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Assignment 1 Solutions

1. See tictactoe.py file
2. L[n-1] A. This only retrieves the last element in the list.

1 in L C. This will iterate over each element in L to search for 1, n number of times.

1. n^3 + 20n + 1 ≤ c(n)\*n^2

n + 20/n + 1/n ≤ c (divide each side by n^2)

n = 2, c = 10

2 + 10 + ½ ! ≤ 10

1. n^3 + 20n ≥ c\*n^2

n + 20/n ≥ c

n = 5, c = 9

5+4 ≥ 9

1. 2^64-1, 2^1000, log n, log n^2, log n^3, n, 2^log n, 10000n, n log n, 0.0001n^2, n^2log n, n^3, n^3 log n, n^100, (3/2)^n, 2^n, n2^n, 4^n, n^n
2. F(n) ≤ cg(n) for n ≥ n0 = 1

5n + 10 ≤ c\*n^2

5/n + 10/n^2 ≤ c

c = 15, n = 1

5 + 10 ≤ 15

1. 1) O(n)

The highest n will be for the for look that iterates n-1 times.

2) O(log n)

The highest n will be for the for loop that increments by 2, which would be log n.

3) O(n^2)

The highest n will be n^2 because of the nested for loop.

4) O(n)

The highest n will be the for loop that runs n times.

5) O(n^3)

There are 3 for loops so the highest n is n^3.