

## CS271 Homework 2

**Posted Online:** Tuesday 2007.02.08

**Due Date/Time:** Tuesday 2007.02.20 at Midnight

**Description:** Complete a C++ program that implements a Music CD Organizer using a Multi-List (multiple Linked Lists)

**Files to Submit:** Makefile, main.cpp, musiccd.h, musiccd.cpp, cdorganizer.h, cdorganizer.cpp, singlylinkednode.h, doublylinkednode.h

**Purpose:** To understand and implement the Linked List / Multi-List Data Structures.

**Knowledge Needed:** pointers, c++ classes, singly linked lists, doubly linked lists, multi-lists

**Special Requirements:** You can assume that the ArtistName & AlbumTitle make the cd unique.

**Homework Details:** You will start with a nearly complete C++ program. Download it from the course site. There are 8 files to download (the same 8 files in the "files to submit" section above).

The program will already compile ... but it will not work properly until you finish it.

The main function of the program provides a menu that allows a user to ...

1. Add a Music CD
2. Remove a Music CD
3. Print Cds By Artist
4. Print Cds By Year ASC
5. Print Cds By Year DESC

There are 2 Objects in this C++ program ... musiccd, cdorganizer

The **musiccd** class is already written and is complete.

The **cdorganizer** class is partially written, and you must complete it.

You will only modify 1 of the files ... **cdorganizer.cpp**

(but you may look and analyze the others).

You will fill in / complete the following member functions in this C++ class and you will NOT need to modify any other files or functions in this program.

- ~cdorganizer // destructor
- isEmpty // is the cd organizer empty?
- Exists // does the cd exists in the cd organizer?
- AddCD // add a cd to the cd organizer
- RemoveCD // remove a cd from the cd organizer
- PrintCDsByYearDESC // print the cds in the organizer by Year ASC

You will need to understand 3 Data Structures to complete this homework

- 1.) Singly Linked Lists
- 2.) Doubly Linked Lists
- 3.) Multi-Lists

This program has one Multi-List (the cd organizer class) which itself contains 2 lists  
The Singly Linked List in the cd organizer will be sorted by Artist Name ASC, and if there are any ties ... the tie breaker is the Album Title ASC.

The Doubly Linked Circular List in the cd organizer will be sorted by Year ASC, and if there are any ties ... the tie breaker is the Artist Name ASC.

Again ... **bold** ... is the user input

~> ./cdorganizer

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter): **1**  
Artist Name: **Payable on Death**  
Album Title: **Satellite**  
Album Year: **2000**  
Song Count: **13**  
CD Added Successfully!

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter): **1**  
Artist Name: **Hawk Nelson**  
Album Title: **Smile It's the End of the World**  
Album Year: **2002**  
Song Count: **15**  
CD Added Successfully!

(continued)

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter): **1**

Artist Name: **Various Artists**

Album Title: **Disney**

Album Year: **1995**

Song Count: **22**

CD Added Successfully!

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter): **1**

Artist Name: **Pillar**

Album Title: **Where do we go from here?**

Album Year: **1999**

Song Count: **16**

CD Added Successfully!

(continued)

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

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Choose an Option (hit enter):**3**  
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CDs By Artist  
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- 1.)Hawk Nelson - Smile It's the End of the World (2002) - 15 Songs.
- 2.)Payable on Death - Satellite (2000) - 13 Songs.
- 3.)Pillar - Where do we go from here? (1999) - 16 Songs.
- 4.)Various Artists - Disney (1995) - 22 Songs.

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

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Choose an Option (hit enter):**4**  
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CDs By Year ASC  
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- 1.)Various Artists - Disney (1995) - 22 Songs.
- 2.)Pillar - Where do we go from here? (1999) - 16 Songs.
- 3.)Payable on Death - Satellite (2000) - 13 Songs.
- 4.)Hawk Nelson - Smile It's the End of the World (2002) - 15 Songs.

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter):**5**  
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CDs By Year DESC  
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- 1.)Hawk Nelson - Smile It's the End of the World (2002) - 15 Songs.
- 2.)Payable on Death - Satellite (2000) - 13 Songs.
- 3.)Pillar - Where do we go from here? (1999) - 16 Songs.
- 4.)Various Artists - Disney (1995) - 22 Songs.

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Homework 2 MAIN MENU  
-----

- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

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Choose an Option (hit enter):**2**

Artist Name: **Pillar**

Album Title: **Where do we go from here?**

CD found and removed!

(continued)

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

-----  
Choose an Option (hit enter):3  
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CDs By Artist  
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- 1.)Hawk Nelson - Smile It's the End of the World (2002) - 15 Songs.
- 2.)Payable on Death - Satellite (2000) - 13 Songs.
- 3.)Various Artists - Disney (1995) - 22 Songs.

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Homework 2 MAIN MENU  
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- 1 - Add a Music CD
- 2 - Remove a Music CD
- 3 - Print Collection by Artist
- 4 - Print Collection by Year ASC
- 5 - Print Collection by Year DESC
- X - EXIT PROGRAM

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Choose an Option (hit enter):x  
Goodbye!