Spotifoo Player

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1.   About

Spotifoo is command line interface application, that allows you to stream music instead of downloading it from an unknown source. The user can listen to the songs according to his choice and he can able to choose the song based on his interest. We can only navigate by typing a number from an option list and then press enter to execute the command. Typing 0 and pressing enter in any part of the application will send you back to the main menu. This application is providing features to users like display all the songs, by category (album, artist and genre) and searching the songs by name.

2.   Project Overview

The application is a command line interface (terminal) application that does not have a graphical user interface. The user only navigates by typing a number from an option list and then press enter to execute the command. Typing 0 and pressing enter in any part of the application will send you back to the main menu.

2.1   Play Song

When pressing option #1 on the main menu, the app must show a list of songs by reading the text file located inside the asset folder. When the user chooses a specific song, the music file should open in the default music player installed in your computer. In addition, it should also open the corresponding album art. Or show a placeholder image if the album art is not found.

Note: Only open the album art, if the app can play the song.

2.2   Filter By Artist

When pressing option #2 on the main menu, the app will replace the main menu options with a list of artists available based on the .txt file. Typing the number corresponding to an artist will in turn, show a list of songs that belong to this artist.

2.3   Filter By Album

When pressing option #3 on the main menu, the app will replace the main menu options with a list of albums available based on the .txt file.

2.4   Filter By Genre

When pressing option #4 on the main menu, the app should show a list of genres. The only four genres available are:

1   Metal
2   Pop
3   Reggaeton
4   Rock

2.5   Search

When pressing option #5 on the main menu, the app should allow to perform a search based solely on the name of the songs. The app must prompt the user to input some text. Then the app must display a list of songs that matches the whole text or part of the text inside the name of a song. Example: The assets folder mentioned in the section "what we provide" has these songs:

- Welcome to the Jungle (Guns and Roses)
- Welcome to the family (Avenged Sevenfold)

If the user types "welcome" it should return both results and any other that matches the text. But if the user types "welcome to the jungle" it should only return the song from Guns and Roses.

2.6   Sample data

Spotifoo has permission from top artists around the world, to share their songs with us. Thus, we created a folder called **assets** with 2 sub folders. One for the music files with a bunch of .mp3 files and another for the album art in .png files.

We also provide a file called data.txt with the information about the song name, artist, album, genre, file name, and album image. Your app must read this file to display the list of songs and other features requested in the mandatory requirements listed below.

Note: The folder and text file, contain some invalid data on purpose. Do not try to edit the text inside data.txt or add missing files. Instead, write code to validate the errors.

3.   Implementation and Design

3.1   Technologies

The following technologies are used in designing and developing the Spotifoo application.

1. Java – Coding language for implementing the Spotifoo application
2. Eclipse - IDE Purpose
3. Visual Paradigm - UML Diagram tool
4. Microsoft word – Document preparation

3.2   Design and Flow diagram

3.2.1   Architecture and design

Simple MVC architecture shall be followed in designing the Spotifoo application, see below. Here Song, Artist, Album and Genre shall be acted as module, the controller shall be followed by a *Singleton* design pattern, it reads the songs data from the file which is provided by the customer and prepare the model object. This functionality shall be done only once and maintained model objects in the form of database cache using collections API.

Next, the view module is mainly responsible for preparing the menus by using controller cache data based on the *User* choice.
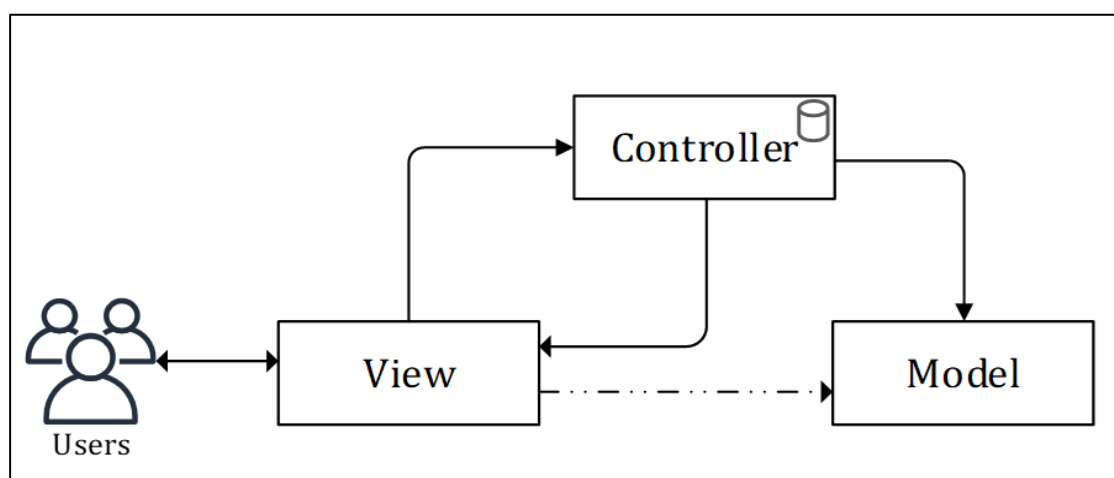

