the queue.
1. Click to view the details of the song.
2. Click to add the song to one of your playlists.
3. Click to play the song.

4. Click to add the song to your queue.

Song Page

A page dedicated to a single song. It shows metadata for that song, such as the title, number of plays and the duration. As a premium user, you are able to play the song, add it to the music queue, or add it to a playlist. You can also enable or disable different music stems that will remain in that state until you log out.
1. The song's title.
2. The song's cover art.
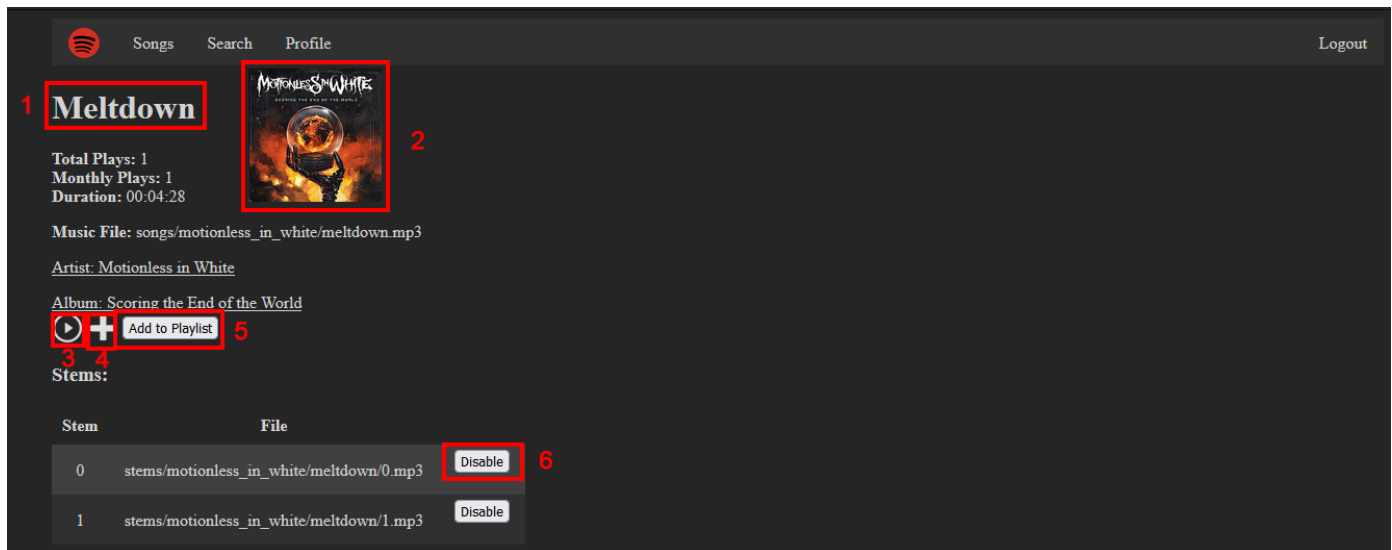3. Click to play the song.
4. Click to add the song to your queue.
5. Click to add the song to one of your playlists.
6. Click to disable one of the stems of the song.

Search Page
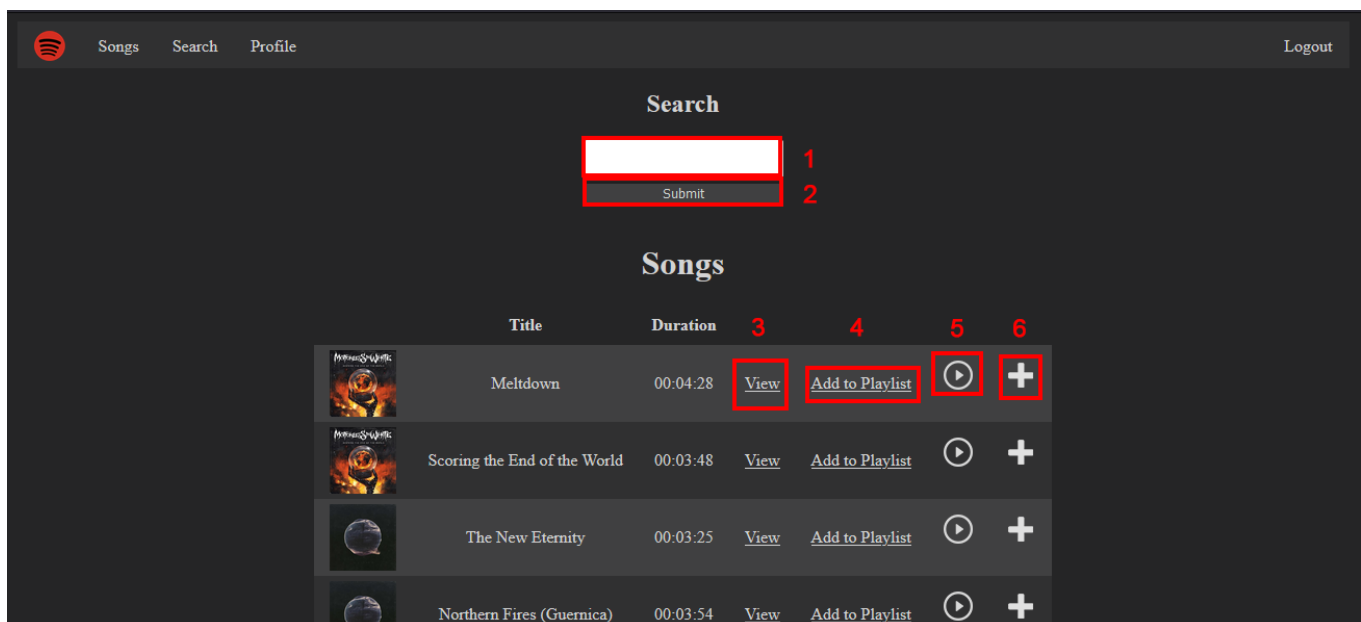
The search page of a premium user. Similar to the search page of an unregistered user, it shows Songs, Albums, and Artists that fit the search query. Additional functionality is permitted as you can add songs to playlists and play songs or albums.

