JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY

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विद्या तत्व ज्योतिसमः

DATA STRUCTURES LAB(CI371)

MINI PROJECT

XBEAT MUSIC PLAYER

SUBMITTED TO:

Dr. Bharat gupta

SUBMITTED BY:

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● Harshit Vijay	(21803015)

ACKNOWLEDGMENTS

It is a moment of great happiness and privilege for us to submit this Project Report. We have completed this project report under the supervision of Dr. Bharat Gupta.

We would like to express our gratitude towards all those people who have helped us in various ways for the successful completion of our project.

We are thankful to our teachers and colleagues for their valuable support and cooperation.

Contents

INTRODUCTION

This Project is all about exploring the currently existing data structures and different algorithms. For achieving this task, we have created a working prototype of an audio player.

Purpose of the project:

The purpose of our project is to mimic the backend processes which happen in any audio player.

Our project acts as a prototype of a audio player which would be acting as the backend for the inhouse Standalone Music Player (*codename* **XBEAT**)

Scope of the project:

This music player’s algorithm applies to more or less all the music players out there in the market. We also have incorporated additional functionalities like searching via name, filtering via rating and many more.

This music player applies to all the possible data algorithms that are developed to maintain the information in a database. This is extended to all the domains of the applications.

Role of Data Structures:

LINKED LIST -

We have used both singly and doubly Linked List for various operations like

- Inserting, updating and modifying songs within file (File Handling)
- Searching and Sorting of songs
- Creation of Playlists
- As a base of Queue

Doubly linked list provides the facility of easy traversal within the Linked List and at the same time Singly Linked list is used for storage optimisation.

BINARY SEARCH TREE (BST)

BST is used for filtering the songs based on their rating.

Reason of using BST:

> As it is the most efficient searching technique (self-sorted).

QUEUE

Queue is used for creating the Now playing list of songs.

Reason of using Queue is due to its FIFO principle (First In First Out).

> Usage: the first song which is added in the queue is the first song to be played.

Project Outcomes:

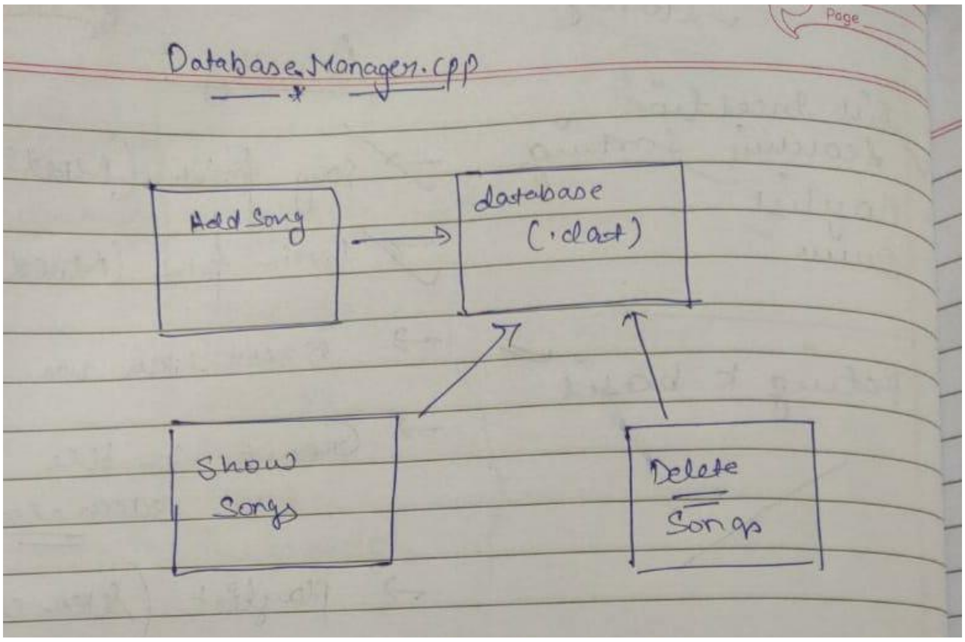
1. It has different songs in the program which all contain data about title, singer’s name, duration, rating, genre.

