

Mini Project 2: Playlist

(85 pts, Due Thursday, Oct. 15)

Note: you may work with a partner or you may work alone. If you choose to work with a partner, make sure:

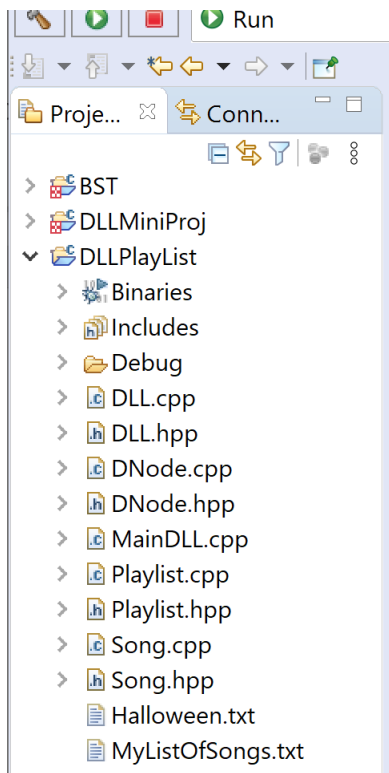
- you both turn in the project
- you include both names on the project.
- Equally, note your partner's name in canvas.

Please be aware that if your partner flakes on you, you are still responsible for completing the mini project and turning it in on time.

Time: This project may take about 10 hours, and should be worked on in a spread-out manner, as opposed to one sitting.

This miniproject is closely tied to week 5 videos and ppts on my web site (<https://www.eecis.udel.edu/~yarringt/CISC220/>)

Note 2: I have included 2 songlist text files. It is a lot easier to work on this code if you are reading the songs in from a text file rather than having to type each one in every time. To make it so your code is able to read from the text files, place those text files in the project folder you've created. If you have a src or a binary folder inside the project folder, do not place the text files inside there. Place them inside the folder that holds your project (so, for instance, I created a project folder called DLLPlaylist. Inside are the following files:



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(5 pt) void push(string t, string a, int m, int s);	3
(6 pt) void printList();	3
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(5 pt) Song *pop();	3
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(10 pt) void moveDown(string t);	4
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Overview:

For this lab, you will be writing methods for a doubly linked list, to be used in a playlist class. For a playlist, we often add, remove, and rearrange our playlists, not to mention make new ones. So a doubly linked list is a good choice because of the sheer amount of resizing!

I am giving you:

For this project, I am giving you:

- the main function
- the class declaration and definition for a Song object (which will be your data type in the nodes in your linked list),
- The class declaration and definition for the playlist (which has as a field the doubly linked list)
- The class declaration for the DNode class
- The class declaration for the DLL (the doubly linked list class)
- The constructor definitions for the DLL class

Please download the zipped file from my website (under labs/hwks/projects) with this code in it!

Your job will be to:

(5 pt) Write the class constructor definitions for the DNode class
(this will be short), and

Write the following method definitions for the DLL class:

(5 pt) `void push(string t, string a, int m, int s);`

This pushes a new node onto the end of the list. If there are no nodes in the list, it creates the first node and adds it. Otherwise it places a new node onto the end of the list. `t` is the song's title, `a` is the song's artist, `m` is the number of minutes the song runs for, and `s` is the number of seconds the song runs for

For testing: When my `readList` method in `Playlist.hpp` is called, it continuously calls the list's `push` method. So if this method reads in the list, and then print it out successfully, that is sufficient for testing. Although for your purposes, it will be notably easier to test once you've written `printList()` (explained below).

(6 pt) `void printList();`

This method should print out the list. Note that I have included a method for printing out each song object in the song class definitions, called `printSong()`. If you call that, the songs will be printed out in the format you see in the output

For testing: after every action you take, `printList` is called from the `Playlist` method definitions. Thus this will be tested automatically as we (and you) run the code.

(10 pt) `int remove(string t);`

This method finds the song with the title `s` and removes the node that holds that song from the list. I have this method print the line,

Removing: songtitle.....songmin:songsec

In other words, I have it print the song it is removing.

(Note: if the song is the data in the last node in the list, this method calls the `pop` method (as described below).

For testing: We will use option 2 in the playlist with 4 different songs including the first song, a random song (chosen in the middle somewhere), and the last song twice.

(5 pt) `Song *pop();`

This pops the last node off the list. If there is only one node on the list, it resets first and last to NULL and the `numSongs` field to 0. It returns a song object.

