

Answer of Assignment 5– 14.01.2021

SUBJECT-PROGRAMMING AND DATA STRUCTURE USING C (PDSC)

LECTURE-M. Thangavel

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1. find the sum of first 10 natural numbers. (Using for loop)

Ans:-

```
#include <stdio.h>
void main()
{
    int i, sum = 0;

    printf("The first 10 natural number is :\n");

    for (i = 1; i <= 10; i++)
    {
        sum = sum + i;
        printf("%d ",i);
    }
    printf("\nThe Sum is : %d\n", sum);
}
```

Output:-

```
8
9  #include <stdio.h>
10 void main()
11 {
12     int i, sum = 0;
13
14     printf("The first 10 natural number is :\n");
15
16     for (i = 1; i <= 10; i++)
17     {
18         sum = sum + i;
19         printf("%d ", i);
20     }
21     printf("\nThe Sum is : %d\n", sum);
22 }
```

The first 10 natural number is :
1 2 3 4 5 6 7 8 9 10
The Sum is : 55

2. display the multiplication table of a given integer.

Ans:-

```
#include <stdio.h>
void main()
{
    int i,n;
    printf("Input the number:");
    scanf("%d",&n);
    printf("\n");
    i=1;
    while(i<=10)
    {
        printf("%d X %d = %d \n",n,i,n*i);
        i++;
    }
}
```

Output:-

```
Input the number:89
```

```
89 X 1 = 89
89 X 2 = 178
89 X 3 = 267
89 X 4 = 356
89 X 5 = 445
89 X 6 = 534
89 X 7 = 623
89 X 8 = 712
89 X 9 = 801
89 X 10 = 890
```

3. display the pattern like right angle triangles. (Using for loop).

```
*
**
***
****
```

Ans:-

```
#include <stdio.h>
void main()
{
    int i,j,rows;
    printf("Input number of rows : ");
    scanf("%d",&rows);
    for(i=1;i<=rows;i++)
    {
        for(j=1;j<=i;j++)
            printf("*");
        printf("\n");
    }
}
```

Output:-

```
9  #include <stdio.h>
10 void main()
11 {
12     int i,j,rows;
13     printf("Input number of rows : ");
14     scanf("%d",&rows);
15     for(i=1;i<=rows;i++)
16     {
17         for(j=1;j<=i;j++)
18             printf("*");
19         printf("\n");
20     }
21 }
```

Input number of rows : 4

```
*
**
***
****
```

4. display the n terms of odd natural number and their sum (Using do...while loop).

Ans:-

```
#include <stdio.h>
void main()
{
    int i=1,n,sum=0;
    printf("Input number of terms : ");
    scanf("%d",&n);
    printf("\nThe odd numbers are :");
    do
    {
        printf("%d ",2*i-1);
        sum+=2*i-1;
        i++;
    }
    while(i<=n);
    printf("\nThe Sum of odd Natural Number upto %d terms : %d \n",n,sum);
}
```

Output:-

```
8
9  #include <stdio.h>
10 void main()
11 {
12     int i=1,n,sum=0;
13
14     printf("Input number of terms : ");
15     scanf("%d",&n);
16     printf("\nThe odd numbers are :");
17     do
18     {
19         |
20         printf("%d ",2*i-1);
21         sum+=2*i-1;
22         i++;
23     }
24     while(i<=n);
25     printf("\nThe Sum of odd Natural Number upto %d terms : %d \n",n,sum);
26 }
```

input

Input number of terms : 3

The odd numbers are :1 3 5

The Sum of odd Natural Number upto 3 terms : 9

5. display the pattern like right angle triangles. (Using while loop).

```
1
2 3
4 5 6
7 8 9 10
```

Ans:-

```
#include <stdio.h>
```

```
int main(){
```

```
int i=1,j=0,k=1;
```

```
while(i<=4){
```

```
    j=0;
```

```
    while(j<i){
```

```
        printf("%d ",k);
```

```
        k++;
```

```
        j++;
```

```
    }
```

```
    printf("\n");
```

```
    i++;
```

```
}
```

```
return 0;
}
```

Output:-

```
1
2 3
4 5 6
7 8 9 10
```

6. make such a pattern like a pyramid with numbers (Using do...while loop)

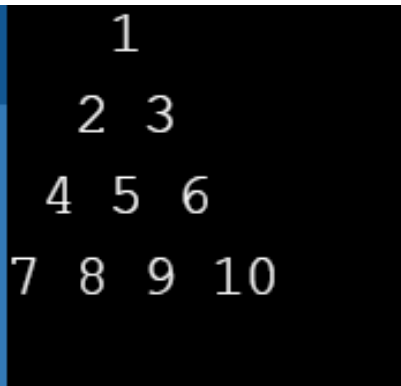
```
1
2 3
4 5 6
7 8 9 10
```

Ans:-

```
#include <stdio.h>
int main(){
int i=1,j=0,k=1,s=1;
do{
    s=i;
    j=0;
    while(s<=3){
        printf(" ");
        s++;
    }
    while(j<i){
        printf("%d ",k);
        k++;
        j++;
    }
    printf("\n");
    i++;
}while(i<=4);

return 0;
}
```

Output:-



```
1
2 3
4 5 6
7 8 9 10
```

7. display the first n terms of Fibonacci series. (Using for loop).