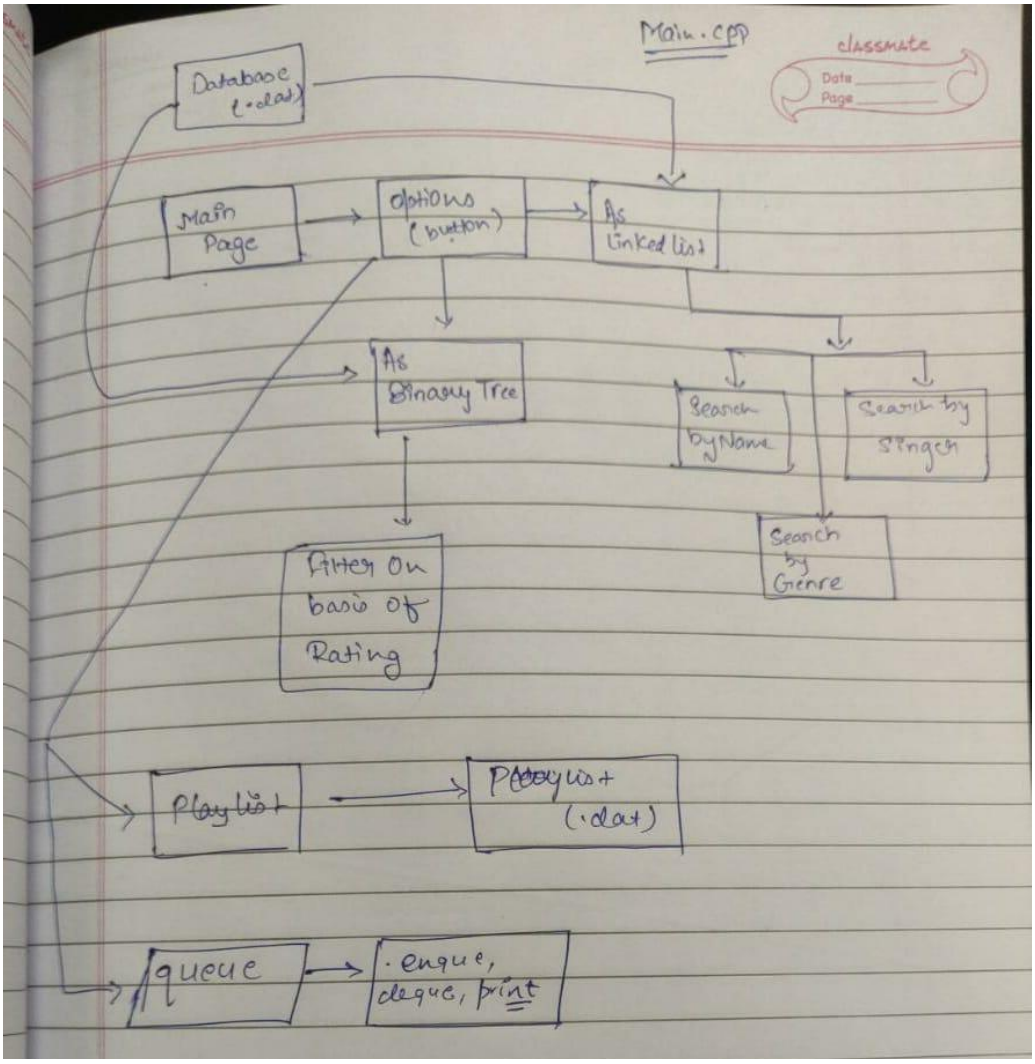
2. Users can search for specific songs by name, singers’ name and specific genre.

3. Users can modify the queue of songs which they are listening to.

4. Users can also make different playlist of their choice. And can listen to them with the help of a media player.

Flowchart:

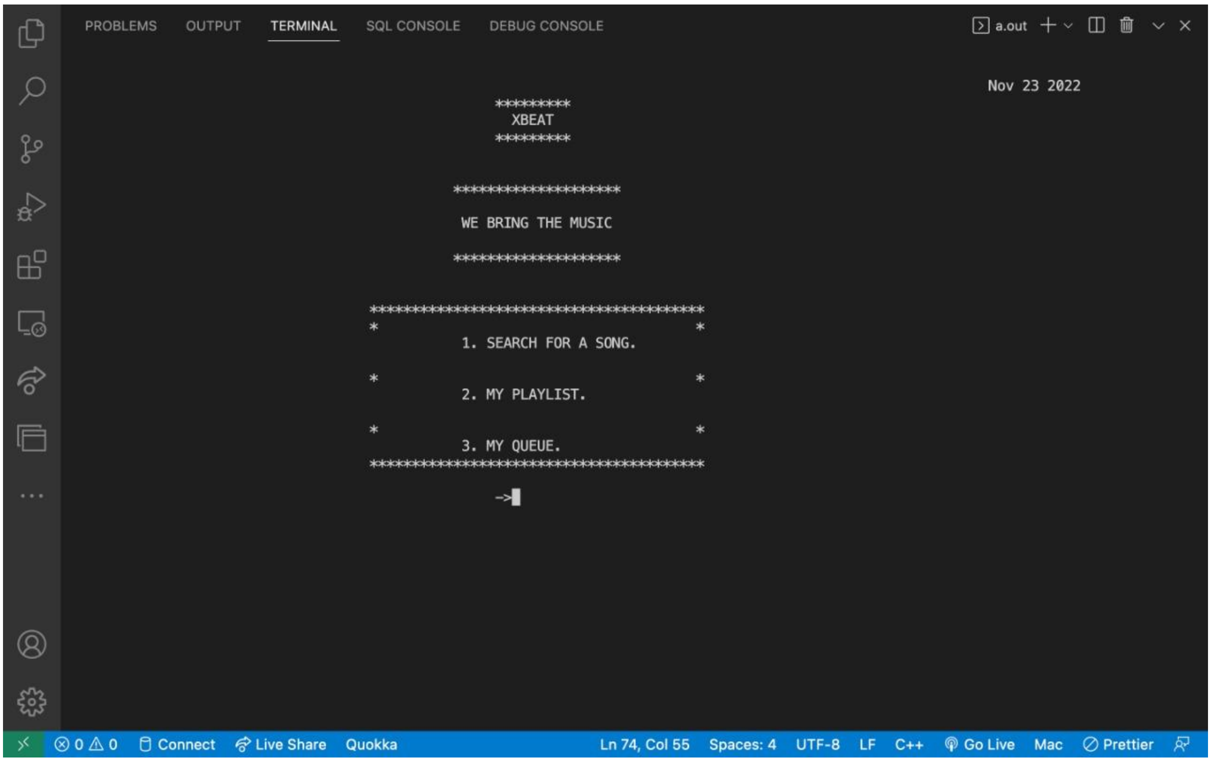

DatabaseManager.cpp
Add Song
database
(.dat)
Show
Songs
Delete
Songs


Main.cpp
Database
(.dat)
Main
Page
options
(button)
As
Linked list
As
Binary Tree
Search
by Name
Search by
Singer
Search
by
Genre
Filter On
basis of
Rating
Playlist
~~Playlist~~ Playlist
(.dat)
queue
.enque,
deque, print