1. Click to type in a string to search for.
2. Click to submit your search. The list of songs, albums, and artists below will update to show only ones where some portion of their name matches your search query.
3. Click to view song details.
4. Click to add the song to one of your playlists.
5. Click to play the song.
6. Click to add the song to your queue.

Song Queue
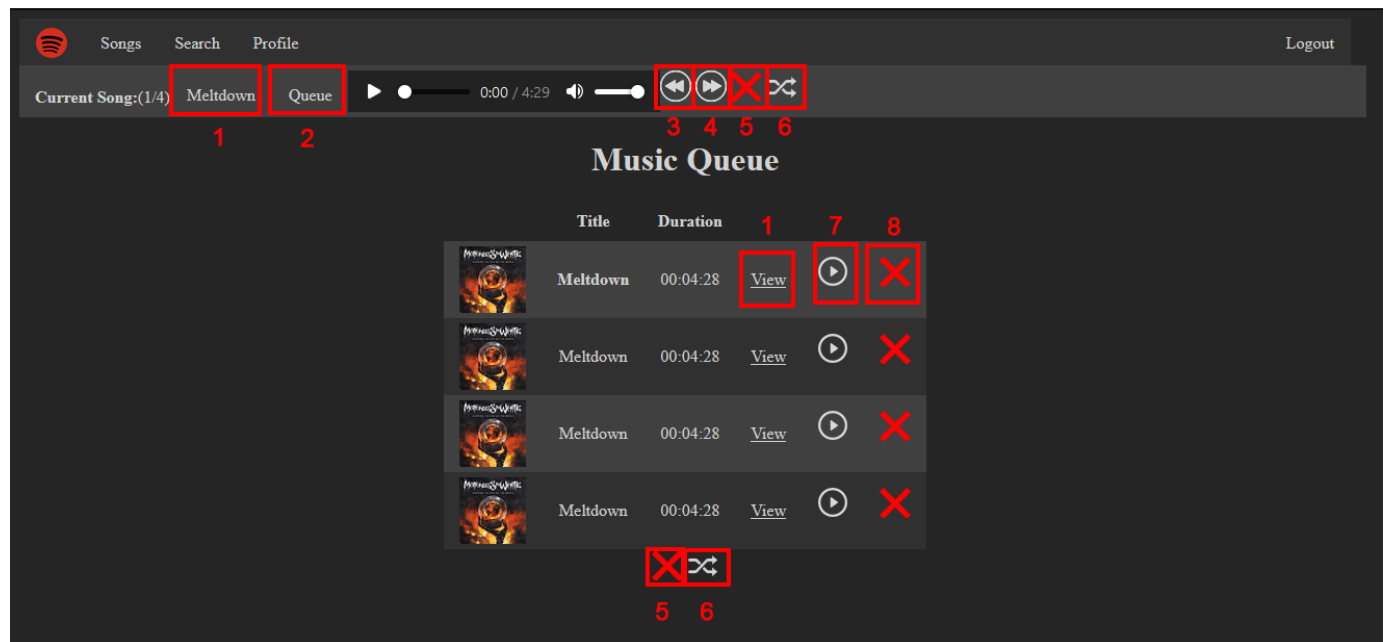

The current song queue. Whenever you play a song or album, or add a song to the queue, it will create a music queue that stores the list of songs you are listening to. You have several options to change the currently playing song, while also being able to shuffle and clear the queue. The queue bar at the top of the screen will persist on any other screen as long as you are logged in and there are songs in the queue.
1. The current song in the queue. Clicking it will navigate to that song's page.
2. Click to view the current queue (the page that is open in the screenshot).
3. Click this button to set the current song in the queue to the previous song, wrapping around to the last song if necessary.
4. Click this button to set the current song in the queue to the next song, wrapping around to the first song if necessary.
5. Click this button to clear the current queue and stop any music from playing.
6. Click this button to shuffle the queue, shuffling the list of songs and setting the current song to the first song of the list.
7. Click this button to play the specified song, setting the current song to the song that is being selected.
8. Click this button to remove the specified song from the queue.

