Discussion 3

1. Arrange the functions \((1.5)^n, n^{100}, (\log n)^3, \sqrt{n} \log n, 10^n, (n!)^2, n^{99} + n^{98}\) in a list so that each function is big-O of the next function.

\(\text{(cf. Rosen 3.2 Exercise 22)}\)
2.

procedure Statements($n > 1$)
1. for $i := 1$ to 10
2. Statement A.
3. for $j := 1$ to $n$
4. Statement B.
5. for $k := 1$ to 4
6. for $\ell := 1$ to $n$
7. Statement C.

1. Which statement (A, B, or C) is executed the most number of times?

2. Suppose that Statement A requires $3n$ comparison operations, Statement B requires $n^2$ comparisons, and Statement C requires 30 comparisons. How many total comparisons does the entire pseudocode segment require? What is the order of this algorithm in $\Theta$ notation?