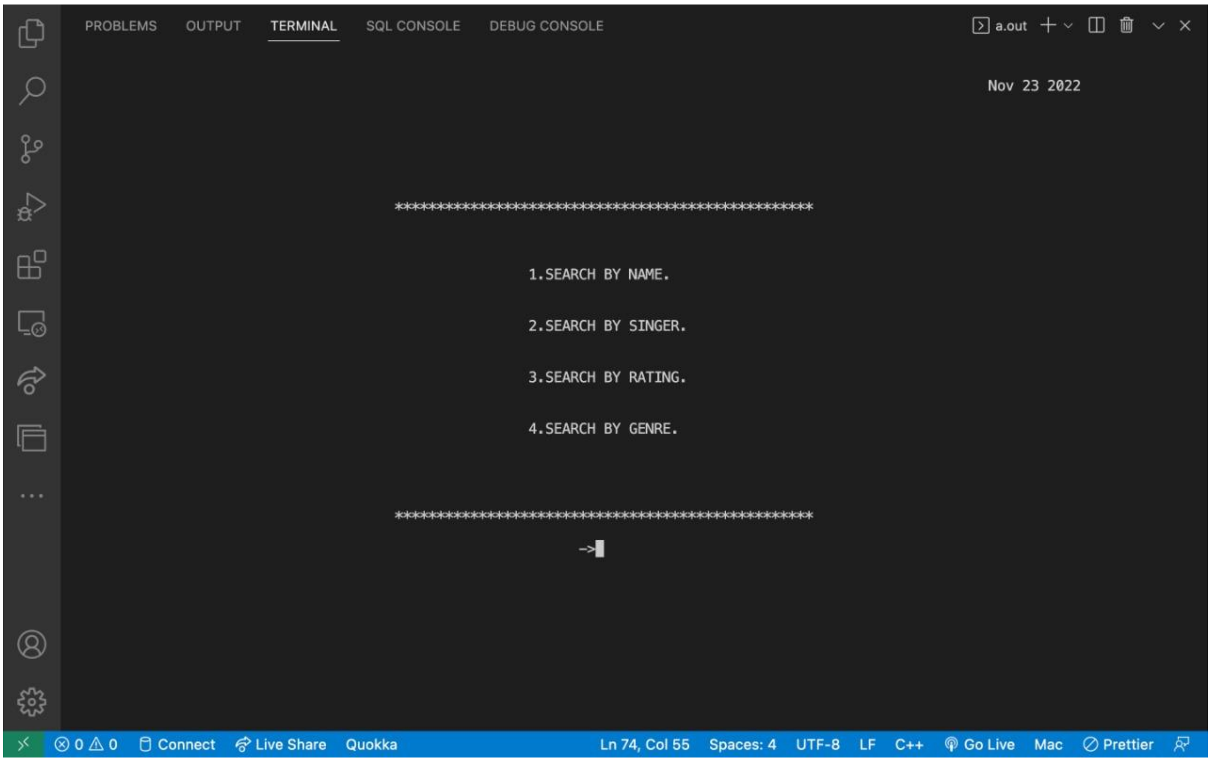
References

1. Spotify – Web Player (referred on 1st Nov. 2022)
2. C++ Dynamic Allocation of Arrays with Example (guru99.com) (referred on 17th Nov. 2022)
3. Linked List - W3School (referred on 17th Nov. 2022)
4. Circular Queue | Set 1 (Introduction and Array Implementation) -GeeksforGeeks (referred on 18th Nov. 2022)
5. Queue Data Structure - GeeksforGeeks (referred on 18th Nov. 2022)
6. Searching Algorithms - GeeksforGeeks (referred on 19th Nov. 2022)
7. Sorting Algorithm (programiz.com) (referred on 20th Nov. 2022)
8. Uncovering How the Spotify Algorithm Works | by Hucker Marius | Towards Data Science (referred on 21st Nov. 2022)

Screenshots :



```
                                                                         Nov 23 2022

               **********
                 XBEAT
               **********


          ********************

           WE BRING THE MUSIC

          ********************


****************************************
*                                      *
           1. SEARCH FOR A SONG.

*                                      *
           2. MY PLAYLIST.

*                                      *
           3. MY QUEUE.
****************************************
               ->
```



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                                                                      Nov 23 2022




**************************************************


                1.SEARCH BY NAME.

