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CS502 Assignment 1 Solution

Fall 2026

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CS502 — Design and Analysis of Algorithms

Assignment No. 1 — Fall 2026 | Sample Solution

Question 01: Execution Count of Each Statement

Step No	Statement	Number of times
1	int n, count = 0;	1
2	for i = 1 to n;	n + 1
3	if (n % i == 0)	n
4	print (i);	Number of factors of n
5	count = count + 1;	Number of factors of n
6	print (count);	1

Note: Steps 4 and 5 run only when i divides n. For example, for n = 6 the factors are 1, 2, 3 and 6, so steps 4 and 5 execute 4 times. Step 2 executes n + 1 times because the loop condition is also checked once when i becomes n + 1 and the loop stops.

Question 02: Total Time Complexity T(n)

Let c be the number of factors of n. Adding the execution counts of all steps:

$T(n) = 1 + (n + 1) + n + c + c + 1 = 2n + 2c + 3$

Since the number of factors c can never exceed n, the dominant term is n. Therefore, the total time complexity is O(n), i.e. linear time complexity.