Profile Page
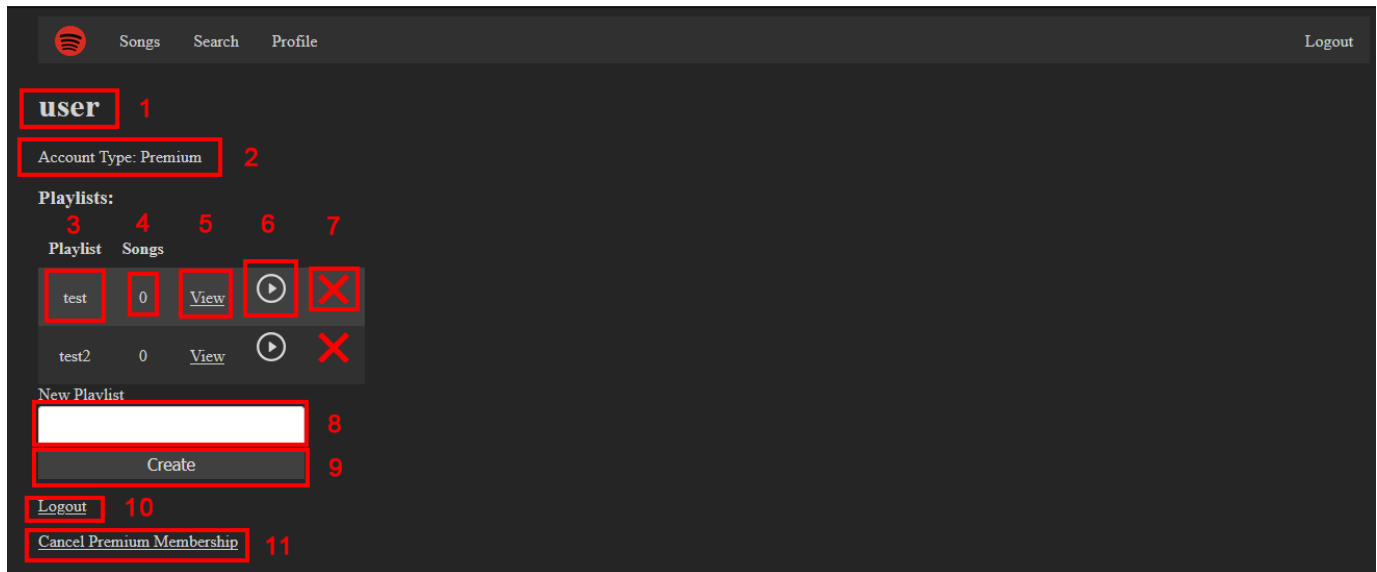
Your profile page as a premium user. Similar to the free user, however you have the ability to create, edit, and play playlists.

1. Your username.
2. Your account type.
3. The playlist name of a given playlist, stored in the database under this user's ID.
4. The number of songs in the playlist. A playlist is simply a list of songs.
5. Click to go to the page dedicated to that playlist. To view the associated songs and make changes to the list.
6. Click to play this playlist, clearing the current queue and setting the queue to be the list of songs in the playlist.
7. Click to delete this playlist, removing it from your account.
8. The text field to enter the name of a new playlist.
9. Click this button to create the new playlist, under the name specified in 8.
10. Click to log out of your account.
11. Click to cancel your premium membership, reverting your account from premium to free that can only view ads.

Add Song to Playlist
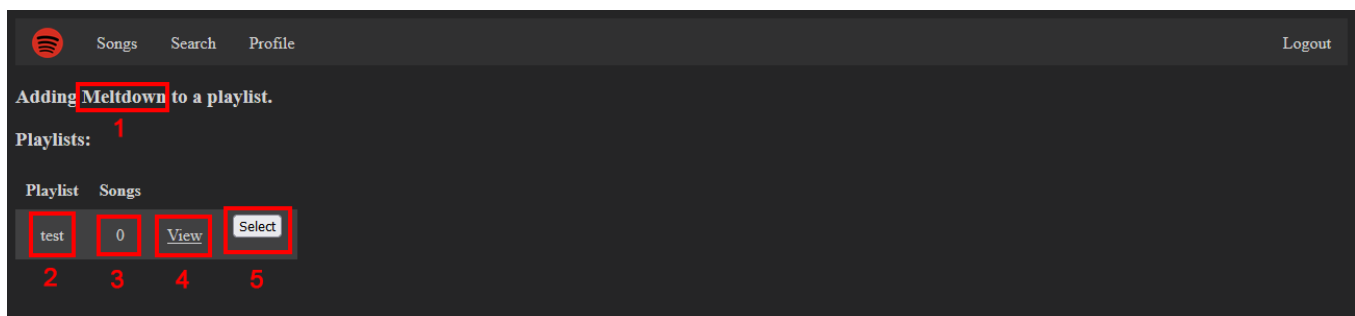
This menu comes up when you choose to add a song to a playlist. It will show all of the playlists attached to your account, and you can select the one to add it to. This will be stored in the database and will persist when you log out.

1. The title of the song that is currently being added to a playlist.
2. The name of a given playlist.
3. The number of songs in a playlist.
4. Click this button to view the playlist before adding the song to it.
5. Click this button to add the song to the chosen playlist.

