SOL_ PW _N° 05

SOL Exercise N° 01:

Q 01: --Program 01

```c
/* C program to find sum of natural
numbers between 1 to n */
#include <stdio.h>
int main(){
    int i, n, sum=0;
    // Input upper limit from user
    printf("Enter upper limit: ");
    scanf("%d", &n);
    // Find sum of all numbers
    for(i=1; i<=n; i++)
    {
        sum =sum + i;
    }
    printf("sum= %d", sum);
    return 0; }
```

Program 01_RUN 1
OUT PUT :
Enter upper limit: 4
sum= 10

Program 01_ RUN 2
OUT PUT :
Enter upper limit:
1000000
sum= 1784293664

Q 02:—Program02 :

```c
#include <stdio.h>
int main() {
    int sum = 0,n;
    int i = 1;
 // Input upper limit from user
    printf("Enter upper limit: ");
    scanf("%d", &n);
    // While loop to iterate from 1 to n
    while (i <= n) {
        sum += i;
        i++;
    }
    // Print the result
    printf("The sum is: %d\n", sum);
    return 0; }
```

Program 02 _RUN 1
OUT PUT :
Enter upper limit: 4
The sum is: 10

Program 02_ RUN 2
OUT PUT :
Enter upper limit:
1000000
The sum is:
1784293664

By Dr. KECITA farouk

SOL Exercise N° 02:

Q 1 :

Program 01

```c
/*C program to print all natural
 numbers from 1 to n*/
#include <stdio.h>
int main() {
    int i, N;
    /* Input upper limit from user */
    printf("Enter any number: ");
    scanf("%d", &N);
    printf("Natural_numb from 1 to %d:\n",N);
    for(i=1; i<=N; i++)
    {
        printf("%d\n", i);
    }
    return 0; }
```

Program 01

OUT PUT :

```
Natural_numb from 1 to 8:
1
2
3
4
5
6
7
8
```

Q 02:—Program01:

```c
/*C program to print all natural numbers
  from 1 to n using while loop */
#include <stdio.h>
int main() {
    int i, N;
    //Input a number from user
    printf("Natural numbers from 1 to: ");
    scanf("%d", &N);
    // Print natural numbers from 1 to N
    i=1;
    while(i<=N)
    {
        printf("%d\n", i);
        i++;
    }
    return 0;}
```

Program 01

OUT PUT :

```
Natural numbers from 1 to: 8
1
2
3
4
5
6
7
8
```

Q 03:—Program01:

```c
/*C program to print all natural numbers
  from 1 to n using while loop */
#include <stdio.h>
int main() {
    int i, N;
    //Input a number from user
    printf("Natural numbers from 1 to: ");
    scanf("%d", &N);
    // Print natural numbers from 1 to N
    i=1;
    do
    {
        printf("%d\n", i);
        i++;
    }
    while(i<=N);
    return 0;}
```

Program 01
OUT PUT:

```
Natural numbers from 1 to: 8
1
2
3
4
5
6
7
8
```

SOL Exercise N° 03:

Q 1 : Program 01

```c
/* C program to print all even numbers
 from 1 to n */
#include <stdio.h>
int main() {
    int i, N;
//Input upper limit of even number from user
    printf("Print all even numbers till: ");
    scanf("%d", &N);
    printf("Even numb from 1 to %d are:\n",N);
    for(i=1; i<=N; i++) {
// Check even condition before printing
        if(i%2 == 0)
        {
            printf("%d\n", i);
        }
    }
    return 0;}
```

Program 01
OUT PUT:

```
Print all even numbers till: 10
Even numb from 1 to 10 are:
2
4
6
8
10
```

Q 2 : Program 01

```c
/*C program to print all Odd
 numbers from 1 to n */
#include <stdio.h>
int main() {
    int i, N;
    // Input upper limit from user
    printf("Print odd numbers till: ");
    scanf("%d", &N);
    printf("odd numb from 1 to %d are:\n",N);
    for(i=1; i<=N; i++) {
    // If 'i' is odd then print it
        if(i%2!=0)
        {
            printf("%d\n", i);
        }
    }
    return 0;  }
```

Program 01
OUT PUT:

```
Print odd numbers till: 10
odd numb from 1 to 10 are:
1
3
5
7
9
```