(Honestly, I barely used `pop` in this project. I had it called when I removed the last node from the list using a special case in my `remove` method. I am having you write it because it is just so fundamental to linked lists that I would be remiss as a teacher if I didn't have you write this).

For testing: I am happy with your calling it successfully from your `remove` method.

(10 pt) `void moveUp(string t);`

This method moves a song up one in the playlist. For instance, if you had the following:

Punching in a Dream, The Naked And Famous.....3:58
Harder To Breathe, Maroon 5.....2:52
Where the Rivers Flow, Sons of Maria.....3:03

Still Not a Player, Big Pun Joe.....3:56
Train, Brick+Mortar.....3:05

And the song was “Still Not a Player”, the result would be:

Punching in a Dream, The Naked And Famous.....3:58
Harder To Breather, Maroon 5.....2:52
Still Not a Player, Big Pun Joe.....3:56
Where the Rivers Flow, Sons of Maria.....3:03
Train, Brick+Mortar.....3:05

If you move the first song up, it will be moved to the end of the list as follows:

Punching in a Dream, The Naked And Famous.....3:58
Harder To Breather, Maroon 5.....2:52
Still Not a Player, Big Pun Joe.....3:56
Where the Rivers Flow, Sons of Maria.....3:03
Train, Brick+Mortar.....3:05

Moving “Punching in a Dream” up one would result in:

Harder To Breather, Maroon 5.....2:52
Still Not a Player, Big Pun Joe.....3:56
Where the Rivers Flow, Sons of Maria.....3:03
Train, Brick+Mortar.....3:05
Punching in a Dream, The Naked And Famous.....3:58

For testing: We will run 4 tests, including moving the last song up, the first song up twice, and a random middle song of our choice!

(10 pt) void moveDown(string t);

This method moves a song down one in the playlist. For instance, if you had the following:

Punching in a Dream, The Naked And Famous.....3:58
Harder To Breather, Maroon 5.....2:52
Where the Rivers Flow, Sons of Maria.....3:03
Still Not a Player, Big Pun Joe.....3:56
Train, Brick+Mortar.....3:05

And the song was “Harder To Breather”, the result would be:

Punching in a Dream, The Naked And Famous.....3:58
Where the Rivers Flow, Sons of Maria.....3:03
Harder To Breather, Maroon 5.....2:52
Still Not a Player, Big Pun Joe.....3:56
Train, Brick+Mortar.....3:05

If you move the last song (“Train”)down, it will be moved to the beginning of the list as follows:

Train, Brick+Mortar.....3:05
Punching in a Dream, The Naked And Famous.....3:58
Where the Rivers Flow, Sons of Maria.....3:03
Harder To Breather, Maroon 5.....2:52
Still Not a Player, Big Pun Joe.....3:56

For testing: We will run 4 tests, including moving the first song down, the last song down twice, and a random middle song of our choice down!

(18 pts) void makeRandom();

This method randomly shuffles the songs so that they are in a different, random order.

For testing: Randomly shuffle the list twice using the option 5 in the Playlist interface (This option automatically calls the printList method for the list, so you can see your randomly ordered list)

(7 pts) void listDuration(int *tm, int *ts);

This method traverses the list and adds up the minutes and seconds of each song to determine the total duration of the list (i.e., all your songs in the playlist). Note that it uses call by pointer to update the minutes and the seconds for outside of the method.

For Testing: We will run this using option 7 in the Playlist interface, so check to confirm it is correct. When you create a brand new playlist (described below) you should run this again and double-check the time to make sure it is correct.

(7 pts) Creating a brand new list (~DLL):

If you write the destructor for the linked list correctly, this will work. So this involves writing the destructor for the linked list, deleting all the nodes in the linked list and resetting the linked list's fields.

For Testing: We will be using Option 6 in the Playlist's interface. For that, the destructor will be called and you will be asked to enter the name of a new text file with a new set of songs to be read into a list.

Note: after you do this, you should use the option 7 to get a new list duration, and double-check it.

That's it!

(2 pts) To turn in!

A Zipped file that includes:

1. Song.hpp
2. Song.cpp
3. MainDLL.cpp
4. Playlist.cpp
5. Playlist.hpp
6. DNode.hpp
7. DNode.cpp (with your code)
8. DLL.hpp
9. DLL.cpp(with your code)
10. A screenshot of your output
11. The two text files you used for testing.

