Finding Time Complexity of Algorithms

Problem 1: Finding Complexity using Counter Method

Aim:

Convert the following algorithm into a program and find its time complexity using the counter method.  
void function (int n)  
{  
    int i= 1;

int s =1;

    while(s <= n)  
    {  
         i++;  
         s += i;  
     }        
}       
**Note:** No need of counter increment for declarations and scanf() and  count variable printf() statements.  
  
**Input:** A positive Integer n  
**Output:**Print the value of the counter variable

**For example:**

| **Input** | **Result** |
| --- | --- |
| 9 | 12 |

Algoritm:

1. **Step 1:** Initialize i = 1, count = 0, and s = 1.
2. **Step 2:** Increment count for the variable initializations.
3. **Step 3:** Take input n using scanf. Increment count.
4. **Step 4:** Check the condition s <= n. If true, go to Step 5; otherwise, go to Step 7. Increment count.
5. **Step 5:**
   * Increment i by 1.
   * Add i to s (update s = s + i).
   * Increment count for both operations.
6. **Step 6:** Repeat Step 4.
7. **Step 7:** Print the value of count. Increment count.
8. **End.**

Code:

#include <stdio.h>

int main()

{

int i= 1,count=0;

count++;

int s =1;

count++;

int n;

scanf("%d",&n);

while(s <= n)

{

count++;

i++;

count++;

s += i;

count++;

}

count++;

printf("%d",count);

}

Output:

|  | **Input** | **Expected** | **Got** |  |
| --- | --- | --- | --- | --- |
|  | 9 | 12 | 12 |  |
|  | 4 | 9 | 9 |  |

Passed all tests!

**Correct**

Marks for this submission: 1.00/1.00.

Result:

The expected output is obtained