NTIN066 - practicals 1

David Mareček

February 15, 2023

1. What is the difference between $O(g(n))$, $\Omega(g(n))$, and $\Theta(g(n))$?

2. Make a queue from two stacks
You have two stacks, supporting only the POP and PUSH operations. Propose an algorithm, that would simulate a Queue with operations ENQUEUE and DEQUEUE. Besides the two stacks, you have only a constant amount of memory. Show that the queue operations have a constant amortized time complexity.

3. Flexible arrays with $C' = 3C$
Compute the amortized time complexity of a single append, if the newly allocated memory is always three-times bigger.

4. Flexible arrays with $C' = C + D$
Compute the amortized time complexity of a single append, if the newly allocated memory is always bigger by a constant D.

5. Add to front
So far, new elements could be added only to the end of array. Is it possible to modify the array so that we can also add elements to the front? And what about deleting elements?