

Loops

- Used to execute a block of statements several times.
- Let we want to print “KIIT is the best” 10 times.
- Either you write printf statement 10 times, or use a loop.
- Types of loops:
 1. while
 2. do while
 3. for

while loop

```
while (condition)
{
    statement;
    statement;
    -----
}
```

P1. Print the numbers from 1 to 10 using while loop

```
main( )  
{  
    int i=1;  
    while(i<=10)  
    {  
        printf("%d\t",i);  
        i=i+1;    /*Statement that changes the value of condition */  
    }  
    printf("\n");  
}
```

Output:

1 2 3 4 5 6 7 8 9 10

P2. Print numbers in reverse order with a difference of 2

```
main( )  
{  
    int k=10;  
    while(k>=2)  
    {  
        printf("%d\t",k);  
        k=k-2;  
    }  
    printf("\n");  
}
```

Output:

10

8

6

4

2

P3. Print the sum of digits of any number

Output:

Enter the number : 1452

Sum of digits = 12

```
main( )
{
    int n,sum=0,rem;
    printf("Enter the number : ");
    scanf("%d", &n);
    while(n>0)
    {
        rem=n%10; /* taking last digit of number */
        sum+=rem;
        n/=10;    /* skipping last digit */
    }
    printf("Sum of digits = %d\n",sum);
}
```

P4. Print the product of digits of any number

```
main( )
{
    int n,prod=1,rem;
    printf("Enter the number : ");
    scanf("%d",&n);
    while(n>0)
    {
        rem=n%10;          /*taking last digit*/
        prod*=rem;
        n/=10;             /*skipping last digit of number*/
    }
    printf("Product of digits = %d\n",prod);
}
```

Output :

Enter the number : 234
Product of digits = 24

P5. Find the factorial of any number

```
main( )
{
    int  n,num;
    long fact=1;
    printf("Enter the number : ");
    scanf("%d",&n);
    num=n;
    if(n<0)
        printf("No factorial of negative number\n");
```



```
else
{
    while(n>1)
    {
        fact*=n;
        n- -;
    }
    printf("Factorial of %d = %ld\n", num, fact);
}
}
```

Output:

Enter the number : 4
Factorial of 4 = 24

P6. Convert a binary number to a decimal number

```
main( )
{
    int  n,nsave,rem,d,j=1,dec=0;
    printf("Enter the number in binary : ");
    scanf("%d",&n);
    nsave=n;
    while(n>0)
    {
        rem=n%10;          /*taking last digit*/
        d=rem*j;
        dec+=d;
        j*=2;
        n/=10;             /*skipping last digit*/
    }
    printf("Binary number = %d, Decimal number = %d\n",nsave,dec);
}
```

do...while loop

```
do
{
    statement;
    statement;
    -----
}while(condition);
```

P7. Print the numbers from 1 to 10 using do...while loop

```
main()  
{  
    int i=1;  
    do  
    {  
        printf("%d\t", i);  
        i=i+1;  
    }while(i<=10);  
    printf("\n");  
}
```

P8. Count the digits of a number using do...while loop

```
main( )
{
    int n,count=0,rem;
    printf("Enter the number : ");
    scanf("%d",&n);
    do
    {
        n/=10;
        count++;
    }while(n>0);
    printf("Number of digits = %d\n",count);
}
```

P9. Find the sum of numbers entered using do...while loop

```
main( )
{
    int  num, sum=0;
    do
    {
        printf("Enter a number (0 to stop) : ");
        scanf("%d", &num);
        sum+=num;
    }while(num!=0);
    printf("Sum is %d\n", sum);
}
```