Figure 1 Architecture

3.2.2 Class diagram

This section shall be explained about the relationship between different classes.

Model: All the model classes shall be followed java bean's structure and implemented Comparable interface in order maintain the order while caching the data into collections API.

Controller: The *SpotifooController.java* is controller class which follows the singleton design pattern to maintain the single instance, it reads the customer provided songs data file in fixed format (i.e., comma separated values, see below) and caches the songs data in-memory in structured format for lateral usage.

Example: <song_name>,<artist_name>,<album_name>,<genre_name>,<file_name>,<image>

"Andy you are a star,The Killers,Hot fuss,rock,andy-you-are-a-star.mp3,hot-fuss.png"

View: The *SpotifooView.java* is responsible for building the user interface and displayed in the terminal/console based on the user inputs and performs the validation checks.

1. Title enumeration shall be used for constants purpose and holds the menus title.
2. Icon enumeration shall be holding the *Unicode characters* for icons which shall be shown along with the warning/errors message in the terminal.
3. *SpotifooApp.java* is a main class for the application and it invokes the start method of *SpotifooView* class.
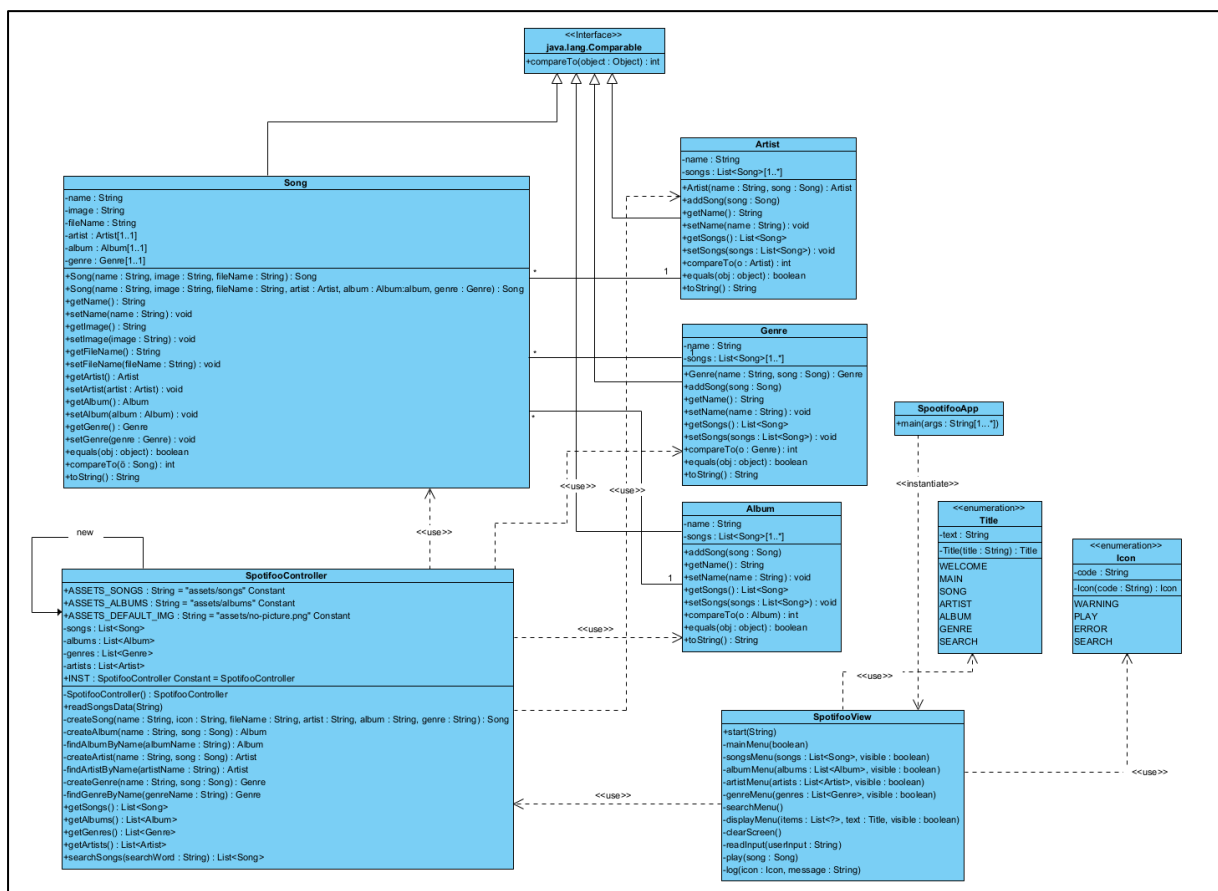

