**RAJALAKSHMI ENGINEERING COLLEGE**

**RAJALAKSHMI NAGAR, THANDALAM – 602 105**

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| **CS23331**  **DESIGN AND ANALYSIS OF ALGORITHM LAB** |
| **Laboratory Observation Note Book** |

**WEEK – 02**

**Finding Complexity using Counter Method**

**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;  
     }        
}       
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** |

**CODE:**

#include<stdio.h>

void function (int n)

{

int c=0;

int i= 1;

c++;

int s =1;

c++;

while(s <= n)

{

c++;

i++;

c++;

s += i;

c++;

}

c++;

printf("%d",c);

}

int main()

{

int n;

scanf("%d",&n);

function(n);

}

**OUTPUT:**

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**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++)**

**{**

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

**{**

**printf("\*");**

**printf("\*");**

**break;**

**}**

**}**

**}**

**}**

**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**

**CODE:**

#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);

}

**OUTPUT:**

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**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);  
        }          
    }   
 }  
   
   
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**

**CODE:**

#include<stdio.h>

void Factor(int num)

{

int c=0,i;

for (i = 1; i <= num;++i)

{

c++;

c++;

if (num % i== 0)

{

//printf("%d ", i);

c++;

}

}

c++;

printf("%d",c);

}

int main()

{

int num;

scanf("%d",&num);

Factor(num);

}

**OUPUT:**

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

**complexity using counter method.  
              
void function(int n)  
{  
    int c= 0;  
    for(int i=n/2; i<n; i++)  
        for(int j=1; j<n; j = 2 \* j)  
            for(int k=1; k<n; k = k \* 2)  
                c++;  
}  
   
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**

**CODE:**

#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)

{

count++;

c++;

count++;

}

count++;

}

count++;

}

count++;

printf("%d",count);

}

int main()

{

int n;

scanf("%d",&n);

function(n);

}

**OUTPUT:**

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**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**

**CODE:**

#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);

}

**OUTPUT:**

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