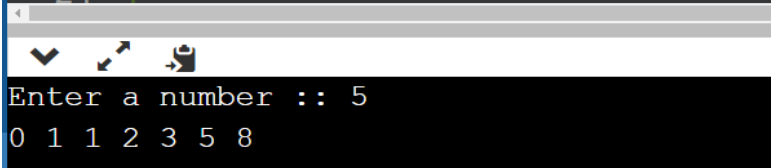
Ans:-

```
#include <stdio.h>

int main()
{
    int a = 0,b=1,sum =0,n,i;
    printf("Enter a number :: ");
    scanf("%d",&n);
    printf("%d %d ",a,b);
    for(i=0;i<n;i++){
        sum = a + b;
        printf("%d ",sum);
        a = b;
        b = sum;
    }
    return 0;
}
```

Output:

```
8
9  #include <stdio.h>
10 int main()
11 {
12  int a = 0,b=1,sum =0,n,i;
13  printf("Enter a number :: ");
14  scanf("%d",&n);
15  printf("%d %d ",a,b);
16  for(i=0;i<n;i++){
17      sum = a + b;
18      printf("%d ",sum);
19      a = b;
20      b = sum;
21  }
22  return 0;
23 }
24
```



Enter a number :: 5
0 1 1 2 3 5 8

9. check whether a given number is a perfect number or not. (Using while loop).

Ans:-

```
#include <stdio.h>

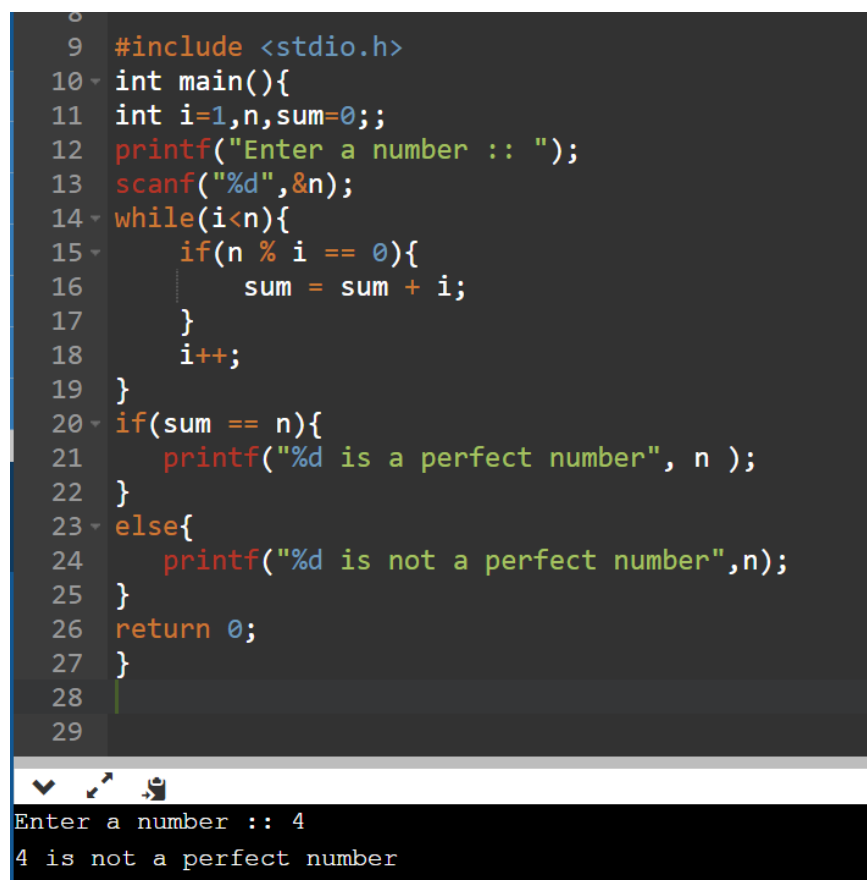
int main(){
    int i=1,n,sum=0;;
    printf("Enter a number :: ");
    scanf("%d",&n);
    while(i<n){
        if(n % i == 0){
            sum = sum + i;
        }
        i++;
    }
    if(sum == n){
        printf("%d is a perfect number", n );
    }
}
```



```
}  
else{  
    printf("%d is not a perfect number",n);  
}  
return 0;  
}
```

