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Pledge: I pledge my honor that I have abided by the Stevens Honor System.

Give the complexity of the following functions. Choose the most appropriate notation from among , , and .

1. **void** **function1**(**int** n) {

**for** (**int** i = 1; i <= n; i++) {

**for** (**int** j = i; j <= n; j += 2) {

cout << "\*";

}

}

}

Answer:

1. **void** **function2**(**int** n) {

**int** count = 0;

**for** (**int** i = 1; i \* i \* i <= n; i++) {

count++;

}

cout << count;

}

Answer: )

1. **void** **function3**(**int** n) {

**int** count = 0;

**for** (**int** i = 1; i \* i <= n; i++) {

**for** (**int** j = 1; j + n/2 <= n; j++) {

**for** (**int** k = 1; k <= n; k \*= 2) {

count++;

}

}

}

cout << count;

}

Answer:

1. **void** **function4**(**int** n) {

**int** count = 0;

**for** (**int** i = n/2; i <= n; i++) {

**for** (**int** j = 1; j <= n; j \*= 2) {

**for** (**int** k = 1; k <= n; k \*= 2) {

count++;

}

}

}

cout << count;

}

Answer:

1. **void** **function5**(**int** n) {

**if** (n % 2 == 0) {

**return**;

}

**for** (**int** i = 1; i <= n; i++) {

**for** (**int** j = 1; j <= n; j++) {

cout << "\*";

**break**;

}

}

}

Answer: O(n^2)

1. **void** **function6**(**int** n) {

**int** count = 0;

**for** (**int** i = 1; i <= n/2; i++) {

**for** (**int** j = 1; j <= n/3; j++) {

**for** (**int** k = 1; k <= n/4; k++) {

count++;

}

}

}

cout << count;

}

Answer

1. **void** **function7**(**int** n) {

**for** (**int** i = 1; i <= n; i++) {

**for** (**int** j = 1; j <= n; j += i) {

cout << "\*";

}

}

}

Answer:(nlg(n))

1. **void** **function8**(**int** n) {

**int** i = 1, s = 1;

**while** (s <= n) {

i++;

s += i;

cout << "\*";

}

}

Answer: √n)

1. Processing Arrays
   1. Suppose you have an unsorted array of integers of length and want to sum all the elements inside it. What is the running time of your algorithm? n)
   2. Suppose you have an unsorted array of integers of length and want to determine if all the values inside are positive. What is the running time of your algorithm? n)
   3. Suppose you have a sorted array of integers of length and want to determine the median value. What is the running time of your algorithm? 1)
2. True- T / F

If true, prove it by giving *integral* values for the required constants , , and . Choose the tightest values possible for the and constants. If false, show the contradiction.

5n^2 + 4n + 8 >= c1 n^2

If c1 = 5 then,

5n^2 + 4n + 8 >= 5n^2

4n +8 >= 0

5n^2 + 4n + 8 >= c2 n^2

If c2 = 6 then,

5n^2 + 4n + 8 >= 6n^2

4n +8 <= n^2

n^2 -4n -8 >= 0

n > = 5.464

c1 = 4

c2 = 6

n0 = 6