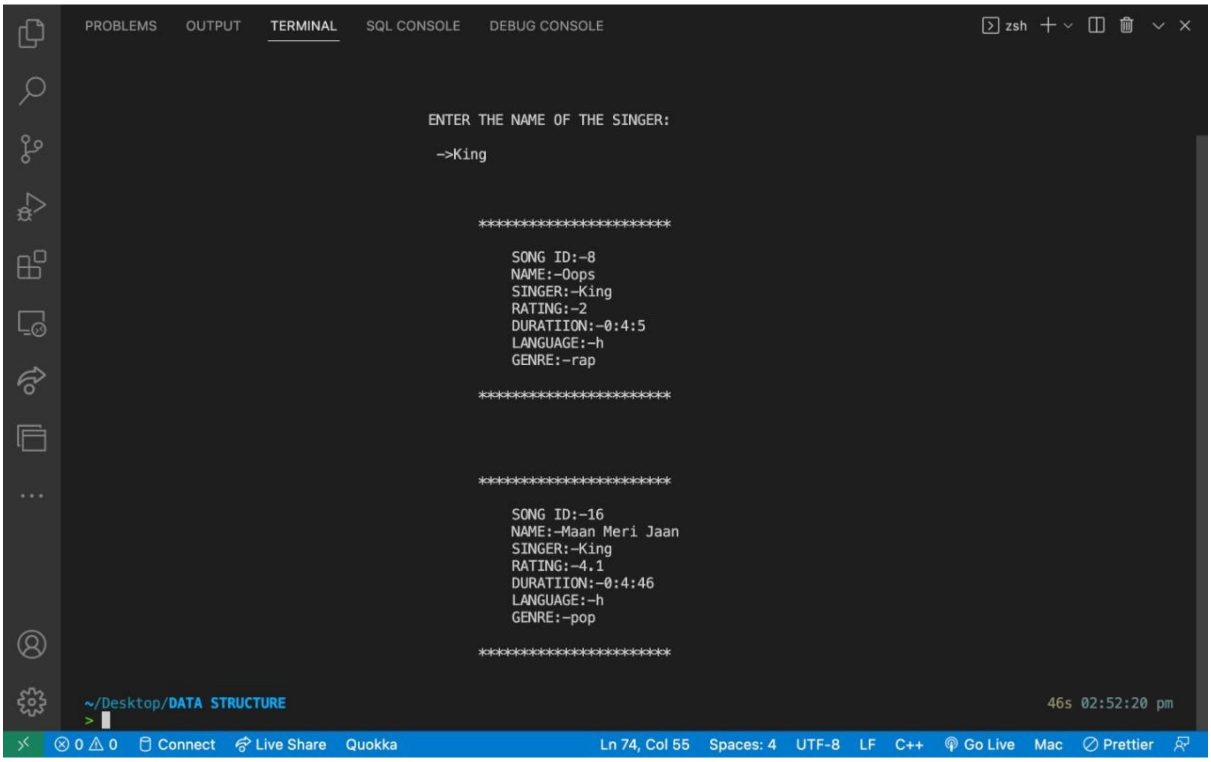
                2.SEARCH BY SINGER.

                3.SEARCH BY RATING.

                4.SEARCH BY GENRE.



**************************************************
                      ->
```



```
                                         ENTER THE NAME OF THE SINGER:

                                          ->King



                                               ***********************

                                                   SONG ID:-8
                                                   NAME:-Oops
                                                   SINGER:-King
                                                   RATING:-2
                                                   DURATIION:-0:4:5
                                                   LANGUAGE:-h
                                                   GENRE:-rap