Output:

```
8  
9  #include <stdio.h>  
10 int main(){  
11     int i=1,n,sum=0;;  
12     printf("Enter a number :: ");  
13     scanf("%d",&n);  
14     while(i<n){  
15         if(n % i == 0){  
16             sum = sum + i;  
17         }  
18         i++;  
19     }  
20     if(sum == n){  
21         printf("%d is a perfect number", n );  
22     }  
23     else{  
24         printf("%d is not a perfect number",n);  
25     }  
26     return 0;  
27 }  
28  
29
```



Enter a number :: 4
4 is not a perfect number

10. find the Armstrong number for a given range of number. (Using while loop).

Ans:-

```
#include <stdio.h>
```

```
int main(){
```

```
int n,n1,d,x,sum=0;
```

```
printf("Enter a number :: ");
```

```
scanf("%d",&n);
```

```
n1 = n ;
```

```
while(n > 0){
```

```
    d = n % 10;
```

```
    sum = sum + (d * d * d) ;
```

```
    n = n / 10;
```

```
}
```

```
if(sum == n1){
```

```
    printf("%d is a Armstrong number",n1);
```

```
}
```

```
else{
```

```
    printf("%d is not a Armstrong number",n1);
```

```
}
```

```
return 0;
```

```
}
```

Output:

```
8
9  #include <stdio.h>
10 int main(){
11     int n,n1,d,x,sum=0;
12     printf("Enter a number :: ");
13     scanf("%d",&n);
14     n1 = n ;
15     while(n > 0){
16         d = n % 10;
17         sum = sum + (d * d * d) ;
18         n = n / 10;
19     }
20     if(sum == n1){
21         printf("%d is a Armstrong number",n1);
22     }
23     else{
24         printf("%d is not a Armstrong number",n1);
25     }
26     return 0;
27 }
28
29
```

Enter a number :: 7
7 is not a Armstrong number

11. determine whether a given number is prime or not. (Using do...while loop).

Ans:-

```
#include <stdio.h>
```

```
int main(){
```

```
int n,d,i=1,c=0;
```

```
printf("Enter a number :: ");
```

```
scanf("%d",&n);
```

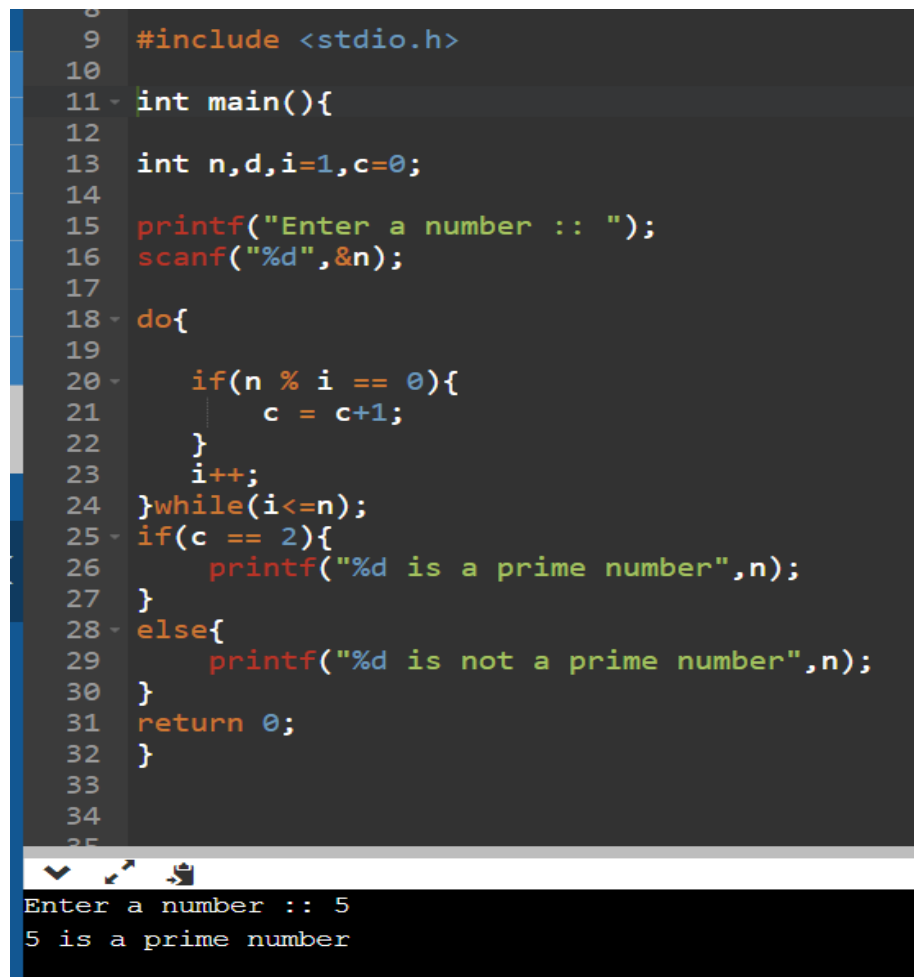
```
do{
```

```

    if(n % i == 0){
        c = c+1;
    }
    i++;
}while(i<=n);
if(c == 2){
    printf("%d is a prime number",n);
}
else{
    printf("%d is not a prime number",n);
}
return 0;
}

