

## July 2025 CSE 108

### Online 1: B1+B2

Time: 45 min

Total Mark: 10

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You need to simulate a **Music Playlist Manager** using basic Object-Oriented Programming (OOP) concepts in C++. The system should allow a user to manage a list of songs, update song durations (e.g., for radio edits), and identify the longest track.

#### Tasks:

1. Create a class named **Song** with the following private member variables:
  - o **string title** – title of the song
  - o **string artist** – name of the artist/band
  - o **int duration** – duration of the song in seconds
2. Implement the following public member functions in the **Song** class:
  - o **void display()** – prints the details of the song.
  - o **Constructors:**
    - Default constructor.
    - Parameterized constructor: **Song(string title, string artist, int duration)**
3. Create a class named **Playlist** to manage a collection of **Song** objects.
4. Include private member variables:
  - o **Song\* songs** – dynamically allocated array of **Song** objects.
  - o **int numSongs** – current number of songs in the playlist.
  - o **int capacity** – maximum number of songs the playlist can hold.
5. Include public member functions to:
  - o **Add a song: void addSong(Song s)**
    - Adds a new song to the playlist.
  - o **Update duration: void updateDuration(string title, int newDuration)**
    - Updates the duration of a song found by its title.
  - o **Get longest song: Song getLongestSong()**
    - Returns the song object with the highest duration.
  - o **void showList()** – displays all songs in the playlist.
6. Implement the following for the **Playlist** class:
  - o Parameterized constructor: **Playlist(int capacity)**
  - o **Copy constructor:** Must perform a **deep copy**.
  - o **Destructor:** Must free dynamically allocated memory.

#### Sample main() Function:

```
int main() {
```

```

Playlist p1(4);
Song s1("Oniket Prantor", "Artcell", 982);
Song s2("Obak Bhalobasha", "Warfaze", 354);
Song s3("Boshonto Batashe", "James", 285);

p1.addSong(s1);
p1.addSong(s2);
p1.addSong(s3);

cout << "Playlist 1 (Original):\n";
p1.showList();

// Test Copy Constructor (Deep Copy)
Playlist p2 = p1;

// Modify p2: Radio Edit for Oniket Prantor, and add new song
p2.updateDuration("Oniket Prantor", 300);
p2.addSong(Song("Alo", "Tahsan", 250));

cout << "\nPlaylist 1 Longest Song:\n";
p1.getLongestSong().display(); // Should remain Oniket Prantor (982s)

cout << "\nPlaylist 2 (Modified):\n";
p2.showList();

cout << "\nPlaylist 2 Longest Song:\n";
p2.getLongestSong().display(); // Should now be Obak Bhalobasha (354s)

return 0;
}

```

### **Expected Output:**

Playlist 1 (Original):  
 Title: Oniket Prantor, Artist: Artcell, Duration: 982s  
 Title: Obak Bhalobasha, Artist: Warfaze, Duration: 354s  
 Title: Boshonto Batashe, Artist: James, Duration: 285s

Playlist 1 Longest Song:  
 Title: Oniket Prantor, Artist: Artcell, Duration: 982s

Playlist 2 (Modified):  
 Title: Oniket Prantor, Artist: Artcell, Duration: 300s

Title: Obak Bhalobasha, Artist: Warfaze, Duration: 354s

Title: Boshonto Batashe, Artist: James, Duration: 285s

Title: Alo, Artist: Tahsan, Duration: 250s

Playlist 2 Longest Song:

Title: Obak Bhalobasha, Artist: Warfaze, Duration: 354s