**CENG311 Homework 2 Report**

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In max binary heap implementation of Priority Queue in C programming language, I divided different features to different function definitions like reading file, writing to file, creating the structure, traversing the structure etc. First program reads the file and creates the int pointer. Then using this pointer program creates priority queue with just using indexes without nodes and structures. Program does this with loop and adding current element to the end of the array and pushes the element up until the parent data is bigger than the current element and measures time while performing this operation.

After creating the queue program creates the structure using node structure. Program does this using recursion. Convert function takes empty node as parameter allocates memory for that node and then assigns data, left node pointer and right node pointer if exists in the array.

Lastly, program traverses the structure using recursion and creates array that includes elements with following child and parent index rules and then writes to file called “result.txt”.

**Note:** For measuring the execution time, I used integers instead of because in Java I got OutOfMemoryError while creating the queue even though I set size to be , but there was no problem with C.

When integers are ordered execution took 0.000011 for 20 integers and 26.888435 for integers in C implementation.

In Java implementation I used PriorityQueue class. When integers are ordered execution took 0.004 seconds for 20 elements and 28.09 seconds for integers.

When Integers are randomly generated execution took 2.266456 seconds in C, and 4.914 seconds in Java. That’s because in ordered data, it will push every element but when integers are random it might not require to be pushed. So, the worst case comes with ordered data.

Files Included:

* c\_implementation
* java\_implementation
* generate\_integers.py
* CENG311\_HW2\_REPORT\_260201006.docx

Sources

* <https://stackoverflow.com/questions/28893017/converting-an-array-into-binary-tree-using-c>