                                               ***********************

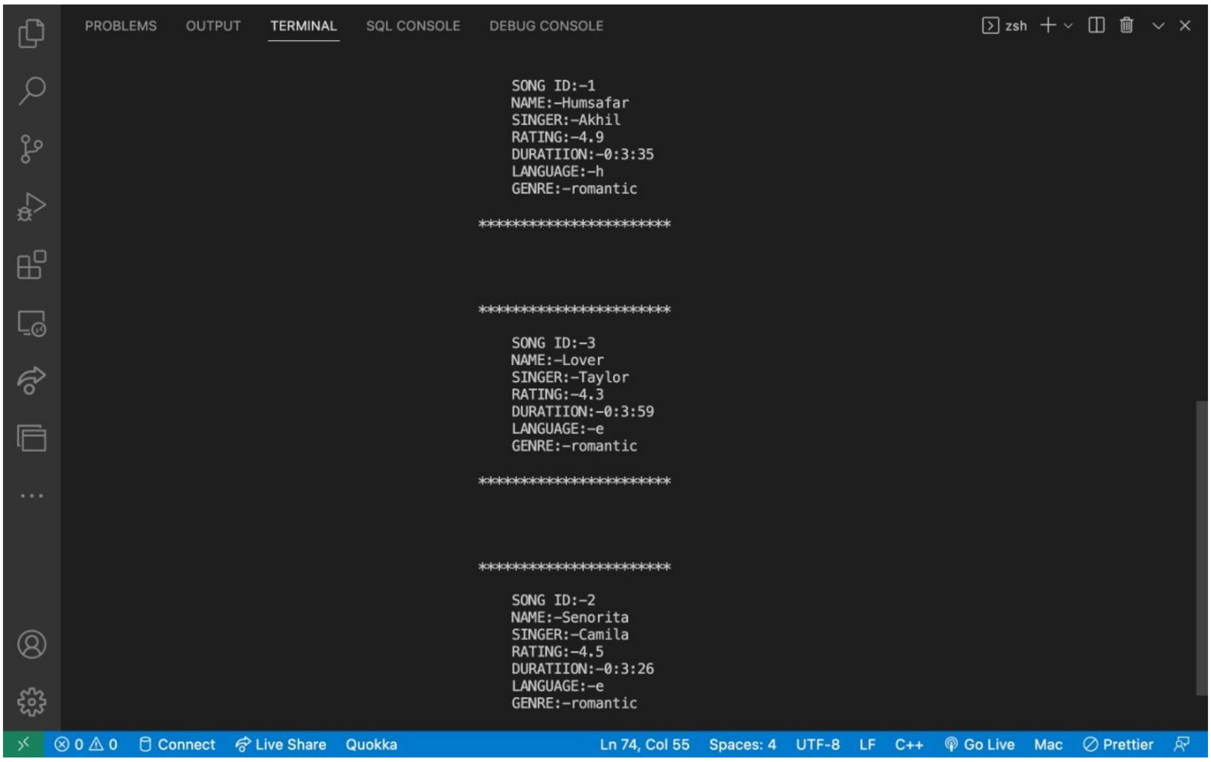



                                               ***********************

                                                   SONG ID:-16
                                                   NAME:-Maan Meri Jaan
                                                   SINGER:-King
                                                   RATING:-4.1
                                                   DURATIION:-0:4:46
                                                   LANGUAGE:-h
                                                   GENRE:-pop

                                               ***********************


~/Desktop/DATA STRUCTURE                                                                                  46s 02:52:20 pm
>
```



```
                                                   SONG ID:-1
                                                   NAME:-Humsafar
                                                   SINGER:-Akhil
                                                   RATING:-4.9
                                                   DURATIION:-0:3:35
                                                   LANGUAGE:-h
                                                   GENRE:-romantic

                                               ***********************




                                               ***********************

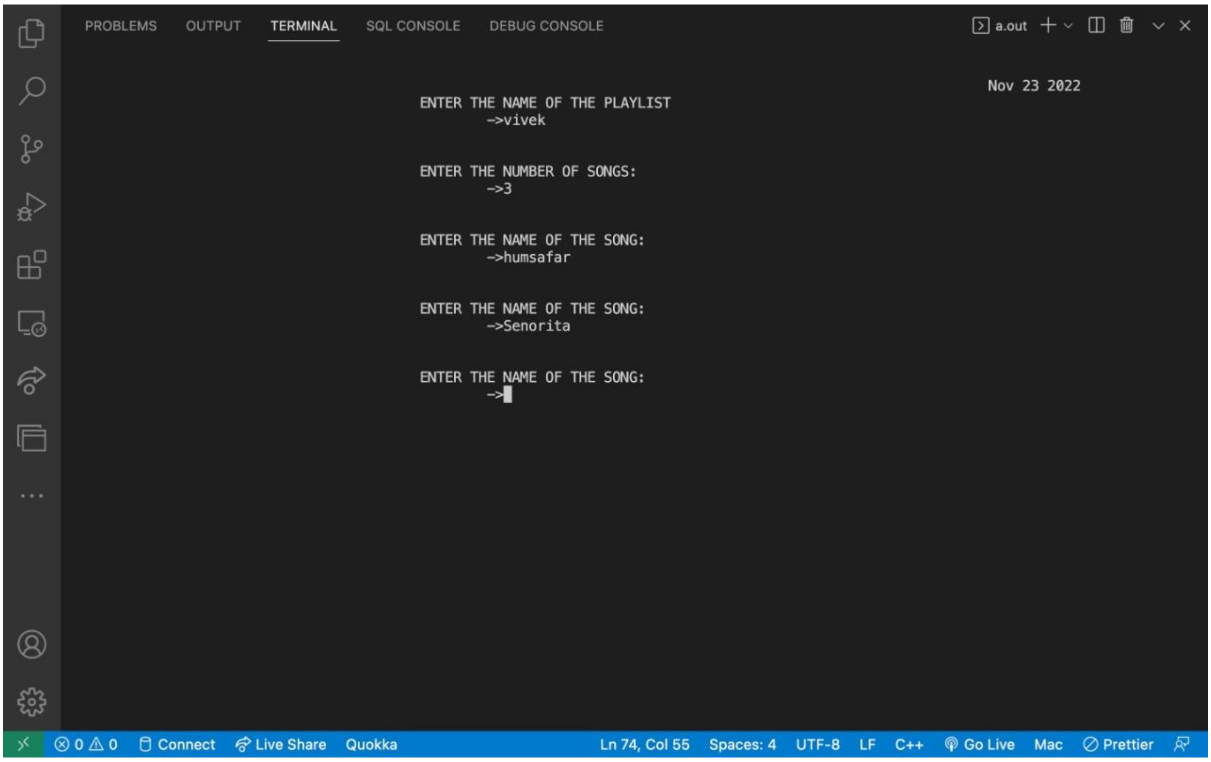
                                                   SONG ID:-3
                                                   NAME:-Lover
                                                   SINGER:-Taylor
                                                   RATING:-4.3
                                                   DURATIION:-0:3:59
                                                   LANGUAGE:-e
                                                   GENRE:-romantic