View Playlist
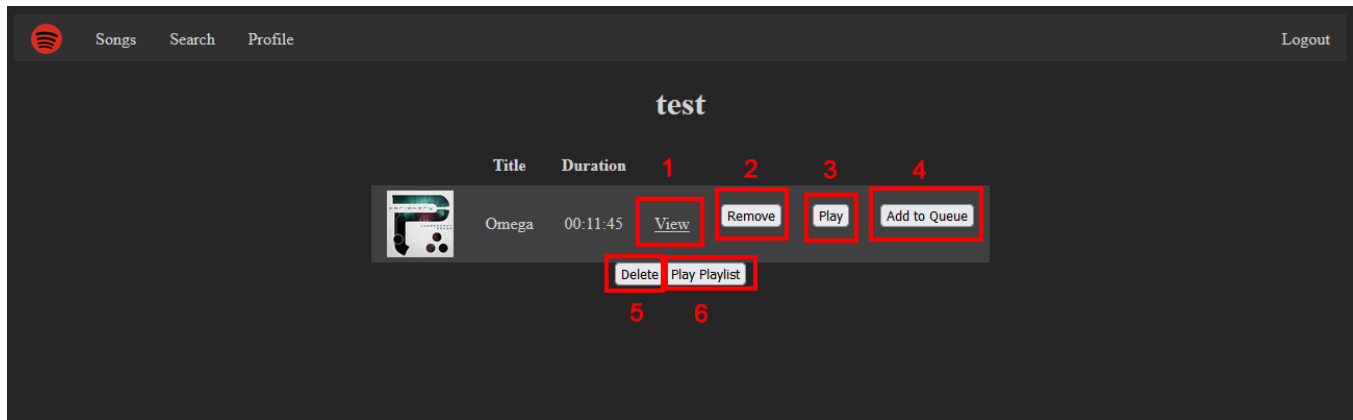
Viewing a playlist simply displays the list of songs present in it. You have options to play any song present in the playlist, or play the entire thing.

1. Click this button to view the song page of a given song.
2. Click this button to remove a song from the playlist.
3. Click this button to play this song, clearing the current queue if there is one.
4. Click this button to add the song to the end of the queue, creating a queue if necessary.
5. Click this button to delete the playlist from your account.
6. Click this button to play the whole playlist, clearing the current queue if there is one.

Admin

Home Page
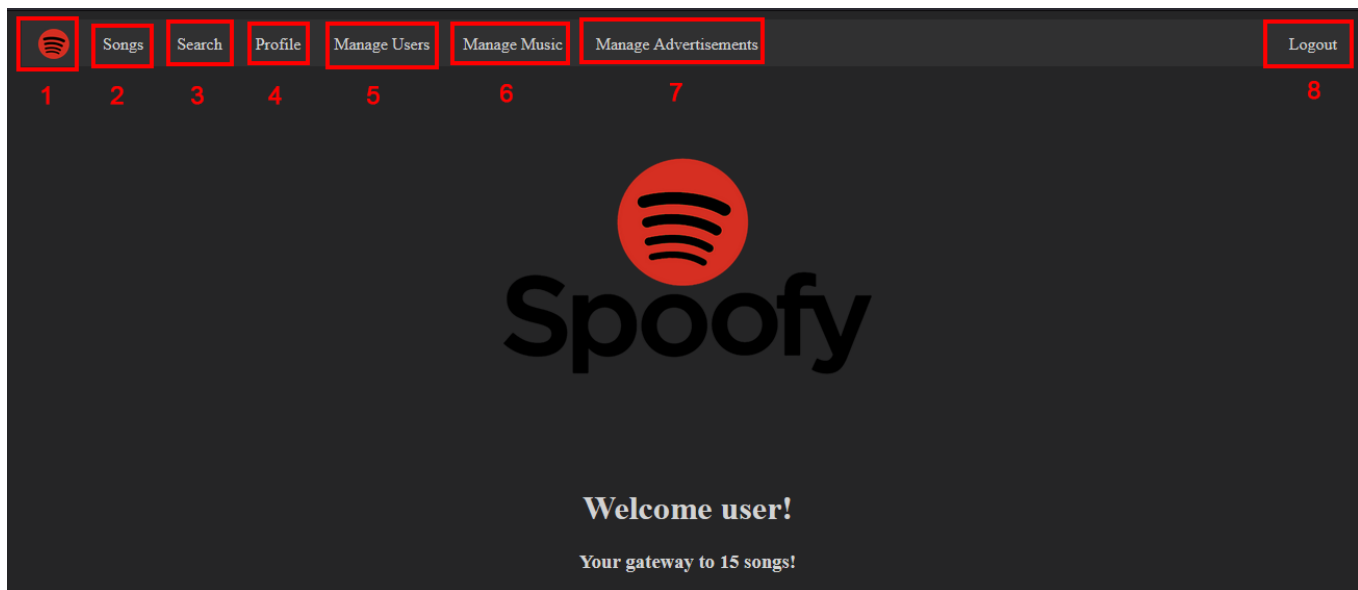
1. Website logo. Click at any point to return to this home page.
2. Navigate to Advertisements.
3. Navigate to Search.
4. Navigate to your account's Profile.
5. Navigate to the user management page.
6. Navigate to the song management page.
7. Navigate to the advertisement management page.
8. Click to log out of your account.