/*****

Output:

I am not including all of my output because that would just be too long. But here is a partial example of my output:

Monster Mash, Boris Pickett, 3:11
Ghostbusters, Pentatonix, 3:59
Freaks Come Out at Night, Whodini, 4:43
A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince, 4:58
Stranger Things, Kyle Dixon and Michael Stein, 1:07
Cannibal, Kesha, 3:14
Haunted, Beyonce, 6:09
Black Magic Woman, Santana, 3:16
Werewolves of London, Warren Zevon, 3:29
Halloween Theme, John Carpenter, 2:55
*****DONE READING*****

Monster Mash, Boris Pickett.....3:11
Ghostbusters, Pentatonix.....3:59
Freaks Come Out at Night, Whodini.....4:43
A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58
Stranger Things, Kyle Dixon and Michael Stein.....1:07
Cannibal, Kesha.....3:14
Haunted, Beyonce.....6:09
Black Magic Woman, Santana.....3:16
Werewolves of London, Warren Zevon.....3:29
Halloween Theme, John Carpenter.....2:55

What do you want to do?
Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

1

Adding a song:

Enter the song's info as follows: title, artist(s), min:sec

Ghost in the Machine, The Goblins, 3:55

Monster Mash, Boris Pickett.....3:11

Ghostbusters, Pentatonix.....3:59

Freaks Come Out at Night, Whodini.....4:43

A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58

Stranger Things, Kyle Dixon and Michael Stein.....1:07

Cannibal, Kesha.....3:14

Haunted, Beyonce.....6:09

Black Magic Woman, Santana.....3:16

Werewolves of London, Warren Zevon.....3:29

Halloween Theme, John Carpenter.....2:55

Ghost in the Machine, The Goblins.....3:55

What do you want to do?
Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list

- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

2

Removing a song:

Enter the title of the song you wish to remove

Cannibal

Removing: Cannibal, Kesha.....3:14
Monster Mash, Boris Pickett.....3:11
Ghostbusters, Pentatonix.....3:59
Freaks Come Out at Night, Whodini.....4:43
A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58
Stranger Things, Kyle Dixon and Michael Stein.....1:07
Haunted, Beyonce.....6:09
Black Magic Woman, Santana.....3:16
Werewolves of London, Warren Zevon.....3:29
Halloween Theme, John Carpenter.....2:55
Ghost in the Machine, The Goblins.....3:55

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

2

Removing a song:

Enter the title of the song you wish to remove

Ghost in the Machine

Removing: Ghost in the Machine, The Goblins.....3:55
Monster Mash, Boris Pickett.....3:11
Ghostbusters, Pentatonix.....3:59
Freaks Come Out at Night, Whodini.....4:43
A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58
Stranger Things, Kyle Dixon and Michael Stein.....1:07
Haunted, Beyonce.....6:09
Black Magic Woman, Santana.....3:16
Werewolves of London, Warren Zevon.....3:29
Halloween Theme, John Carpenter.....2:55

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration

8 for exit

3

Moving a Song Up:

Enter the title of the song you wish to move up in the list:

Black Magic Woman

Monster Mash, Boris Pickett.....3:11

Ghostbusters, Pentatonix.....3:59

Freaks Come Out at Night, Whodini.....4:43

A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58

Stranger Things, Kyle Dixon and Michael Stein.....1:07

Black Magic Woman, Santana.....3:16

Haunted, Beyonce.....6:09

Werewolves of London, Warren Zevon.....3:29

Halloween Theme, John Carpenter.....2:55

What do you want to do?

Enter:

1 for adding song

2 for removing a song

3 for moving a song up in the list

4 for moving a song down in the list

5 for randomly shuffling the list

6 for creating a brand new list

7 for getting the playlist's time duration

8 for exit

3

Moving a Song Up:

Enter the title of the song you wish to move up in the list:

Monster Mash

Ghostbusters, Pentatonix.....3:59

Freaks Come Out at Night, Whodini.....4:43

A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58

Stranger Things, Kyle Dixon and Michael Stein.....1:07

Black Magic Woman, Santana.....3:16

Haunted, Beyonce.....6:09

Werewolves of London, Warren Zevon.....3:29

Halloween Theme, John Carpenter.....2:55

Monster Mash, Boris Pickett.....3:11

What do you want to do?