Figure 2 Class Diagram

3.2.3   Sequence diagram

The sequence diagram explains about the logic interaction between the objections in the system and execution flow.
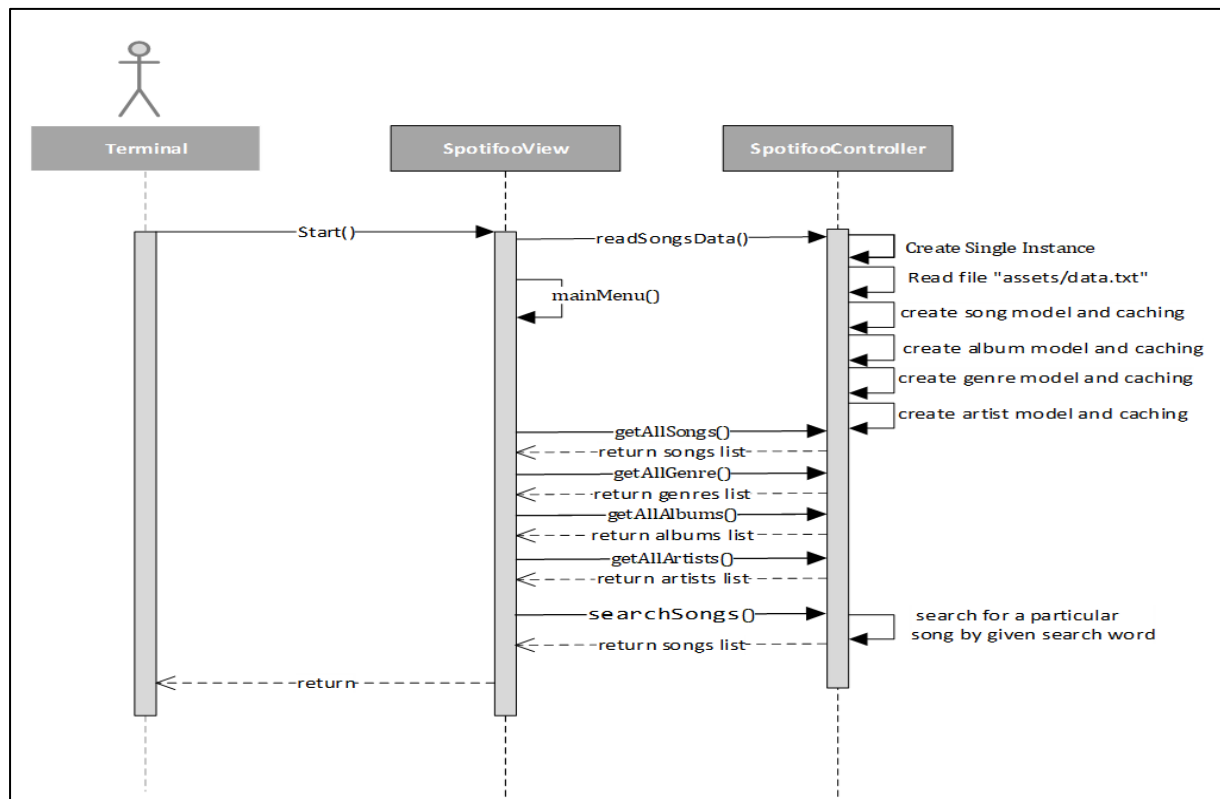

Figure 3 Sequence Diagram

3.2.4   Model diagram

The below picture explains about the module relationship and the below four models are introduced in Spotifoo application.