Manage Users
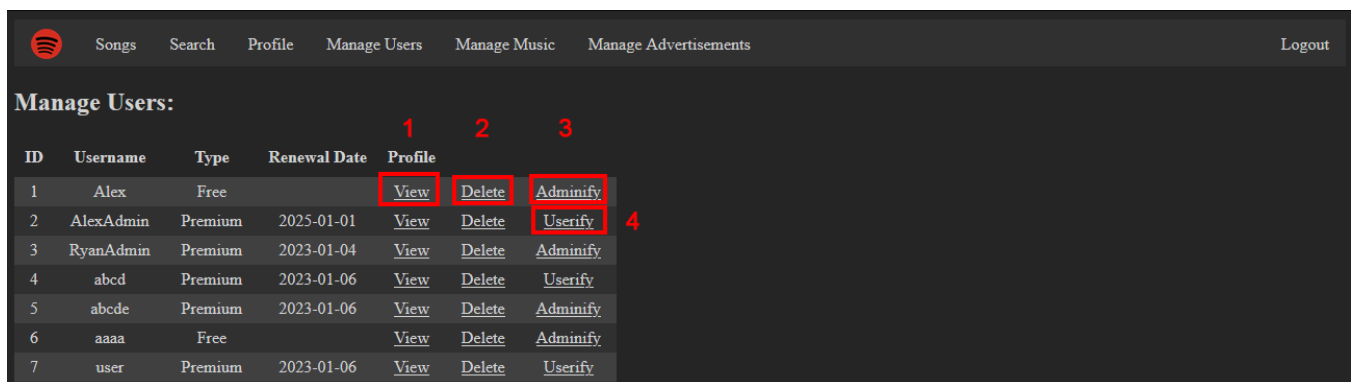
1. Click to view the profile of the user.
2. Click to delete the user's account from the service.
3. Click to turn a user account into an administrator account.
4. Click to turn an administrator account into a user account.

Manage Songs

1. Navigate to the artist management page.
2. Navigate to the album management page.
3. Click to add a new song.
4. Click to add an existing song to an existing album.
5. Click to give an existing artist credit for an existing song.
6. Click to delete the song.
7. Click to reset the song's monthly plays.

Add Song

1. Click to type in the song's title.
2. Click to type in the song's duration in hh:mm:ss format.
3. Click to type in the file path to the song audio file.
4. Click to add the song to the database.
5. Click to reset the text boxes if you want to start fresh.
6. Navigate back to the song management page.

Add Song to Album

1. Click to input the ID number of the song you'd like to add to the album (listed below for reference).
2. Click to input the ID number of the album you'd like the song to be added to (listed below for reference).
3. Click to add the song to the album.
4. Navigate back to the song management page.

Add Song Credit

1. Click to input the ID number of the song you'd like to credit the artist for (listed below for reference).
2. Click to input the ID number of the artist you'd like to give song credit to (listed below for reference).
3. Click to add the credit for the song to the artist.
4. Navigate back to the song management page.

Manage Artist

1. Navigate to the song management page.

2. Navigate to the album management page.
3. Click to add a new artist.
4. Click to delete the artist from the database.
5. Click to edit the artist's details
6. Click to remove a song or an album from being associated with the artist.

Add Artist

1. Click to type the name of the new artist.
2. Click to type a brief description of the artist.
3. Click to type the file path to the profile picture for the artist.
4. Click to type the file path to the banner picture for the artist.
5. Click to add the new artist to the database.
6. Click to reset the text boxes if you want to start fresh.
7. Navigate back to the artist management page.

Manage Album

1. Navigate to the artist management page.
2. Navigate to the song management page.
3. Click to add a new album.
4. Click to give an artist writing credit for an album.
5. Click to delete the album from the database.
6. Click to edit the album's details.
7. Click to remove a song from the album.

Add Album

1. Click to type the title of the new album.
2. Click to type a 1 if the new album is a single, or a 0 if it is not a single.
3. Click to type the file path to the album's cover art.
4. Click to type the release date of the album in yyyy-mm-dd format.
5. Click to type the genre of the album.

6. Click to add the new album to the database.
7. Click to reset the text boxes if you want to start fresh.
8. Navigate back to the album management page.

Add Album Credit

1. Click to input the ID number of the album you'd like to credit the artist for (listed below for reference).
2. Click to input the ID number of the artist you'd like credit for the album. (listed below for reference).
3. Click to credit the artist for the album.
4. Navigate back to the album management page.

Manage Ads

1. Click to type the duration of a new ad in hh:mm:ss format.
2. Click to type the name of the company a new ad is promoting.
3. Click to type the file path to the sound file of a new ad.
4. Click to add a new advertisement to the database.
5. Click to delete the advertisement from the database.

