# Practice problems for amortized analysis

1. A sequence of stack operations is performed on stack whose size never exceeds k. After every k operations, a copy of the entire stack is made for backup purposes. Show that the cost of n stack operations, including copying the stack, is O(n) using the accounting method and potential method.
2. Will the O(1) amortized cost if increments in a k-bit binary counter remain valid if you also allow decrement operations (i.e, in any sequence of intermixed increment and decrement operations)? If yes, show the amortized analysis. If not, justify why not.
3. Consider the implementation of a queue using two stacks A and B (I am sure you all know this implementation). Find the amortized cost of a sequence of n enqueue and dequeue operation using each of aggregate, accounting, and potential method.