

University of Waterloo

CS240 - Fall 2022

Programming Question 1

Due Date: Wednesday October 26 at 5pm

Please read <https://student.cs.uwaterloo.ca/~cs240/f22/assignments.phtml#guidelines> for guidelines on submission. Submit your solution electronically on Marmoset as described below.

There are 6 possible marks available.

Problem 1 [6 marks]

Implement your algorithm from Assignment 2, Problem 5 using C++ and compiled using `g++ -std=c++17` in the `linux.student.cs.uwaterloo.ca` environment. Please note that implementations that are not in $O(1 + k)$ will **not** receive full marks.

Your program should read from `cin` the size n , then the n integers in the heap $A[0 \dots n - 1]$, and finally the integer c , and then write to `cout` the integers in the heap that are greater than or equal to c . You may assume that every integer in the input is at least 0 and at most $2^{31} - 1$ (so that every integer will fit into a variable of type `int`).

Every integer in the input and output should be on a separate line. So for instance if the input consists of the following lines:

```
5
17
15
13
10
3
12
```

then your program should print out the integers 17, 15, and 13 in any order (and on separate lines). Note, '5' represents n , so the next 5 numbers '17, 15, 13, 10, 3' represent what goes in the heap, and '12' represents c .

Submit the code for your `main` function, along with any helper functions, in a file called `report.cpp`.