Name: _____ October 17, 2013

Quiz 1

1. List all the steps (including any comparisons) used to search for 9 in the sequence $1, 3, 4, 5, 6, 8, 9, 11$ using

   a) a linear search

   b) a binary search

2. Give a big-O estimate for each of these functions. For the function g in your estimate $f(x)$ is $O(g(x))$, use a simple function g of smallest order.

   a) $n \log(n^2 + 1) + n^2 \log n$

   b) $(n \log n + 1)^2 + (\log n + 1)(n^2 + 1)$

   c) $n^{2^n} + n^{n^2}$

3. Arrange the following functions in a list so that each function is big-O of the next function:
$$\log n, n^n, n \log n, n^{10}, n, 10^n, 1, n!$$

4. Give a big-O estimate for the number of operations, where an operation is an addition or a multiplication, used in this segment of an algorithm.

```
m := 0
for i := 1 → n do
    for j := i + 1 → n do
        m := max(a_i a_j, m)
```