Homework02 – SelectionSort and Code Quality

Due midnight Saturday, March 15, 2014, 3 point

This is an individual assignment; you may not share code with other students. The goal of this homework assists you to know the coding conventions and get familiar with the professional development environment such that you can write a **quality code. The quality code** is **easy to read** and understand. It is **maintained easily** and straightforwardly. Documentation should be at a decent level, or at least the code should be **self-documenting**. Suitable and consistent **naming** of all program identifiers is a must. **Documentation** should be embedded in the code itself.

Rewriting program 1.4

The program 1.4 in the textbook has a lot of items to be improved according to generally accepted industry standard of code quality conventions. Let's rewrite this program such that it follows the coding convention.

There are many items to think about;

1. **Read the hand-out "Code Quality" first and apply them to this homework where applicable.** Be sure that you make good comments about the program.
2. Readability (following the naming convention, or industry standards)
3. Flexibility (allocating memory dynamically - expandable data size)
   This allow you to get rid of some magic numbers in the program in general.
4. Modularization (Having main() and sort() in its own separate file, respectively.)
5. Maintainability (debugging or sharing code)
6. User-friendly interaction (or giving kind input/output message, output format)
7. Correctness (improving the random number in this example)
8. Fixing errors and warnings and not using a magic number if any or if possible.
9. **Don't define SWAP in your source code**, but use that defined in **utility.h** which is available from Piazza. Download it and place it in /include folder in your IDE and add it to your project. **NOTE**: You should have a proper folder structure first. Place the .h file there and change your **Project Property Pages → Configuration → C/C++ → … in VS(or Project Options in Dev-C++)** such that your include path is included during compiling.
10. Maintain your source files in /src folder and include files in /include folder.
    Don't mix them with your .o, .exe, all the other output files generated by compiler or IDE.
    Refer to this development directory structure below.
11. **But,** in this homework, you are **not** to improve the sort algorithm itself yet.

Name your source file as ***SelectionSortStudentID.cpp***.

Include the following line at the top of your every source file with your name signed.

- On my honor, I pledge that I have neither received nor provided improper assistance in the completion of this programming assignment. Signed: ______________

You must have a good comment section at the top of the source file **that include each improvement and reasons you made.**

Guideline for the good code comments

- Include a comment at the beginning of each file with your name, date, the purpose of the program, and how to execute it.

- Include a comment describing every function and variable.
- Indent consistently, using 2 or 4 spaces for each indentation level or soft tab.
- Do not exceed 85 characters per line.
- Avoid unexplained magic numbers, especially ones that are used more than once.

Submitting or posting your solution

- Make sure your code **compiles** and **runs** right before you submit it. Every semester, we get dozens of submissions that don't even compile. Don't make "a tiny last-minute change" and assume your code still compiles. You will not receive sympathy for code that "almost" works.
- If you only manage to work out the homework problem partially before the deadline, you still need to turn it in. However, don't turn it in if it does not compile and run.
- In this semester, I am trying to use the Piazza instead of the good ole^^ home-made Hisnet. The Piazza is well known bulletin board service which has been used recently in many universities including Harvard, Yale, Princeton, MIT, and so on. Maybe you are the first students who use the Piazza among universities in Korea. Post your source file (**SelectionSortStudentID.cpp**) to me personally, not to open to everyone, in Piazza. Your feedback on your homework may be given to you through Piazza. Even if we have not used this kind of process before, let's give us a trial. If it does not work well, you may go back to good ole stuff^^.
- After submitting, if you realize one of your programs is flawed, you may fix it and submit again as long as it is **before the deadline**. You will have to resubmit any related files together, even if you only change one. You may submit as often as you like. **Only the last version** you submit before the deadline will be graded.

Development environment setup

NOTE: Setting up the folders /lib, /include, /src separately at least and placing your source files accordingly. This is a must. This is the first step for you, as a learner of c/c++ programming. The following folder structures are highly recommended.

Development File Folder Structures Recommended for VS

NOTE: The folders listed in boldface below are created ***before*** you start VS. The solution & project folders (e.g. Chapter01, Homework02) are made when you create them inside VS.

~/ProejctsVS			(stores **solutions** such as Chapter01, Chapter02)
	/Chapter01		(stores **projects** such as DebuggingBuggy, Homework02)
		/DebuggingBuggy	
		/Homework02	
		/Homework03	
	/Chapter02		…
	/Chapter03		…
	/lib		(stores .lib, .dll files; tools libraries)
	/include		(stores .h files)
	/src		(stores all source files; .cpp files)
		(optionally you may have sub-folders under the source folder)	
		/tools	(stores tools source files to build .lib)