Function:

A function is a collection of statements grouped together to do some specific task. C function can be classified into two categories, namely, **library functions** and **user-defined functions**. **Main is an example of user-defined functions.**

|  |  |
| --- | --- |
| User-defined Functions | Library Functions |
| main, any other function created by programmer. | printf(), scanf(), sqrt(), pow() etc. |

The main distinction between these two caegories is that library functions are not required to be written by us whereas a user-defined function has to be developed by the user/programmer at the time of writing a program. **Every program must have a main function to indicate where the program has to begin its execution.**

While it is possible to code any program utilizining only main function, it leads to a number of problems. The program may become too large and complex. But if a program is divided into functional parts, then each part may be independently codded and later combined into a single unit. These independently codded programs are called subprograms that are much easier to understand, debug and test. In C, such subprograms are refered to as functions.

There are times when certain type of operations or calculations are repeated at many points throughout the program. For instance, we might use the factorial of a number at several points in the program. In such situations, we may repeat the program statements whereever they are needed. **Another approach is to design a function that can be called and used whenever required.** This saves both time and space.

Advantages of Function:

1. It facilates top-down modular programming
2. The length of source program can be reduced by using functions at appropriate places.
3. It is easy to locate and isolate a faulty function for further investigations.
4. A function may be used by many other programs.

Syntax of C function:

return\_type name(argument\_1,...,argument\_n)

{

statements/operations

}

Lets see an example: **C program to find cube of any number using function**

#include <stdio.h>

/\* Function declaration \*/

int main()

{

int num;

double c;

/\* Input number to find cube from user \*/

printf("Enter any number: ");

scanf("%d", &num);

c = cube(num);

printf("Cube of %d is %.2f", num, c);

return 0;

}

/\* Function to find cube of any number\*/

double cube(double num)

{

return (num \* num \* num);

}

1. The above program contains two user-defined functions: main() function and cube(double num) function.
2. The program execution always start from main () function.
3. Program will show the message “Enter any number:” and take input from user.
4. Then it will execute c = cube (num); line. At this point the program control is transferred to the function cube (double num).
5. Then function cube (num) calculate the result.
6. Finally it will return the result to main() function again.

*For more example :* [*https://codeforwin.org/2016/03/functions-programming-exercises-and-solutions-in-c.html*](https://codeforwin.org/2016/03/functions-programming-exercises-and-solutions-in-c.html)