                                               ***********************




                                               ***********************

                                                   SONG ID:-2
                                                   NAME:-Senorita
                                                   SINGER:-Camila
                                                   RATING:-4.5
                                                   DURATIION:-0:3:26
                                                   LANGUAGE:-e
                                                   GENRE:-romantic
```



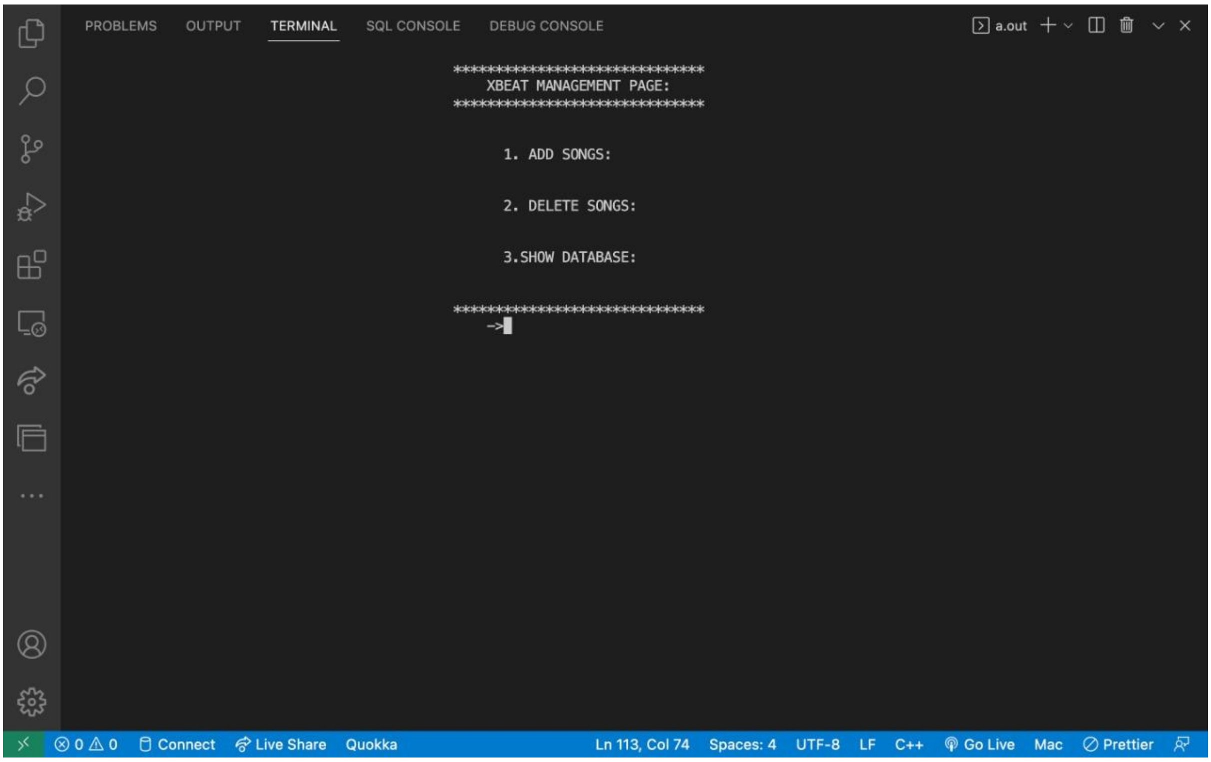
```
                                                                    Nov 23 2022
ENTER THE NAME OF THE PLAYLIST
        ->vivek