1   Songs.java – Responsible for holding the songs metadata like.

Field Name	Description
Name	Name of the song.
File name	Song file name with mp3 extension
Image	Image name of the song
Artist	Artist name of the song
Genre	Genre name of the song
Album	Album name of the song

Table 1 Songs Model

2   Album.java – Maintains the Album metadata like,

Field Name	Description
Name	Name of the album
Songs	List of songs which are belongs to this album

Table 2 Album Model

3   Artist.java – Responsible for holding the song artist metadata.

Field Name	Description
Name	Name of the artist
Songs	List of songs which are belongs to this Artist

Table 3 Artist Model

4   Genre.java - Responsible for holding the song Genre metadata.

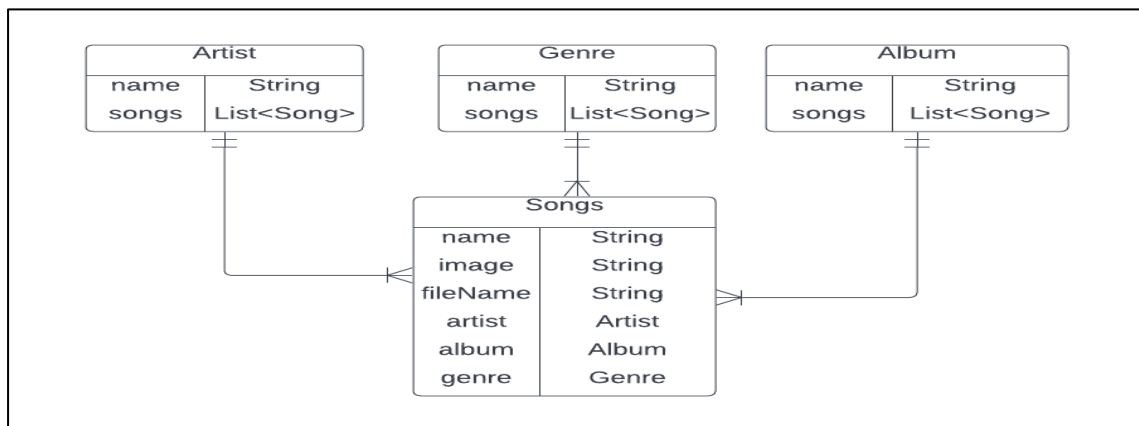| Field Name	Description
Name	Name of the genre
Songs	List of songs which are belongs to this Genre

Table 4 Genre Model

Figure 4 Model Diagram

3.2.5   Menus flow charts
This section helps to identify the different menus mandatory steps and explains the execution flow.

3.2.5.1   Main
The main menu shall be shown to the user initially, it will provide few options as described in below picture.
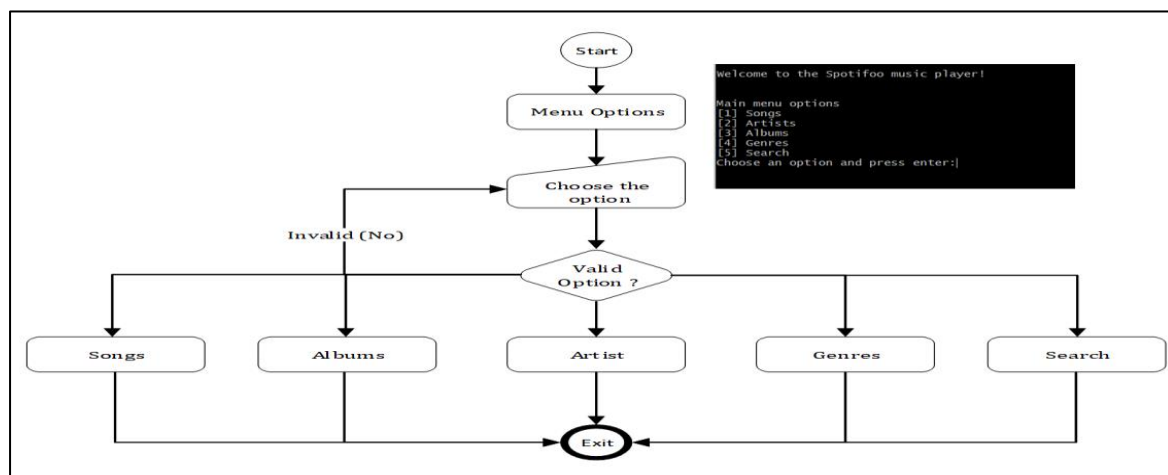

