Information Regarding HW1 (and lab sessions)

Each homework has a set of written problems and implementation (programming) problems. The total score of these problems will be larger than 100. However, if you score x points for the homework, your final score for this homework will be given by $0.1 \cdot \min\{x, 100\}$. There will be four homeworks and you can get at most 10 points from each of them. You are encouraged to discuss the homework (especially the programming problems) with your classmates, but copy-paste is not allowed.

Submission of Homework. After finishing each homework (both the written problems and the programming problems), please prepare a single zip file containing all materials and submit it via Moodle before the deadline. In particular, for the written problems, please prepare an electronic version, e.g., by scanning or taking clear phones, and generate a pdf file for submission; for programming problems, please put all source codes in the zip file.

Partial Code for Homework. For the programming problems, some partially finished code will be provided by the TA (using C++) and posted to Moodle. You can use it to solve the problems by completing the unfinished parts. In HW1, the heap is implemented using an array, where we index the n elements by $0, 1, \ldots, n-1$ from top-level to bottom-level, and for each level from left to right. For each node $i \geq 1$, the index of its parent is given by $(i-1)/2$ and its two children (if exist) will be given by $2i+1$ and $2i+2$.

Programming Language. The use of C++ is compulsory, and the partial code will only be provided in C++. However, if you have a strong reason that you cannot use C++, please contact the instructor and the TAs with your reason and proof for an evaluation. Regardless of the programming language you use, please make sure that your code compiles normally, takes inputs and generates outputs as required (following the same format as the partial code we have provided). Example of the output looks like:

```
List of elements in the priority queue: 5
List of elements in the priority queue: 5 9
List of elements in the priority queue: 5 9 2
List of elements in the priority queue: 5 9 2 7
The minimum element in the priority queue is: 2
List of elements in the priority queue: 5 9 7
The size of the priority queue is: 3
Error: there is no element to be remove!
The priority queue is empty: true
List of elements in the priority queue: 12
List of elements in the priority queue: 12 8
List of elements in the priority queue: 12 8 40
List of elements in the priority queue: 12 8 40 6
List of elements in the priority queue: 12 8 40 6 25
List of elements in the priority queue: 12 8 40 6 25 81
List of elements in the priority queue: 12 8 40 6 25 81 30
List of elements in the priority queue: 12 8 40 6 25 81 30 4
List of elements in the priority queue: 12 8 40 6 25 81 30 4 15
List of elements in the priority queue: 12 8 40 6 25 81 30 4 15 2
List of elements in the priority queue: 12 8 40 6 25 81 30 4 15
List of elements in the priority queue: 12 8 40 6 25 81 30 15
List of elements in the priority queue: 12 8 40 25 81 30 15
List of elements in the priority queue: 12 40 25 81 30 15
List of elements in the priority queue: 40 25 81 30 15
List of elements in the priority queue: 40 25 81 30
List of elements in the priority queue: 40 81 30
List of elements in the priority queue: 40 81
List of elements in the priority queue: 81
List of elements in the priority queue:
2 4 6 8 12 15 25 30 40 81
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Lab Sessions. There will be no teaching during the lab exercise but our TA will be there to answer your questions. The purpose of the lab exercise is to provide a chance for you to finish the programming questions of homeworks while our TA can provide some assistance. Since there are no desktops in the classroom, please bring your own laptops for lab sessions. Attendance will be recorded.

If you have any questions, please don't hesitate to send emails to our TAs (you can find their names and emails on Moodle).