🎯 Project Title:

Console-Based Music Player in Java Using OOP

📌 Objective:

Build a **menu-driven console application** in Java that simulates a simple music player using OOP concepts like Encapsulation, Abstraction, Inheritance, and Polymorphism. It allows users to manage a **library of songs**, **create playlists**, and **play/pause/stop** songs within playlists.

🔧 Core OOP Concepts Demonstrated

Concept	Usage
Encapsulation	Private fields and public getters/setters in classes like Song
Abstraction	Playable interface to abstract playback operations
Inheritance	Playlist implements Playable
Polymorphism	Interface methods overridden in Playlist
Collections	ArrayList used to manage songs and playlists dynamically

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🧱 Class Breakdown

✅ Song Class

- **Fields:** songId, title, artist, duration
- **Purpose:** Encapsulates a song entity
- **Key Methods:** Constructor, Getters/Setters, toString()

✅ Playable Interface

- **Methods:**
  - ○ void play(String title)
  - ○ void play(int songId)
  - ○ void pause(String title)

- o void pause(int songId)
- o void stop(String title)
- o void stop(int songId)
- **Purpose:** Abstract playback behavior for any class that implements it.

✅ Playlist Class (implements Playable)

- **Fields:** playlistId, playlistName, List<Song>
- **Purpose:** Represents a playlist of songs with playback control
- **Key Methods:**
  - o addSong(Song)
  - o removeSong(String/int)
  - o displaySongs()
  - o Implementations for play(), pause(), stop()

✅ MusicPlayer Class

- **Fields:** List<Song> allSongs, List<Playlist> playlists
- **Purpose:** Manages song library and playlists.
- **Key Methods:**
  - o addSong(Song)
  - o updateSong(String, Song)
  - o deleteSong(String)
  - o displayAllSongs()
  - o createPlaylist(String)
  - o addSongToPlaylist(String, Song)
  - o deletePlaylist(String)
  - o playPlaylist(String)
  - o getPlaylist(String)

- displayAllPlaylists()

🎮 Menu-Driven Application – Main Class

Here's how the menu system looks in the console:

markdown

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======== MUSIC PLAYER MENU ========

1. Add New Song

2. Update Existing Song

3. Delete Song

4. Display All Songs

5. Create New Playlist

6. Add Song to Playlist

7. Display All Playlists

8. Display Songs in Playlist

9. Play Song in Playlist

10. Pause Song in Playlist

11. Stop Song in Playlist

12. Exit

Enter your choice: