

**Vanier College**  
**Computer Science Department**

**Programming Patterns**

**LAB 2**

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**Q1:** You are tasked with implementing a Singly Linked List to manage a playlist of songs. Each song has the following attributes:

- Song Name (String)
- Artist Name (String)
- Duration (Integer, in seconds)

Implement a menu-driven program with the following functionalities:

*Tasks:*

1. Create a Linked List:
  - Implement a Node class where each node represents a song.
  - Create a LinkedList class to manage the playlist.
2. Add a Song:
  - Write a function to add a song to the end of the playlist.
  - Prompt the user for song details.
3. Delete a Song:
  - Write a function to delete a song from the playlist by its name. If the song is not found, display an appropriate message.
4. Display the Playlist:
  - Write a function to traverse and display all songs in the playlist with their details in a user-friendly format.
5. Search for a Song:
  - Write a function to search for a song by its name or artist name and display its details if found.
6. Find the Total Duration:
  - Write a function to calculate and display the total duration of the playlist.
7. Exit the Program:
  - Exit the program when the user chooses.

*Sample Menu:*

1. Add a song
2. Delete a song
3. Display the playlist
4. Search for a song

5. Find total duration of the playlist

6. Exit

Enter your choice:

*Expected Output:*

*Sample Input:*

1. Add a song

Enter song name: Perfect

Enter artist name: Ed Sheeran

Enter duration (in seconds): 263

1. Add a song

Enter song name: Shape of You

Enter artist name: Ed Sheeran

Enter duration (in seconds): 234

3. Display the playlist

Sample Output:

Playlist:

1. Song Name: Perfect | Artist: Ed Sheeran | Duration: 263  
seconds

2. Song Name: Shape of You | Artist: Ed Sheeran | Duration: 234  
seconds

*Note:*

- Consider edge cases (e.g., adding to an empty list, deleting a non-existent song, etc.).
- Enhance the linked list by adding the ability to sort songs by duration or alphabetically.