```

Output:-



The image shows a screenshot of a C program in a code editor and its execution output. The code is a program to check if a number is prime. It includes `<stdio.h>`, defines `main()`, and declares variables `n`, `d`, `i`, and `c`. It prompts the user to enter a number, reads it into `n`, and then uses a `do-while` loop to check for divisibility. If the number is prime (count of divisors is 2), it prints a message; otherwise, it prints a message indicating it is not prime. The output shows the user entering 5, and the program correctly identifying it as a prime number.

```

8
9  #include <stdio.h>
10
11 int main(){
12
13     int n,d,i=1,c=0;
14
15     printf("Enter a number :: ");
16     scanf("%d",&n);
17
18     do{
19
20         if(n % i == 0){
21             c = c+1;
22         }
23         i++;
24     }while(i<=n);
25     if(c == 2){
26         printf("%d is a prime number",n);
27     }
28     else{
29         printf("%d is not a prime number",n);
30     }
31     return 0;
32 }
33
34
35

```

Enter a number :: 5
5 is a prime number

12. display the number in reverse order. (Using do...while loop).

Ans:-

```
#include <stdio.h>

int main(){
    int n,d,i=1,c=0;
    printf("Enter a number :: ");
    scanf("%d",&n);
    printf("Befor reverse the number is = %d \n",n);
    printf("After reverse the number is = ");
    do{
        d = n % 10;

        printf("%d",d);

        n /= 10;
    }
    while(n>0);

    return 0;
}
```

Output:

```
9  #include <stdio.h>
10
11 int main(){
12
13     int n,d,i=1,c=0;
14
15     printf("Enter a number :: ");
16     scanf("%d",&n);
17     printf("Befor reverse the number is = %d \n",n);
18     printf("After reverse the number is = ");
19     do{
20         d = n % 10;
21
22         printf("%d",d);
23
24         n /= 10;
25     }while(n>0);
26
27     return 0;
28 }
29
```

```
Enter a number :: 457
Befor reverse the number is = 457
After reverse the number is = 754
```

13. display the sum of the series [9 + 99 + 999 + 9999 ...] (Using for loop).

Ans:-

```
#include <stdio.h>
```

```
int main(){
```

```
int i,n,j=9,sum=0;
```

```
printf("Enter a number :: ");
```

```
scanf("%d",&n);
```

```
for(i=0;i<n;i++){
```

```
    sum = j + sum;
```

```
    printf("%d ",j);
```

```
    j = j * 10 + 9;
```

```
}
```

```
printf("= %d",sum);
```

```
return 0;
```

```
}
```

Output:

```
9  #include <stdio.h>
10
11  int main(){
12  int i,n,j=9,sum=0;
13
14  printf("Enter a number :: ");
15  scanf("%d",&n);
16
17  for(i=0;i<n;i++){
18      sum = j + sum;
19      printf("%d  ",j);
20      j = j * 10 + 9;
21
22  }
23  printf("= %d",sum);
24  return 0;
25  }
26
27
```



Enter a number :: 5

9 99 999 9999 99999 = 111105

14. find the sum of the series [$x - x^3 + x^5 + \dots$]. (Using do...while loop)

Ans:-

```
#include <stdio.h>
```

```
int main(){
```

```
int i,n,j=1,s,a=1,b=1,sum=0;
```

```
printf("input series number :: ");
```

```
scanf("%d",&n);
```

```
printf("input a number :: ");
```

```
scanf("%d",&s);
```

```
for(i=0;i<n;i++){
```

```
    a = 1;
```

```
    for(j=1;j<=b;j++){
```

```
        a = a * s;
```

```
    }
```

```
        sum = sum + a;
```

```
        b = b + 2;
```

```
}
```

```
printf("sum of series is = %d",sum);
```

```
return 0;
```

```
}
```

Output:-

```
input series number :: 4  
input a number :: 2  
sum of series is = 170
```