**CS310 Data Structures and Algorithms Spring 2020**

**Extra Credit Assignment #2**

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1. What is the tightest bound Big O for the following: (10 Points)
2. f(N) = (1/2) (N log N) + (log N) 2  \_\_\_\_\_(log N)^2\_\_\_\_\_
3. f(N) = N2 \* (N + N log N + 1000) \_\_\_\_\_N^3 log N\_\_\_\_\_\_\_\_\_\_\_
4. f(N) = N2 log N + 2N \_\_\_\_\_\_2^N\_\_\_\_\_\_
5. f(N) = ( (1/2) (3N + 5 + N) ) 4  \_\_\_\_\_\_\_N^4\_\_\_\_\_\_\_\_\_
6. f(N) = (2N + 5 + N4 ) / N \_\_\_\_ N^3\_\_\_\_\_\_\_\_\_\_
7. f(N) = log10(2N ) \_\_\_\_\_\_N\_\_\_\_\_\_\_\_\_\_\_\_
8. f(N) = N! + 2N \_\_\_\_\_\_N!\_\_\_\_\_\_\_\_\_\_\_\_
9. f(N) = (N \* N \* N \* N + 2N)2  \_\_\_\_\_\_\_\_N^8\_\_\_\_\_\_\_\_\_\_
10. f(N) = N½ + log N \_\_\_\_\_\_\_N^(1/2)\_\_\_\_\_\_\_
11. f(N) = N log (1003 ) \_\_\_\_\_\_\_\_\_N\_\_\_\_\_\_\_\_\_\_
12. Give the tightest bound in terms of Big O, of the following code snippets(10 Points)
13. **public type something(n){**

**result = 0;**

**while (n > 1){**

**n /= 2;**

**result += 1;**

**}**

**return result;**

**}**

**O(Log N)**

1. **public type something(n, a[]){**

**for (i=0, i<n; i++){**

**if (a[i] == 0)**

**return 0;**

**}**

**return 1;**

**}**

**O(N)**

1. **public type something(n){**

**result = 0;**

**for (i=0, i<n; i++){**

**for (int j=i; j<n;j++){**

**result += 1;**

**}**

**}**

**return result;**

**}**

**O(N^2)**

1. **int count =0;**

**for(int i=n;i>0;i/=2)**

**for(int j=0;j<i;j++)**

**count++;**

**O(LOG N)**

1. **void silly(int n)**

**{**

**for (int i = 0; i < n \* n; ++i) {**

**for (int j = 0; j < n; ++j) {**

**for (int k = 0; k < i; ++k)**

**System.out.println(”k = ” + k);**

**for (int m = 0; m < 100; ++m)**

**System.out.println(”m = ” + m);**

**}**

**}**

**}**

**O(N^5)**