

# Functions in C

# Types:

## Builtin functions:

These functions are defaultly present in the system library. Therefore it is also called Library Functions. e.g. `scanf()` , `printf()` , `strcpy` , `strlwr` , `strcmp` , `strlen` , `strcat` , etc. You must include the appropriate C header files to use these functions.

## User defined functions:

A user-defined function is a type of function in C language that is defined by the user himself to perform some specific task. It provides code reusability and modularity to our program

## User defined functions:

1. Basic building blocks of the program, which performs a task.
2. These are group of statements which can be written once and use it multiple times.
3. In order to reduce rewriting of the same code again and again.

## General syntax:

### Declaration:

```
returntype function_name(arguments.....);
```

### Definition:

```
returntype function_name(arguments.....)
{
    //body of function
}
```

### Function call;

```
function_name(parameters);
```

# Example:

```
#include<stdio.h>

void average(int, int, int, int, int);

void main()
{
    int a,b,c,d,e;
    printf("\n calculate the average of five numbers:");
    printf("\nEnter five numbers:");
    scanf("%d %d %d %d %d",&a,&b,&c,&d,&e);
    printf("The average of given nos is:%f",average(a,b,c,d,e));
}

void average(int n, int m, int o, int p, int q)
{
    float avg;
    avg = (n+m+o+p+q)/5;
    return avg;
}
```

## output:

```
calculate the average of five numbers:
Enter five numbers:10 20 30 40 50
The average of given nos is: 30.000000
```

## Examples:

```
#include<stdio.h>

int square()
{
    int side;
    printf("Enter the length of the side in meters: ");
    scanf("%d",&side);
    printf("The area of the square: %d\n",side*side);
}
```

```
void main()
{
    printf(" calculate the area of the square\n");
    square();

}
```

## output:

```
calculate the area of the square
Enter the length of the side in meters: 10
The area of the square: 100
```

# Builtin Functions:

## String functions: (#include <string.h>)

strlen()

It returns the string's length.

strcpy()

It copies one string into another.

strcmp()

It compares two strings and returns 0 if the strings are the same.

strchr()

It finds out the first occurrence of a given character in a string.

strcat()

It concatenates two strings and returns the concatenated string.

strstr()

It finds out the first occurrence of a given string in a string.

# Math functions:(#include <math.h>)

ceil(number)

rounds up the given number. It returns the integer value which is greater than or equal to given number.

floor(number)

rounds down the given number. It returns the integer value which is less than or equal to given number.

sqrt(number)

returns the square root of given number.

pow(base, exponent)

returns the power of given number

abs(number)

returns the absolute value of given number.

exp(x)

Returns the value of  $e^x$

sin(x)

Returns the sine of x (x is in radians)

cos(x)

Returns the cosine of x

tan(x)

Returns the tangent of an angle

## Call by value:

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## Call by reference:

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