Programming assignment #1

Sorting

Sorting is a common technique used in various problems, and it is a fundamental operation in the implementation of many data structures. In this assignment, you are required to solve 3 problems related to sorting.

Objective

1. To understand how to design and analyze an algorithm
2. To understand common sorting algorithms
3. To study the concepts of recursion

Program

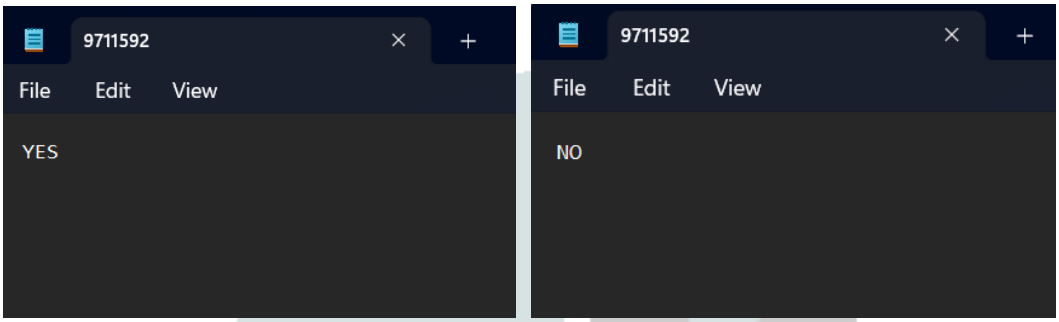
1. The 3 problems are placed on Formosa OJ (NYCU Online Judge System). Please check the tutorial in the last page.
2. Program in C/C++.
3. Sorting algorithms with $O(nlogn)$ complexity are recommended to use.
4. Do not use built-in sorting functions.

Grading

1. TA will randomly check your code. If it's found that you use any built-in sorting function, you will get a penalty of -40 on your grade.
2. Score:
   - Q1: 30%
   - Q2: 30%
   - Q3: 35%
   - Implementation of three sorting algorithms: 5%
3. The score of Q1, Q2, Q3 are evaluated by the OJ system.
4. To encourage you to practice different sorting algorithms, the remaining 5 points are reserved for those who implement 3 specific sorting algorithms: Heap Sort, Merge Sort, and Quick Sort. For each algorithm, you can choose any problem to implement.

Submission

1. Submit 4 files to E3 system: 3 source files and 1 text file.
   - [Student_ID_Number]_hw1_q1.cpp (.c)
   - [Student_ID_Number]_hw1_q2.cpp (.c)
   - [Student_ID_Number]_hw1_q3.cpp (.c)
   - [Student_ID_Number].txt
2. If you implement the 3 sorting algorithms in your source files, please type **YES** in the file [Student_ID_Number].txt. If not, please type **NO**. For example, if your student number is 9711592, the content in the file 9711592.txt will be one of the following screenshots.



3. Please make sure that all characters of the filename are in lower case. For example, if your student number is 9711592, the name of your program file for Q1 should be “9711592_hw1_q1.cpp”.
4. Do not archive the files.
5. Remember the submission rules mentioned above, or you will get punished on your grade by -15.

Due Date

The upload deadline would be at **21:59 on October 17, 2023**.

Problems

1. If you have any problem, please post it on E3 forum.
2. Alternatively, you can send emails to zkxu.ii12@nycu.edu.tw.

↓ Tutorial for Formosa OJ ↓

Formosa OJ

1. Link: https://oj.nctu.edu.tw/signin/
2. Login: Use your NYCU Portal Account

3. Apply for joining the group "黃俊達教授 演算法導論 2023 Fall". TAs will approve your application manually.

4. With TA's approval, you can enter the group.

5. After entering, you will see the following page. Click "Problems" to enjoy your assignment. For more information, please check "使用說明".