C Programming Project

By – Shyla Seth

SAP ID- 590022990

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Music Playlist Generator

Course- *C programming*

Name- *Shyla Seth*

Roll No.- *590022990*

University- *University of Petroleum and Energy Studies*

Abstract

Music management is a crucial need in the digital age. This project showcases the design and use of a Music Playlist Generator with the C programming language. The application lets users add, delete, search, sort, and display songs effectively by using a doubly linked list data structure. File handling has been included to make sure data stays saved, allowing playlists to be saved and loaded between program runs. The project focuses on applying basic C programming concepts like structures, pointers, dynamic memory allocation, modular programming, and file input/output operations.

PROBLEM DEFINITION

Managing a collection of songs manually becomes difficult as the number of songs increases. Traditional methods lack efficient searching, deletion, and data persistence facilities.

The key problems addressed are:

- Organizing song details systematically
- Searching songs efficiently
- Deleting unwanted songs
- Saving playlist data permanently
- Maintaining data without data loss after program exit

This project aims to solve these problems using C programming techniques.

SYSTEM DESIGN

Data Structure Design~

A **doubly linked list** is used to store song records dynamically.

Each Song contains:

- Song ID
- Title
- Artist
- Album
- Duration (in seconds)
- Pointer to next song
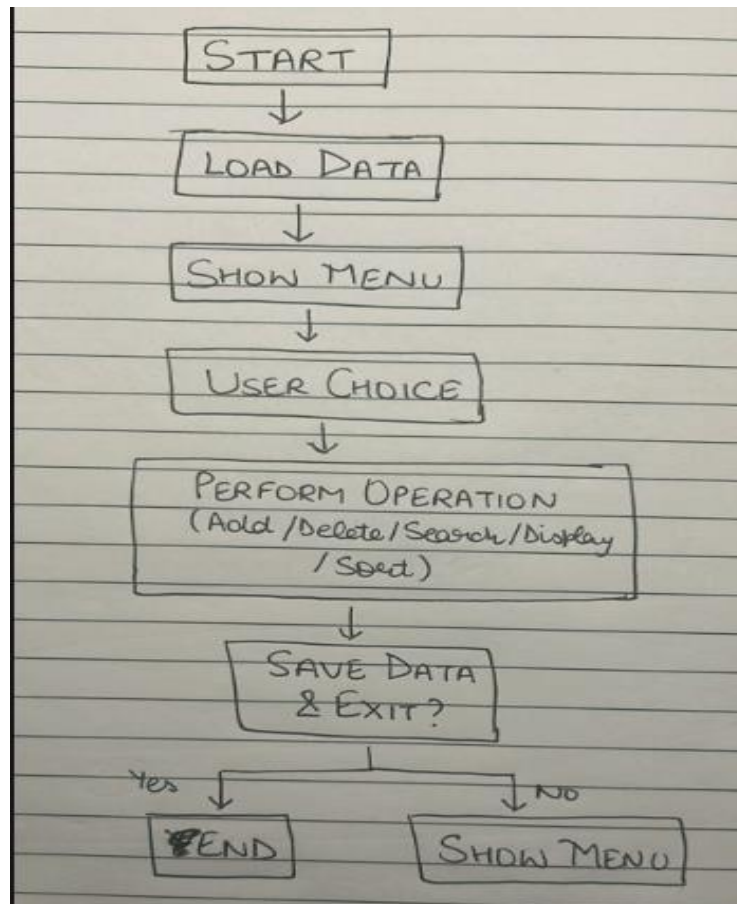- Pointer to previous song

This design allows efficient insertion, deletion, and traversal.

Algorithm~

Main Algorithm:

1. Start program

2. Load playlist from file

3. Display menu options

4. Accept user choice

5. Perform selected operation

6. Repeat until Exit

7. Save playlist to file

8. End program

Flowchart~

IMPLEMENTATION DETAILS

The project is divided into multiple files for modularity.

File Name	Description
main.c	Menu handling & program flow
playlist.c	Linked list operations
fileio.c	File save & load operations
utils.c	Helper functions
.h files	Function declarations

TESTING & RESULTS

Test Cases~

Test Case	Input	Expected Output	Result
• Add Song	Song Details	Song added	Pass
• Search Song	Song title	Song details	Pass
• Delete Song	Song ID	Song removed	Pass
• Sort	Playlist	Sorted list	Pass
• Save & Load	Restart program	Playlist restored	Pass

Output Screenshots~

1. Adding a song-

```
=== Music Playlist Generator ===
1. Add song
2. Delete song
3. Search song
4. Display all songs
5. Save & Exit
Choice: 1
Enter Title: Imagination
Enter Artist: Shawn Mendes
Enter Album: Handwritten
Enter Duration (seconds): 218
Song added with ID 1
```

2. Deleting a song-

```
=== Music Playlist Generator ===
1. Add song
2. Delete song (coming soon)
3. Search song (coming soon)
4. Display all songs
5. Save & Exit
Choice: 1
Enter Title: Higher
Enter Artist: Shawn Mendes
Enter Album: Wonder
Enter Duration (seconds): 160
Song added with ID 1

=== Music Playlist Generator ===
1. Add song
2. Delete song (coming soon)
3. Search song (coming soon)
4. Display all songs
5. Save & Exit
Choice: 2
Enter Song ID to delete: 1
Song deleted successfully.
```

3.   Searching for a song-

```
=== Music Playlist Generator ===
1. Add song
2. Delete song
3. Search song
4. Display all songs
5. Save & Exit
Choice: 3
Enter song title to search: Imagination
ID: 1 | Title: Imagination | Artist: Shawn Mendes | Album: Handwritten | Duration: 3:38
```

4.   Displaying all songs-

```
=== Music Playlist Generator ===
1. Add song
2. Delete song
3. Search song
4. Display all songs
5. Save & Exit
Choice: 4

ID    TITLE              ARTIST          ALBUM             DURATION
-----------------------------------------------------------------
1     Right where you left me Taylor Swift    Evermore          4:05
2     Back to me        The Rose        Dual          3:44
3     Back to you       Selena Gomez    13 Reasons why  3:27

=== Music Playlist Generator ===
1. Add song
2. Delete song
3. Search song
4. Display all songs
5. Save & Exit
Choice: 5
Saved and exiting. Bye!
```

Conclusion

The Music Playlist Generator project was successfully implemented using C programming. It efficiently manages song data using linked lists and file handling. All essential operations such as adding, deleting, searching, sorting, and saving songs were implemented successfully.

This project strengthened understanding of C programming concepts and demonstrated their real-world application.

Future Work

The project can be enhanced by~

- Adding graphical user interface (GUI)

- Integrating audio playback

- Implementing case-insensitive search

- Sorting by artist or duration

- Developing a mobile or web version

REFERENCES

1. Kernighan & Ritchie, *The C Programming Language*

2. GeeksforGeeks – C Linked Lists

3. Notes provided by Sir

THANKYOU

Project by- Shyla Seth

Sap Id- 590022990

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