Figure 5 Main Menu

Here user has an option to choose the numbers between 1-5, once user enters the value in specified range that specific functionality shall be executed and moved into the next menu.

Error: Any input that entered the user other than 1-5 that shall be treated as an Invalid case and wait for the further user input.

The songs menu shall be shown to the user in different scenarios, i.e., from *Main Menu, Artists, Albums, Genre* and *Search* see below picture.

For example, if user has chosen the option "1" from *Main Menu* then all the songs shall be displayed into songs menu.
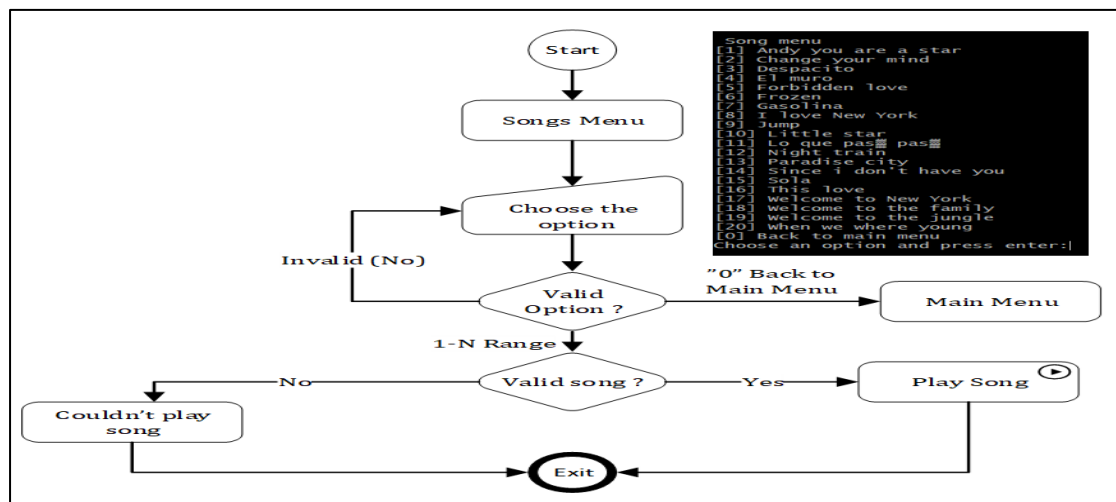

Figure 6 Songs Menu

Here user has an option to choose any of the song between [1-N], assume that there is more than 1 song and Option "0" take back to main menu.

Now, the user selected song shall be played in system default media player and song image is also opened in system default image viewer. Note that if the song is valid and it doesn't contain any image then default image is opened.

Error: Any input that entered the user other than "0" and songs range, that shall be treated as an Invalid case and wait for the further user input.

