CPSC 221
Two-week self-assessment
SUMMER 2015

1. If g(n) = 3 + 6 + 9 + ... + 3n, then it can be proven that g(n) is (choose the best one):

a) O(log n) b) O(n log n) **c) O(n^2)** d) O(1) e) O(n)

2. If we can prove that g(n) is O(n log n) then it follows that g(n) is also O(e^n)

a) true b) false

3. If we can prove that g(n) is O(n log n) then it follows that g(n) is also O(log n)

a) true **b) false**

4. To prevent a queue, which is represented as an array in memory, from travelling through memory as elements are enqueued and dequeued, and to confine its travel to a bounded region, we should:

a) use a modular arithmetic representation for adding and removing elements.
b) periodically empty the queue so it contains no elements and readjust the starting point for its one-directional travel.
c) move the queue elements back one space each time an element is removed.
d) none of the above.

5. Let S be a stack such that S = (23, 56, 47) with the top of the stack being the leftmost element, and let X be a variable. Now suppose we perform the following operations: pop(S); X = top(S); pop(S); pop(S); push(X). Then the stack S that results from these operations is:

a) S = () b) S = (47) c) S = (56, 47) **d) S = (56)** e) S = (47, 56)

6. In a linked representation of a queue, it is advantageous to use two pointers, one to point to the front and one to point to the rear.

a) true b) false

7. In a linked representation of a stack, it is advantageous to use two pointers, one to point to the top and one to point to the bottom.

a) true **b) false**

8. What is the best O-notation for $3n^2 + 2n + 1$?

a) O(1) b) O(n) c) O(n log n) **d) $O(n^2)$** e) $O(n^3)$ f) $O(n^4)$

9. What is the best O-notation for $(n + 3)(\lg n + 2) + (n + \log n)(n - \log n)$?

a) O(1) b) O(n) c) O(n log n) **d) $O(n^2)$** e) $O(n^3)$ f) $O(n^4)$

10. What do we call a sequential data structure in which both insertions and deletions are allowed at both ends?

a) a stack
b) a queue
c) both a and b
d) none of the above