ENTER THE NUMBER OF SONGS:
        ->3


ENTER THE NAME OF THE SONG:
        ->humsafar


ENTER THE NAME OF THE SONG:
        ->Senorita


ENTER THE NAME OF THE SONG:
        ->
```



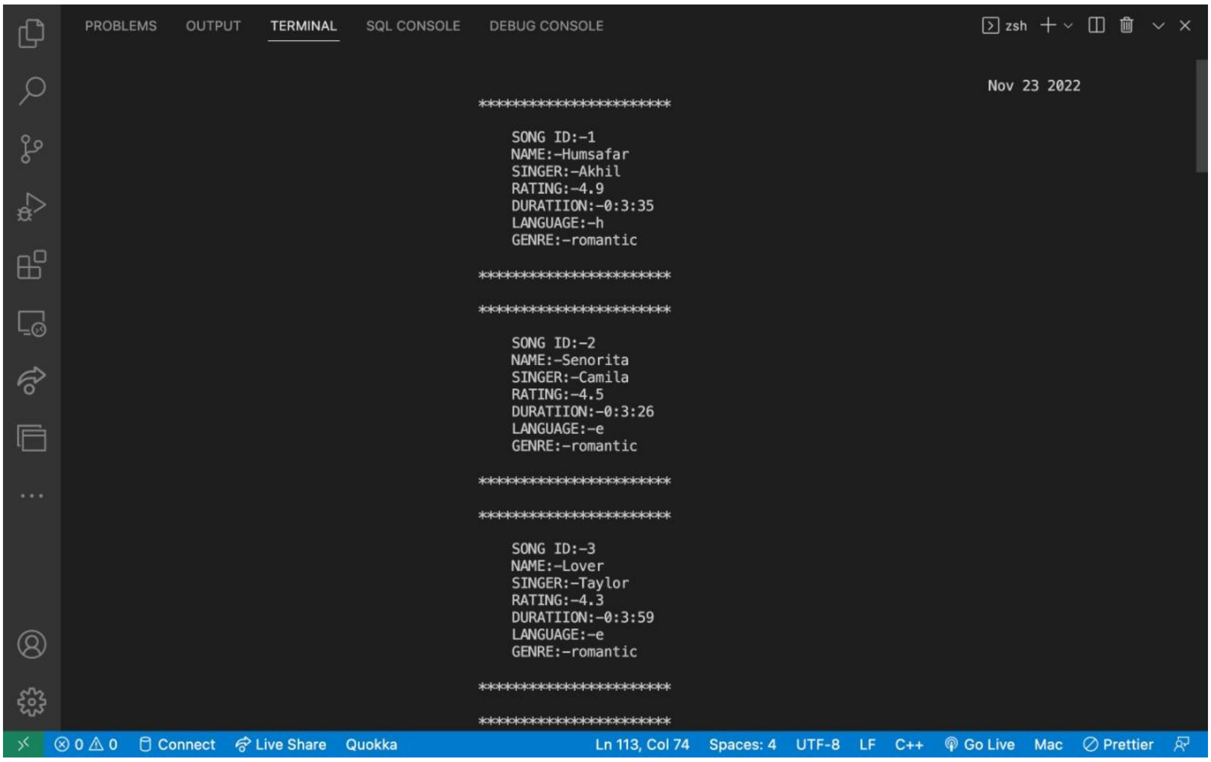
```
            ******************************
                XBEAT MANAGEMENT PAGE:
            ******************************


                  1. ADD SONGS:


                  2. DELETE SONGS:


                  3.SHOW DATABASE:


            ******************************
                ->
```



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                                                              Nov 23 2022
   ***********************

       SONG ID:-1
       NAME:-Humsafar
       SINGER:-Akhil
       RATING:-4.9
       DURATIION:-0:3:35
       LANGUAGE:-h
       GENRE:-romantic

   ***********************

   ***********************

       SONG ID:-2
       NAME:-Senorita
       SINGER:-Camila
       RATING:-4.5
       DURATIION:-0:3:26
       LANGUAGE:-e
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   ***********************

   ***********************

       SONG ID:-3
       NAME:-Lover
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   ***********************
```