The artist menu shall be shown in the main menu. For Example, if the user enters an option of "2", then all the artists shall be displayed in the terminal.
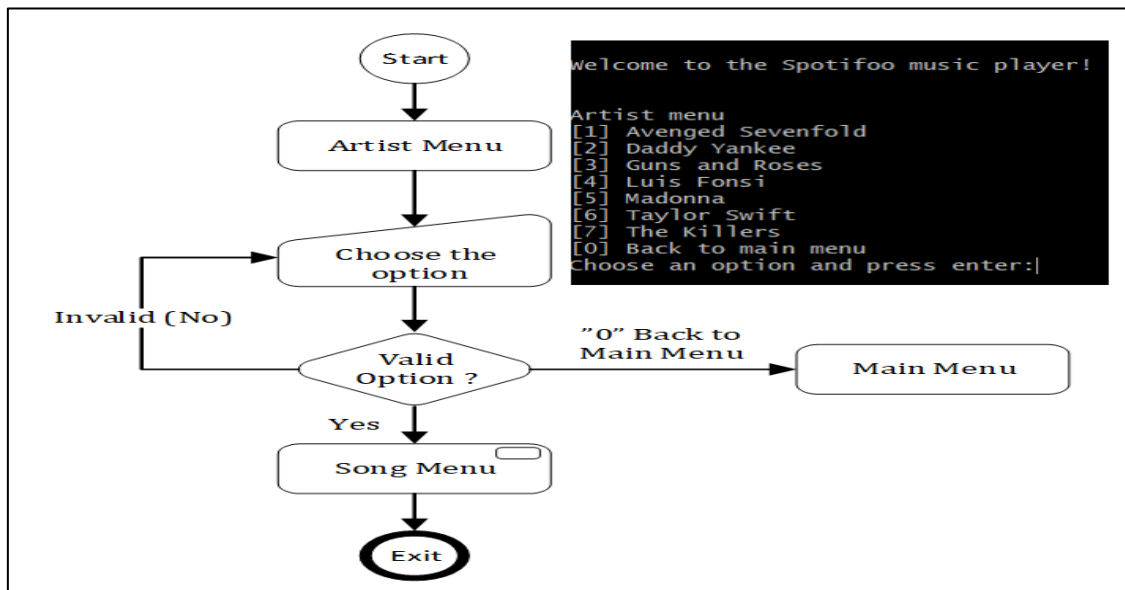

Figure 7 Artist menu

Here the user has an option to choose any of the artist between [1-N], assume that there is more than 1 artist and Option "0" take back to main menu.

Now, the user selected artist shall go the songs menu Ref [Songs]

Error: Any input that entered the user other than "0" and album range, that shall be treated as an Invalid case and wait for the further user input.

3.2.5.4   Album
The album menu shall be shown in the main menu. For Example, if the user enters an option of "3", then all the albums shall be displayed in the terminal.
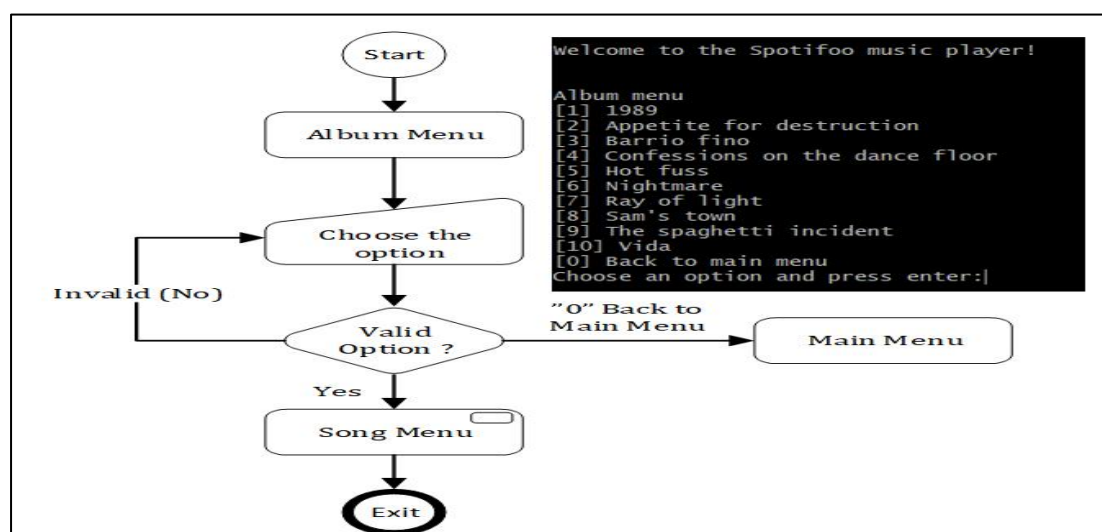

Figure 8 Album Menu

Here the user has an option to choose any of the album between [1-N], assume that there is more than 1 artist and Option "0" take back to main menu.

Now, the user selected album shall go the songs menu Ref [Songs]

Error: Any input that entered the user other than "0" and album range, that shall be treated as an Invalid case and wait for the further user input.