Appendix

Below is our mysql sample data. This sample data can be generated from a python script available in the github repository and usage is detailed in the readme for that repo.
https://github.com/alexs2112/CPSC471_Spoofy

Refreshing the default database:

```
C:\CPSC471_Spoofy>python InitDB/initialize.py refresh
Connection to SpoofyDB established.
Dropping tables in SpoofyDB.
Creating tables in SpoofyDB.
Populating tables with default data.
```

MySQL output from the MySQL 8.0 Command Line Client:

```
mysql> USE SpoofyDB;
Database changed
mysql> SHOW TABLES;
+--------------------+
| Tables_in_spoofydb |
+--------------------+
| admin              |
| advertisement      |
| album              |
| album_contains     |
| artist             |
| distributor        |
| has                |
| playlist           |
| playlist_contains  |
| represents         |
| song               |
| stem               |
| user               |
| writes             |
+--------------------+
14 rows in set (0.02 sec)

mysql> SELECT * FROM USER;
+--------+----------+--------------+-----------+--------------+
| UserID | Username | PasswordHash | IsPremium | SubRenewDate |
+--------+----------+--------------+-----------+--------------+
|      1 | Free     | <hash>       |         0 | NULL         |
|      2 | Admin    | <hash>       |         1 | 2025-01-01   |
|      3 | Free2    | <hash>       |         1 | 2023-01-04   |
+--------+----------+--------------+-----------+--------------+
3 rows in set (0.00 sec)z

mysql> SELECT * FROM ADMIN;
+---------+
| AdminID |
+---------+
|       2 |
+---------+
1 row in set (0.01 sec)
```

```
mysql> SELECT SongID, TotalPlays, MonthlyPlays, Title, Duration FROM SONG;
+--------+------------+--------------+-----------------------------+----------+
| SongID | TotalPlays | MonthlyPlays | Title                       | Duration |
+--------+------------+--------------+-----------------------------+----------+
|      1 |          0 |            0 | Meltdown                    | 00:04:28 |
|      2 |          0 |            0 | Scoring the End of the World | 00:03:48 |
|      3 |          0 |            0 | The New Eternity            | 00:03:25 |
|      4 |          0 |            0 | Northern Fires (Guernica)   | 00:03:54 |
|      5 |          0 |            0 | Afterdusk                   | 00:03:55 |
|      6 |          0 |            0 | Share the Body              | 00:03:33 |
|      7 |          0 |            0 | Firstborn (Ya'aburnee)      | 00:05:07 |
|      8 |          0 |            0 | 22 Faces                    | 00:03:51 |
|      9 |          0 |            0 | Omega                       | 00:11:45 |
|     10 |          0 |            0 | The Pot                     | 00:06:18 |
|     11 |          0 |            0 | Rosetta Stoned              | 00:11:13 |
|     12 |          0 |            0 | Elysium                     | 00:04:49 |
|     13 |          0 |            0 | Blinded                     | 00:03:22 |
|     14 |          0 |            0 | Stabbing in the Dark        | 00:04:40 |
|     15 |          0 |            0 | A Grave Mistake             | 00:03:04 |
+--------+------------+--------------+-----------------------------+----------+
15 rows in set (0.00 sec)

mysql> SELECT SongID, MusicFILE FROM SONG;
+--------+-------------------------------------------------------------+
| SongID | MusicFILE                                                   |
+--------+-------------------------------------------------------------+
|      1 | songs/motionless_in_white/meltdown.mp3                      |
|      2 | songs/motionless_in_white/scoring_the_end_of_the_world.mp3  |
|      3 | songs/silent_planet/the_new_eternity.mp3                    |
|      4 | songs/silent_planet/northern_fires.mp3                      |
|      5 | songs/silent_planet/afterdusk.mp3                           |
|      6 | songs/silent_planet/share_the_body.mp3                      |
|      7 | songs/silent_planet/firstborn.mp3                           |
|      8 | songs/periphery/22_faces.mp3                                |
|      9 | songs/periphery/omega.mp3                                   |
|     10 | songs/tool/the_pot.mp3                                      |
|     11 | songs/tool/rosetta_stoned.mp3                               |
|     12 | songs/invent_animate/elysium.mp3                            |
|     13 | songs/as_i_lay_dying/blinded.mp3                            |
|     14 | songs/ice_nine_kills/stabbing_in_the_dark.mp3               |
|     15 | songs/ice_nine_kills/a_grave_mistake.mp3                    |
+--------+-------------------------------------------------------------+
15 rows in set (0.00 sec)
```

```
mysql> SELECT * FROM STEM;
+--------+--------+------------------------------------------------------------------+
| SongID | StemNo | MusicFile                                                        |
+--------+--------+------------------------------------------------------------------+
|      1 |      0 | stems/motionless_in_white/meltdown/0.mp3                         |
|      1 |      1 | stems/motionless_in_white/meltdown/1.mp3                         |
|      2 |      0 | stems/motionless_in_white/scoring_the_end_of_the_world/0.mp3     |
|      2 |      1 | stems/motionless_in_white/scoring_the_end_of_the_world/1.mp3     |
|      2 |      2 | stems/motionless_in_white/scoring_the_end_of_the_world/2.mp3     |
|      2 |      3 | stems/motionless_in_white/scoring_the_end_of_the_world/3.mp3     |
|      3 |      0 | stems/silent_planet/the_new_eternity/0.mp3                       |
|      3 |      1 | stems/silent_planet/the_new_eternity/1.mp3                       |
|      3 |      2 | stems/silent_planet/the_new_eternity/2.mp3                       |
|      4 |      0 | stems/silent_planet/northern_fires/0.mp3                         |
|      4 |      1 | stems/silent_planet/northern_fires/1.mp3                         |
|      4 |      2 | stems/silent_planet/northern_fires/2.mp3                         |
|      5 |      0 | stems/silent_planet/afterdusk/0.mp3                              |
|      5 |      1 | stems/silent_planet/afterdusk/1.mp3                              |
|      5 |      2 | stems/silent_planet/afterdusk/2.mp3                              |
|      5 |      3 | stems/silent_planet/afterdusk/3.mp3                              |
|      6 |      0 | stems/silent_planet/share_the_body/0.mp3                         |
|      6 |      1 | stems/silent_planet/share_the_body/1.mp3                         |
|      7 |      0 | stems/silent_planet/firstborn/0.mp3                              |
|      7 |      1 | stems/silent_planet/firstborn/1.mp3                              |
|      7 |      2 | stems/silent_planet/firstborn/2.mp3                              |
|      7 |      3 | stems/silent_planet/firstborn/3.mp3                              |
|      8 |      0 | stems/periphery/22_faces/0.mp3                                   |
|      8 |      1 | stems/periphery/22_faces/1.mp3                                   |
|      8 |      2 | stems/periphery/22_faces/2.mp3                                   |
|      9 |      0 | stems/periphery/omega/0.mp3                                      |
|      9 |      1 | stems/periphery/omega/1.mp3                                      |
|      9 |      2 | stems/periphery/omega/2.mp3                                      |
|      9 |      3 | stems/periphery/omega/3.mp3                                      |
