Project 0 Design Document

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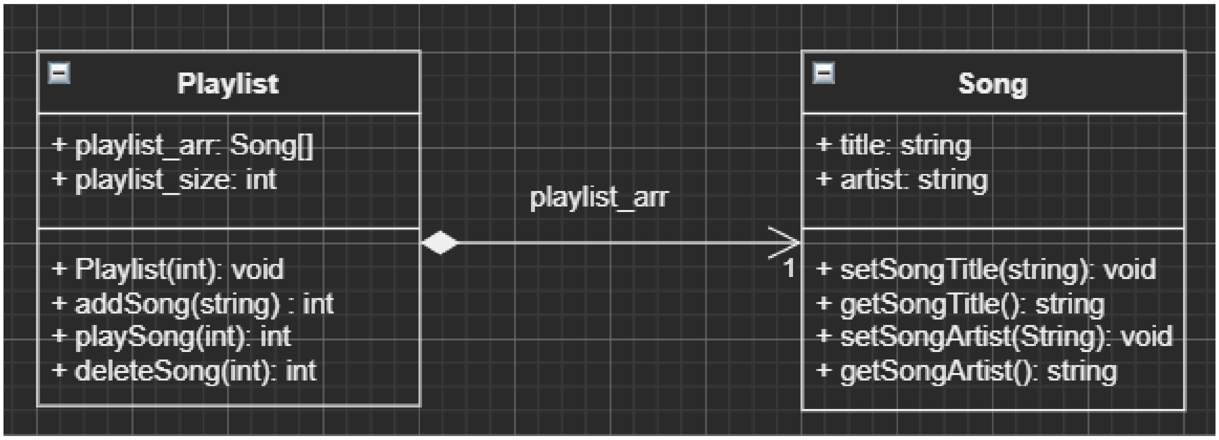
1. Overview of classes

Two classes are implemented in this design, one for the playlist and the other for the entries in the list (songs). Class ‘Song’ stores the title and artist of a song, with functions provided to set and get these data. Class ‘Playlist’ is an array of ‘Song’, with functions to add, delete, and “play” songs at certain position.

2. UML class diagram



3. Design decisions:

<u>For Playlist class:</u>

An integer is needed to construct the playlist array with a specified size; in the destructor the array also needs to be deleted. Besides, since the size of a playlist cannot change once the playlist is initialized, “const” is used on playlist_size.

<u>For Song class:</u>

It has two strings, and the methods are used to set and get these parameters only.

4. Test strategy:

For adding songs, it should not add a song if:

The array is full;

The song is already in the list (the title and artist are identical).

For playing song at position n, it should not play a song if position n is empty or n > playlist size.

For deleting song at position n, it should not delete a song if position n is empty or n> playlist size.

5. Performance analysis:

addSong(title, artist): O(n) since it checks every other song to make sure there is no duplication.

playSong(n): O(1) since it can access the target in an array in O(1) time with index

deleteSong(n): O(n) since it needs to move every song below position n up.