3.2.5.5   Genre

The Genre menu shall be shown in the main menu. For Example, if the user enters an option of "4", then all the Genre shall be displayed in the terminal.
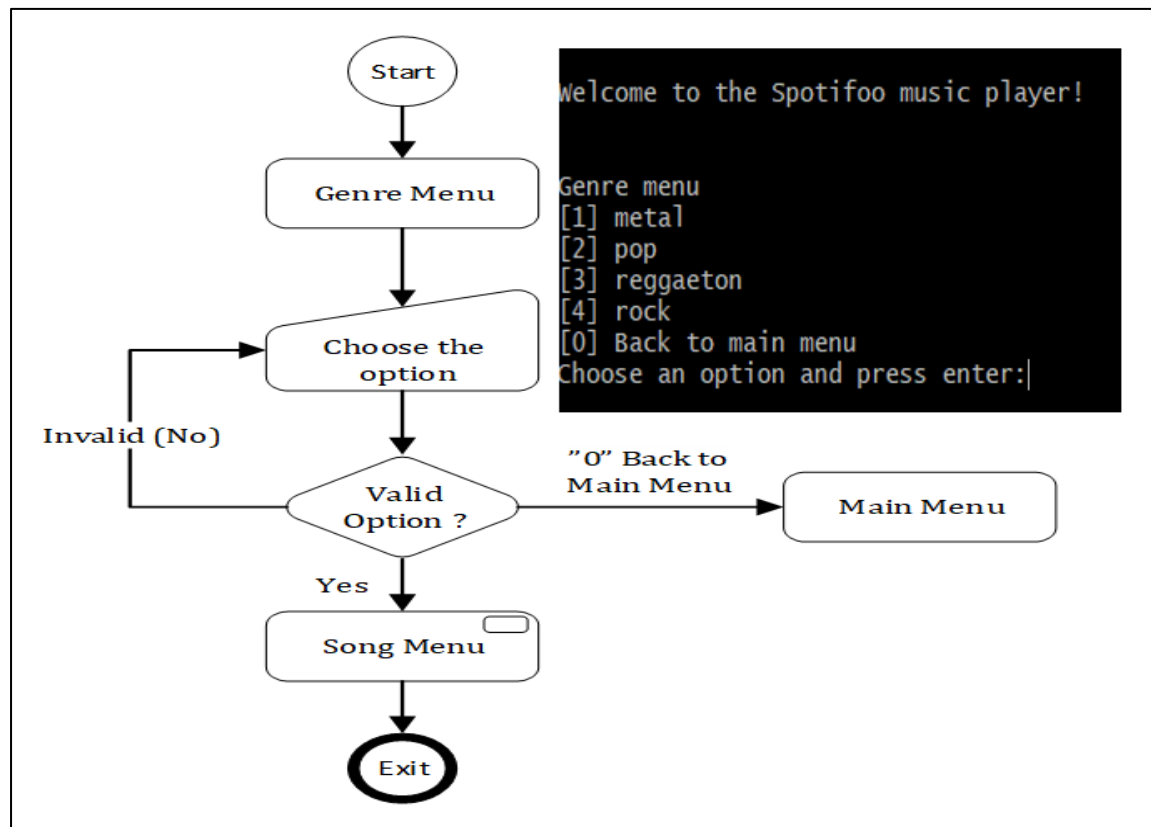

Figure 9 Genre Menu

Here the user has an option to choose any of the Genre between [1-N], assume that there is more than 1 genre and Option "0" take back to main menu.

Now, the user selected genre shall go the songs menu Ref [Songs]

Error: Any input that entered the user other than "0" and genre range, that shall be treated as an Invalid case and wait for the further user input.