|      9 |      4 | stems/periphery/omega/4.mp3                                      |
|     10 |      0 | stems/tool/the_pot/0.mp3                                         |
|     10 |      1 | stems/tool/the_pot/1.mp3                                         |
|     10 |      2 | stems/tool/the_pot/2.mp3                                         |
|     11 |      0 | stems/tool/rosetta_stoned/0.mp3                                  |
|     11 |      1 | stems/tool/rosetta_stoned/1.mp3                                  |
|     11 |      2 | stems/tool/rosetta_stoned/2.mp3                                  |
|     11 |      3 | stems/tool/rosetta_stoned/3.mp3                                  |
|     11 |      4 | stems/tool/rosetta_stoned/4.mp3                                  |
|     12 |      0 | stems/invent_animate/elysium/0.mp3                               |
|     12 |      1 | stems/invent_animate/elysium/1.mp3                               |
|     12 |      2 | stems/invent_animate/elysium/2.mp3                               |
|     13 |      0 | stems/as_i_lay_dying/blinded/0.mp3                               |
|     13 |      1 | stems/as_i_lay_dying/blinded/1.mp3                               |
|     13 |      2 | stems/as_i_lay_dying/blinded/2.mp3                               |
|     13 |      3 | stems/as_i_lay_dying/blinded/3.mp3                               |
|     14 |      0 | stems/ice_nine_kills/stabbing_in_the_dark/0.mp3                  |
|     14 |      1 | stems/ice_nine_kills/stabbing_in_the_dark/1.mp3                  |
|     15 |      0 | stems/ice_nine_kills/a_grave_mistake/0.mp3                       |
|     15 |      1 | stems/ice_nine_kills/a_grave_mistake/1.mp3                       |
|     15 |      2 | stems/ice_nine_kills/a_grave_mistake/2.mp3                       |
+--------+--------+------------------------------------------------------------------+
50 rows in set (0.01 sec)
```

```
mysql> SELECT * FROM PLAYLIST;
+------------+--------------+-----------+
| PlaylistID | PlaylistName | CreatorID |
+------------+--------------+-----------+
|          1 | Playlist     |         2 |
+------------+--------------+-----------+
1 row in set (0.00 sec)

mysql> SELECT * FROM PLAYLIST_CONTAINS;
+------------+--------+
| PlaylistID | SongID |
+------------+--------+
|          1 |      3 |
|          1 |      5 |
|          1 |      8 |
+------------+--------+
3 rows in set (0.00 sec)

mysql> SELECT * FROM ADVERTISEMENT;
+------+----------+-------------+----------------------+
| AdID | Duration | Company     | SoundFile            |
+------+----------+-------------+----------------------+
|    1 | 01:00:01 | Live Nation | ads/live_nation_0.mp3 |
|    2 | 00:04:21 | Spotify     | ads/spotify_0.mp3    |
|    3 | 00:03:51 | Apple Music | ads/apple_music_0.mp3 |
+------+----------+-------------+----------------------+
3 rows in set (0.00 sec)

mysql> SELECT * FROM DISTRIBUTOR;
+--------------+-----------------+
| DistributorID | DistributorName |
+--------------+-----------------+
|            1 | BigDistribute   |
|            2 | Yeet            |
|            3 | DistributorA    |
|            4 | Diztributor     |
+--------------+-----------------+
4 rows in set (0.00 sec)

mysql> SELECT ArtistID, Name, TotalPlays, MonthlyPlays FROM ARTIST;
+----------+--------------------+------------+--------------+
| ArtistID | Name               | TotalPlays | MonthlyPlays |
+----------+--------------------+------------+--------------+
|        1 | Motionless in White |          0 |            0 |
|        2 | Silent Planet      |          0 |            0 |
|        3 | Periphery          |          0 |            0 |
|        4 | Tool               |          0 |            0 |
|        5 | Invent Animate     |          0 |            0 |
|        6 | As I Lay Dying     |          0 |            0 |
|        7 | Ice Nine Kills     |          0 |            0 |
+----------+--------------------+------------+--------------+
7 rows in set (0.00 sec)
Note: About, ProfilePicture, BannerPicture omitted due to length
```

```
mysql> SELECT * FROM REPRESENTS;
+----------+---------------+
| ArtistID | DistributorID |
+----------+---------------+
|        1 |             1 |
|        2 |             1 |
|        3 |             1 |
|        4 |             2 |
|        5 |             3 |
|        6 |             3 |
|        7 |             4 |
+----------+---------------+
7 rows in set (0.00 sec)

mysql> SELECT * FROM WRITES;
+--------+----------+
| SongID | ArtistID |
+--------+----------+
|      1 |        1 |
|      2 |        1 |
|      3 |        2 |
|      4 |        2 |
|      5 |        2 |
|      6 |        2 |
|      7 |        2 |
|      8 |        3 |
|      9 |        3 |
|     10 |        4 |
|     11 |        4 |
|     12 |        5 |
|     13 |        6 |
|     14 |        7 |
|     15 |        7 |
+--------+----------+
15 rows in set (0.00 sec)

mysql> SELECT AlbumID, IsSingle, ReleaseDate, Genre, Title FROM ALBUM;
+---------+----------+-------------+-------+-----------------------------+
| AlbumID | IsSingle | ReleaseDate | Genre | Title                       |
+---------+----------+-------------+-------+-----------------------------+
|       1 |        0 | 2022-06-10  | Metal | Scoring the End of the World |
|       2 |        0 | 2018-11-02  | Metal | When the End Began          |
|       3 |        0 | 2015-01-27  | Djent | Juggernaut: Alpha           |
|       4 |        0 | 2015-01-27  | Djent | Juggernaut: Omega           |
|       5 |        0 | 2006-04-28  | Rock  | 10,000 Days                 |
|       6 |        1 | 2022-11-08  | Metal | Elysium                     |
|       7 |        0 | 2019-09-20  | Metal | Shaped by Fire              |
|       8 |        0 | 2018-10-05  | Metal | The Silver Scream           |
+---------+----------+-------------+-------+-----------------------------+
8 rows in set (0.00 sec)
```

```
mysql> SELECT ALBUMID, CoverArt FROM ALBUM;
+---------+----------------------------------------+
| ALBUMID | CoverArt                               |
+---------+----------------------------------------+
|       1 | covers/scoring_the_end_of_the_world.png |
|       2 | covers/when_the_end_began.png          |
|       3 | covers/juggernaut_alpha.png            |
|       4 | covers/juggernaut_omega.png            |
|       5 | covers/10000_days.png                  |
|       6 | covers/elysium.png                     |
|       7 | covers/shaped_by_fire.png              |
|       8 | covers/the_silver_scream.png           |
+---------+----------------------------------------+
8 rows in set (0.00 sec)

mysql> SELECT * FROM HAS;
+---------+----------+
| AlbumID | ArtistID |
+---------+----------+
|       1 |        1 |
|       2 |        2 |
|       3 |        3 |
|       4 |        3 |
|       5 |        4 |
|       6 |        5 |
|       7 |        6 |
|       8 |        7 |
+---------+----------+
8 rows in set (0.00 sec)

mysql> SELECT * FROM ALBUM_CONTAINS;
+---------+--------+
| AlbumID | SongID |
+---------+--------+
|       1 |      1 |
|       1 |      2 |
|       2 |      3 |
|       2 |      4 |
|       2 |      5 |
|       2 |      6 |
|       2 |      7 |
|       3 |      8 |
|       4 |      9 |
|       5 |     10 |
|       5 |     11 |
|       6 |     12 |
|       7 |     13 |
|       8 |     14 |
|       8 |     15 |
+---------+--------+
15 rows in set (0.00 sec)
```

References

Learning Material:
    Lecture slides from module 4, parts A and B
    https://www.w3schools.com/php/
    https://www.php.net/docs.php
    https://www.tutorialspoint.com/php/index.html

General Help:
    https://httpd.apache.org/docs/2.4/platform/windows.html
    https://www.w3schools.com/css/css_background.asp
    https://www.w3schools.com/css/css_navbar_horizontal.asp
    https://www.w3schools.com/css/css_table_style.asp
    https://www.w3schools.com/css/css_table.asp
    https://stackoverflow.com/questions/34011559/how-do-i-add-my-logo-to-my-website-using-html
    https://stackoverflow.com/questions/8090195/how-do-i-align-in-my-image-to-move-it-vertically-upcss-html
    https://www.geeksforgeeks.org/how-to-change-an-input-button-image-using-css/
    https://www.php.net/manual/en/function.empty.php
    https://stackoverflow.com/a/369761

Tools:
    https://www.appserv.org/en/
    https://discord.com/   (group discussion and virtual meetings)
    https://www.overleaf.com/   (latex formatting)
    https://app.diagrams.net/   (diagram creation)
    https://github.com/   (git repository host)

Resources:
    https://twitter.com/   (profile and banner pics for artists)
    https://en.wikipedia.org/   (artist about section, album covers)