RAJALAKSHMI ENGINEERING COLLEGE RAJALAKSHMI NAGAR, THANDALAM – 602 105



CS23331 DESIGN AND ANALYSIS OF ALGORITHM LAB

Laboratory Observation Note Book

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$Year / Branch / Section : \frac{2^{nd} Year / AIML / A}{}$
Register No. :
Semester : 3 rd Semester
Academic Year : 2024-2025

<u>WEEK – 02</u> <u>Finding Complexity using Counter Method</u>

1) 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;
   }
}</pre>
```

Note: No need of counter increment for declarations and scanf() and count variable printf() statements.

Input:

A positive Integer n

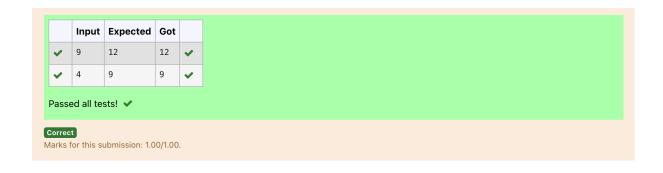
Output:

Print the value of the counter variable

For example:

Input	Result
9	12

```
#include<stdio.h>
void function (int n)
{
  int c=0;
  int i= 1;
  c++;
  int s =1;
  c++;
```



2) Convert the following algorithm into a program and find its time complexity using the counter method.

```
void func(int n)
{
    if(n==1)
    {
       printf("*");
    }
    else
    {
       for(int i=1; i<=n; i++)
       {
            printf("*");
            printf("*");
            break;
       }
       }
    }
}</pre>
```

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

```
#include <stdio.h>
void func(int n)
{
  int c=0;
  if(n==1)
```

```
C++;
  printf("*");
  C++;
 else
 {
  C++;
  for(int i=1; i<=n; i++)
   C++;
   for(int j=1; j<=n; j++)
   {
     C++;
     //printf("*");
     C++;
     //printf("*");
     C++;
     break;
   C++;
  }
  C++;
 printf("%d",c);
int main()
{
  int n;
  scanf("%d",&n);
  func(n);
```

input Ex	xpected	Got				
2 12	2	12	~			
1000 50	002	5002	~			
143 71	17	717	~			
ssed all tests!	ests! ✔					

3) Convert the following algorithm into a program and find its time complexity using counter method.

```
Factor(num) {
    for (i = 1; i <= num;++i)
    {
      if (num % i== 0)
         {
         printf("%d ", i);
      }
    }
}</pre>
```

Note: No need of counter increment for declarations and scanf() and counter variable printf() statement.

Input:

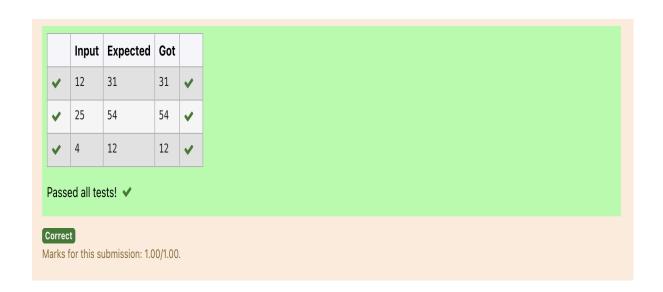
A positive Integer n

Output:

Print the value of the counter variable

```
#include<stdio.h>
void Factor(int num)
{
   int c=0,i;

   for (i = 1; i <= num;++i)
   {
      c++;
      c++;
      if (num % i== 0)
      {
}</pre>
```



4) Convert the following algorithm into a program and find its time

complexity using counter method.

Note: No need of counter increment for declarations and scanf() and count variable printf() statements.

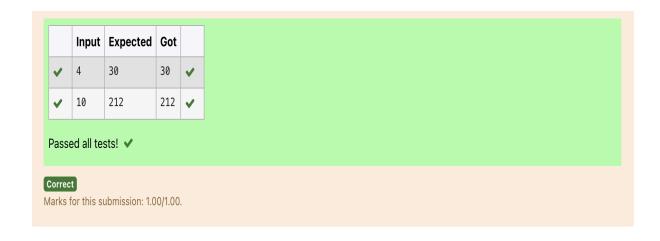
Input:

A positive Integer n

Output:

Print the value of the counter variable

```
#include<stdio.h>
void function(int n)
{
   int count=0;
   int c= 0;
   count++;
   for(int i=n/2; i<n; i++)
   {
      count++;
      for(int j=1; j<n; j = 2 * j)
      {
       count++;
      for(int k=1; k<n; k = k * 2)
      {
}</pre>
```



5) Convert the following algorithm into a program and find its time complexity using counter method.

```
void reverse(int n)
{
   int rev = 0, remainder;
   while (n != 0)
   {
      remainder = n % 10;
      rev = rev * 10 + remainder;
      n/= 10;
   }
print(rev);
}
```

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

```
#include<stdio.h>
void reverse(int n)
{
   int count=0;
   int rev = 0, remainder;
   count++;
   while (n != 0)
   {
      count++;
      remainder = n % 10;
```

```
count++;
    rev = rev * 10 + remainder;
    count++;
    n/= 10;
    count++;
  }
  count++;
  //printf("%d",rev);
  count++;
  printf("%d",count);
}
int main()
{
  int n;
  scanf("%d",&n);
  reverse(n);
}
```