The search option shall be shown in the main menu. For Example, if the user enters an option of "5", then the user shall be asked to search for a song.
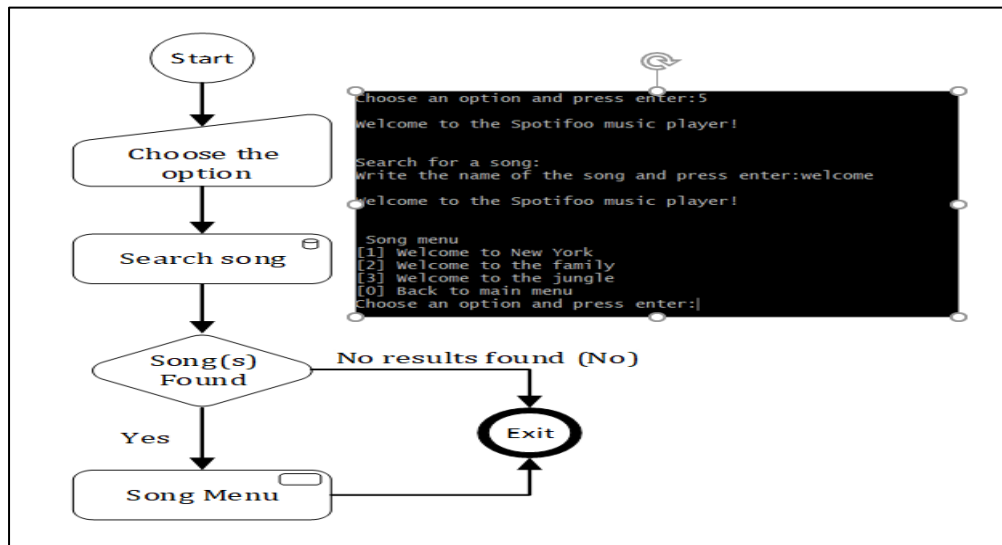

Figure 10 Search Menu

Here the user shall search for a song by its word and the corresponding songs that matches the word shall be displayed in the songs menu Ref [Songs].

Error: Any input that entered the user other than song name, shall be treated as an query and the user exits from the application.

3.2.6   Screens

3.2.6.1   Main Menu
This is the Main Menu of the Spotifoo Music App. When the user starts the application,

Error: This is the error message of the application. When the user enters invalid option, he gets the following output.

```
Choose an option and press enter:123
⚠Not a valid option
Choose an option and press enter:-1
⚠Not a valid option
Choose an option and press enter:ijuyhtrgedws
⚠Not a valid option
Choose an option and press enter:
⚠Not a valid option
Choose an option and press enter:0
```

3.2.6.2 Songs Menu

This is the output of the Songs Menu. If user has chosen the option "1" from *Main Menu* then all the songs shall be displayed into songs menu

```
Welcome to the Spotifoo music player!

 Song menu
[1] Andy you are a star
[2] Change your mind
[3] Despacito
[4] El muro
[5] Forbidden love
[6] Frozen
[7] Gasolina
[8] I love New York
[9] Jump
[10] Little star
[11] Lo que pasó pasó
[12] Night train
[13] Paradise city
[14] Since i don't have you
[15] Sola
[16] This love
[17] Welcome to New York
[18] Welcome to the family
[19] Welcome to the jungle
[20] When we where young
[0] Back to main menu
Choose an option and press enter:
```

3.2.6.3 Artist Menu

This is the output of the Artist Menu. If user has chosen the option "2" from *Main Menu* then all the artist shall be displayed into artist menu.

```
Welcome to the Spotifoo music player!


Artist menu
[1] Avenged Sevenfold
[2] Daddy Yankee
[3] Guns and Roses
[4] Luis Fonsi
[5] Madonna
[6] Taylor Swift
[7] The Killers
[0] Back to main menu
```

3.2.6.4 Album Menu

This is the output of the Album Menu. If user has chosen the option "3" from *Main Menu* then all the albums shall be displayed into album menu.

```
Welcome to the Spotifoo music player!


Album menu
[1]  1989
[2]  Appetite for destruction
[3]  Barrio fino
[4]  Confessions on the dance floor
[5]  Hot fuss
[6]  Nightmare
[7]  Ray of light
[8]  Sam's town
[9]  The spaghetti incident
[10] Vida
[0]  Back to main menu
```

3.2.6.5 Genre Menu

This is the output of the Genre Menu. If user has chosen the option "4" from *Main Menu* then all the genre shall be displayed into genre menu.

```
Welcome to the Spotifoo music player!


Genre menu
[1] metal
[2] pop
[3] reggaeton
[4] rock
[0] Back to main menu
Choose an option and press enter:1
```

This is the output of the Search menu. If user has chosen the option "5" from *Main Menu* then   user shall search for a song by its word and the corresponding songs that matches the word shall be displayed in the songs menu.

```
Welcome to the Spotifoo music player!


Search for a song:
Write the name of the song and press enter:welcome

Welcome to the Spotifoo music player!


 Song menu
[1] Welcome to New York
[2] Welcome to the family
[3] Welcome to the jungle
[0] Back to main menu
Choose an option and press enter:|
```