Enter:

1 for adding song

2 for removing a song

3 for moving a song up in the list

4 for moving a song down in the list

5 for randomly shuffling the list

6 for creating a brand new list

7 for getting the playlist's time duration

8 for exit

4

Moving a Song Down:

Enter the title of the song you wish to move down in the list:

Monster Mash

Monster Mash, Boris Pickett.....3:11

Ghostbusters, Pentatonix.....3:59

Freaks Come Out at Night, Whodini.....4:43
A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58
Stranger Things, Kyle Dixon and Michael Stein.....1:07
Black Magic Woman, Santana.....3:16
Haunted, Beyonce.....6:09
Werewolves of London, Warren Zevon.....3:29
Halloween Theme, John Carpenter.....2:55

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

5

In 0

In 0

In 0

In 0

Halloween Theme, John Carpenter.....2:55

A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58

Black Magic Woman, Santana.....3:16

Stranger Things, Kyle Dixon and Michael Stein.....1:07

Freaks Come Out at Night, Whodini.....4:43

Monster Mash, Boris Pickett.....3:11

Ghostbusters, Pentatonix.....3:59

Haunted, Beyonce.....6:09

Werewolves of London, Warren Zevon.....3:29

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

5

In 0

In 0

In 0

Ghostbusters, Pentatonix.....3:59

Haunted, Beyonce.....6:09

Werewolves of London, Warren Zevon.....3:29

Freaks Come Out at Night, Whodini.....4:43

A Nightmare on My Street, DJ Jazzy Jeff & The Fresh Prince.....4:58

Stranger Things, Kyle Dixon and Michael Stein.....1:07

Halloween Theme, John Carpenter.....2:55

Black Magic Woman, Santana.....3:16

Monster Mash, Boris Pickett.....3:11

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

7

The total playlist time is 33:47

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

6

Enter the name of the list you wish to enter:

MyListOfSongs.txt

Reaper, Sia, 3:39

Good Life, OneRepublic, 4:13

I Can't Wait, Nu Shooz, 5:26

The King of Wishful Thinking, Go West, 4:01

i, Kendrick Lamar, 3:52

I Wanna Get Better, Bleachers, 3:24

Be Fine, Madeon, 3:28

Ain't No Easy Way, Black Rebel Motorcycle Club, 2:36

Antisocial, Ed Sheeran and Travis Scott, 2:41

Gossip Folks, Missy Elliot and Ludacris, 3:54

Purple Hat, Sofi Tukker, 2:58

99,Barns Courtney, 3:19

Born To Be Yours, Vibe2Vibe, 3:14

Send Me on My Way, Rusted Root, 4:23

Dreams, The Cranberries, 4:31

This Old Heart of Mine, The Isley Brothers, 2:55

Sing It Out Loud, OMI, 3:41

Punching in a Dream, The Naked And Famous, 3:58

Harder To Breathe, Maroon 5, 2:52

Where the Rivers Flow, Sons of Maria, 3:03

Still Not a Player, Big Pun Joe, 3:56

Train, Brick+Mortar, 3:05

17, Zhavia Ward, 2:46

Critical Mistakes, 888, 3:20

Good News, K.Flay, 3:31

Love is Alive, Louis The Child and Elohim, 2:50

*****DONE READING*****

Reaper, Sia.....3:39
 Good Life, OneRepublic.....4:13
 I Can't Wait, Nu Shooz.....5:26
 The King of Wishful Thinking, Go West.....4:01
 i, Kendrick Lamar.....3:52
 I Wanna Get Better, Bleachers.....3:24
 Be Fine, Madeon.....3:28
 Ain't No Easy Way, Black Rebel Motorcycle Club.....2:36
 Antisocial, Ed Sheeran and Travis Scott.....2:41
 Gossip Folks, Missy Elliot and Ludacris.....3:54
 Purple Hat, Sofi Tukker.....2:58
 99, Barns Courtney.....3:19
 Born To Be Yours, Vibe2Vibe.....3:14
 Send Me on My Way, Rusted Root.....4:23
 Dreams, The Cranberries.....4:31
 This Old Heart of Mine, The Isley Brothers.....2:55
 Sing It Out Loud, OMI.....3:41
 Punching in a Dream, The Naked And Famous.....3:58
 Harder To Breathe, Maroon 5.....2:52
 Where the Rivers Flow, Sons of Maria.....3:03
 Still Not a Player, Big Pun Joe.....3:56
 Train, Brick+Mortar.....3:05
 17, Zhavia Ward.....2:46
 Critical Mistakes, 888.....3:20
 Good News, K.Flay.....3:31
 Love is Alive, Louis The Child and Elohim.....2:50

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

7

The total playlist time is 1:31:36

What do you want to do?

Enter:

- 1 for adding song
- 2 for removing a song
- 3 for moving a song up in the list
- 4 for moving a song down in the list
- 5 for randomly shuffling the list
- 6 for creating a brand new list
- 7 for getting the playlist's time duration
- 8 for exit

8

Bye Now!