Lab3

Deadline: March 2nd at 1:00 p.m.

A. It's time for the annual outstanding farmer competition! Farmer John needs to select his top five cows (in terms of heaviness) for the competition. Consider the following input file *file.in*:

```
8
420
370
332
450
391
278
401
342
```

The first line is an integer indicating the number n ($5 < n < 10000$) of cows. The subsequent n lines are weights (in integer) of the n cows.

Write a C++ program to read in *file.in*, calculate the total weight of the top five cows and print to *stdout* with only one integer:

```
2032
```

Use vector and sort() you learned from the lecture to finish it.

B. Copy the program from pages 30 and 31 in slides "04_Array_Vector." Modify and run experiments with different size values: 1000, 10000, 100000, and 1000000. Use the results to explain the difference between O(n log n) and O(n^2). **Put your results and explanation in *README* file.**

The content of explanation includes which is O(n log n), which is O(n^2), what do you observed, which is faster, and the reasons for being faster.

Hand-in Rules

Pack your files into a zip file (*StudenID.zip*) and upload to Moodle, which includes the following things:

1. Your *.cpp* and *.h* (if any) files for question A.
2. A *file.in* file for testing. (You can copy the contents from question A or design it on your own.)
3. A *Makefile*.
4. A *README* file showing how to compile and execute your program for question A as well as the empirical results and explanation for question B.