SOL Exercise N° 04: Q 1 : Program 01

```c
/* C program to print sum of all
even numbers between 1 to n */
#include <stdio.h>
int main() {
    int j, N, sum=0;
    /* Input upper limit from user */
    printf("Enter upper limit: ");
    scanf("%d", &N);
    for(j=2; j<=N; j++)  {
        if(j%2 == 0)
        {
     // Add current even number to sum
        sum += j;
        }
    }
printf("Sum of all even number b/w 1 to %d
=%d",N,sum);
    return 0; }
```

Program 01
OUT PUT:

```
Enter upper limit: 10
Sum of all even number b/w 1 to 10 =30
```

Q 2 : Program 01

```c
/* C program to print sum of all
even numbers between 1 to n */
#include <stdio.h>
int main() {
    int j=1, N, sum=0;
    /* Input upper limit from user */
    printf("Enter upper limit: ");
    scanf("%d", &N);
   while(j<=N )  {
        if(j%2 == 0)
        {
     // Add current even number to sum
        sum += j;
        }
        j++;
    }
printf("Sum of all even number b/w 1 to %d
=%d",N,sum);
    return 0; }
```

Program 01

OUT PUT:

Enter upper limit: 10
Sum of all even number b/w 1 to 10 =30

SOL Exercise N° 05: Q 1 : Program 01

```c
#include <stdio.h>
int main(){
   int i, n,num, sum = 0;
   printf("Input number of terms : ");
   scanf("%d", &n);
   printf("\nThe entered numbers are:");
   for(i = 1; i <= n; i++)
   {
     scanf("%d", &num);
     if(num%2==0){
      sum += num;
     }
}
printf("\nThe Sum of even Natural
Number:%d\n", sum);
return 0;}
```

Program 01

OUT PUT:

```
Input number of terms:
5
The entered numbers
are :
12
15
28
200
111
The Sum of even
Natural Number: 240
```

SOL Exercise N° 06: Q 1 : Program 01

```c
#include <stdio.h>
int main() {
    int i = 1,N,num, sumEven=0,sumOdd=0;
    printf("Input number of integers: ");
   scanf("%d", &N);
   printf("\nThe entered numbers are :");
    // Calculate the sum of even and odd numbers
    do {
        // Check if the current number is even
        scanf("%d", &num);
     if(num%2==0)
            sumEven+= 1;
        else
            sumOdd += 1;
        i++;
    } while (i <= N);
    printf("Sum of even numbers: %d\n", sumEven);
    printf("Sum of odd numbers: %d\n", sumOdd);
    return 0;  }
```

Program 01

OUT PUT:

```
Input number of
integers: 5

The entered numbers
are:
1
12
30
55
10
Sum of even numbers: 3
Sum of odd numbers: 2
```

Q 2: Program 01

```c
#include <stdio.h>
int main() {
    int num, sum = 0;
    printf("Input a numbers (input a
negative_number to stop): ");
    do {
        scanf("%d", &num);
        if (num >= 0) {
            sum += num;
        }
    } while (num >= 0);
   printf("Sum of all positive numbers:
%d\n", sum);
    return 0;  }
```

Program 01
OUT PUT:

```
Input a number (input a negative number to stop): 4
5
4
56
-5
Sum of all positive numbers: 69
```

SOL Exercise N° 07: Q 1 : Program 01

```c
/* C program to all natural numbers
 in reverse in given range */
#include <stdio.h>
int main()
{
    int i, start, end;
    // Input start limit from user
    printf("Enter starting value: ");
    scanf("%d", &start);
    for(i=start; i>=1; i--)
    {
        printf("%d\n", i);
    }
    return 0;
}
```

Program 01
OUT PUT:

```
Enter starting value: 8
8
7
6
5
4
3
2
1
```

SOL Exercise N° 08: Q 1 : Program 01

```c
// C program to print right half pyramid pattern of star
#include <stdio.h>
int main() {
    int rows = 5;
    // first loop for printing rows
    for (int i = 0; i < rows; i++) {
        // second loop for printing character in each rows
        for (int j = 0; j <= i; j++) {
            printf("* ");
        }
        printf("\n");
    }
    return 0;}
```

OUTPUT:

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

PROGRAM:02

```c
// C program to print right half pyramid pattern
of number
#include <stdio.h>
int main() {
    int rows = 5;
    // first loop for printing rows
    for (int i = 0; i < rows; i++) {
 // second loop for printing number in each rows
        for (int j = 1; j <= i; j++) {
            printf("%d ", j);
        }
        printf("\n");
    }
    return 0; }
```

OUTPUT:

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

PROGRAM:03

```c
/*C program to print the inverted left half pyramid
pattern of numbers*/
#include <stdio.h>
int main() {
int rows = 5;
// first loop for printing all rows
for (int i = 0; i < rows; i++) {
// first inner loop for printing white spaces
for (int j = 0; j <  i; j++) {
printf("  ");
}
// second inner loop for printing numbers
for (int k = 1; k <= rows - i; k++) {
printf("%d ", k);
}
printf("\n");
}
return 0; }
```

OUTPUT:

```
1 2 3 4 5
  1 2 3 4
    1 2 3
      1 2
        1
```

SOL Exercise N° 09: Q 1 : Program 01

```c
#include<stdio.h>
   int main()
   {
   int n,i,f;
   f=i=1;
   printf("Enter the number n: ");
   scanf("%d",&n);
   while(i<=n)
   {
   f*=i;
   i++;
   }
   printf("factorial(%d)= %d\n",n,f);
   printf("or %d!= %d\n",n,f);
   return 0;
```

OUTPUT:

```
Enter the number n: 5
factorial(5)= 120
or 5!= 120
```

PROGRAM :02

```c
#include<stdio.h>

int main(){
int n,i,f;
f=i=1;
printf("Enter the number n: ");
scanf("%d",&n);
while(i<=n) {
f*=i;
i++;
}
printf("factorial(%d)= %d\n",n,f);
printf("or %d!= %d\n",n,f);
return 0;}
```

OUTPUT:

```
Enter the number n: 5
factorial(5)= 120
or 5!= 120
```

SOL Exercise N° 10: Q 1 : Program 01

```c
#include<stdio.h>

int main()
{
int n,i,f;
f=i=1;
printf("Enter the number n: ");
scanf("%d",&n);
while(i<=n)
{
f*=i;
i++;
}
printf("factorial(%d)= %d\n",n,f);
printf("or %d!= %d\n",n,f);
return 0; }
```

OUTPUT:

factorial(1)= 1

factorial(2)= 2

factorial(3)= 6

factorial(4)= 24

factorial(5)= 120

factorial(6)= 720

factorial(7)= 5040

factorial(8)= 40320

factorial(9)= 362880

PROGRAM : 02

```c
#include <stdio.h>

int main ( ){
long factorial ;
int k ,a=1,n ;
printf("Enter the number n:");
scanf("%d",&n);
do {
factorial=1 ;
k=1 ;
do {
factorial*=k ;
++k ;
}
while (k<=a);
printf("%d!= %d\n",a,factorial) ;
++a ;
}
while (a<=n);
return 0;
}
```

OUTPUT:

```
Enter the number n:10
1!= 1
2!= 2
3!= 6
4!= 24
5!= 120
6!= 720
7!= 5040
```

SOL Exercise N° 11: Q 1 : Program 01

```c
//C program to print Fibonacci series up to 100
    #include<stdio.h>
    int main()
    {
    int a=1,b=1,c=0,i;
    printf("****Fibonacci series upto100****\n");
    printf("%d\t%d\t",a,b);
    for(i=0;i<=10;i++)
    {
    c=a+b;
    if(c<=100)
    {
    printf("%d\t",c);
    }
    a=b;
    b=c;
    }
    return 0;
 }
```

OUTPUT:

```
****Fibonacci series upto 100****
    1 1 2 3 5 8 13 21 34 55 89
```

PROGRAM : 02

```c
#include <stdio.h>

int main() {
int a=0,b=1,c,i;
printf("Fibonacci series upto 100\n");
printf("%d\t%d\t",a,b);
c=a+b;
do
{
printf("%d\t",c);
a=b;
b=c;
c=a+b;
}
while(c<=100);
return 0;
}
```

OUTPUT:

```
Fibonacci series upto 100
   0 1 1 2 3 5 8 13 21 34 55 89
```

PROGRAM : 03

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

    int main() {
    int i,n;
 // initialize first and second terms
    int t1 = 0, t2 = 1;
 // initialize the next term (3rd term)
    int nextTerm = t1 + t2;
    // get no. of terms from user
  printf("Enter the number of terms: ");
    scanf("%d", &n);
    printf("Fibonacci Series : ");
    printf(" %d, %d, ", t1, t2);
    // print 3rd to nth terms
    while ( nextTerm<= n) {
    printf("%d, ", nextTerm);
    t1 = t2;
    t2 = nextTerm;
    nextTerm = t1 + t2;
    }
    return 0; }
```

OUTPUT:

```
Enter the number of terms: 100
Fibonacci Series :
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89,
```