

problem set extra - 1

Data Structures
C++ for C Coders

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Topics

- start from lab03.cpp → sort.cpp
- use new, delete, nothrow, and assert
- use a command line argument and GetInt() in nowic.h
 - using libnowic.a - a static library for getting user's input
 - -L../lib or -L./lib or -L../..lib
 - -lnowic, or lnnowic_mac
- use a default parameter;
 - ex: void bubbleSort(int *list, int N, int comp(int, int) = ascending);
- build a library libsort.a, sort.h
- use a function pointer to sort in either ascending or descending order
- use an array of function pointers for performance analysis
 - add timing as in pset02sort.
- **Due: March 18 (Mon) 11:55**
- **Files to submit: sort.cpp, sort.h, libsort.a, sort functions(4) in zipped**

How to

step 1: start from lab03.cpp → sort.cpp

get a copy of all four sort function files. set `#if 1` for `main()` if necessary. build an executable.

step 2: read input from user from a command line and interactively.

use `new`, `delete`, `nothrow`, and `assert`. build an executable.

step 3: define an array of function pointer and initialize with four sort functions.

add a for-loop such that it runs four sort functions one by one. build an executable.

add a code that measure the execution time as you have seen in pset02. test it again.

[Note] don't go the next step unless you code above completely.

step 4: code ascending and descending comparison functions as shown in the fp lecture ppt.

add the ascending function as a default parameter in all four sort functions. build and test it.

change all four sort functions to use the comparison function where it is needed. build and test it.

add a comparison function pointer as an argument when you call a sort function inside the for-loop in sort.cpp.

build and test it.

step 5: create include/sort.h and use include guard `#ifndef` in sort.h

use `#include "sort.h"` and remove sort function proto-types in sort.cpp

build and test it.

step 6: Read idebtor/nowic/UsingStaticLib.md

libsort.a using all four sort functions

build and test it using `lib/libsort.a` and `include/sort.h`