



Hire with us!



Data Types in C

Each variable in C has an associated data type. Each data type requires different amounts of memory and has some specific operations which can be performed over it. Let us briefly describe them one by one:

Following are the examples of some very common data types used in C:

- **char:** The most basic data type in C. It stores a single character and requires a single byte of memory in almost all compilers.
- **int:** As the name suggests, an int variable is used to store an integer.
- **float:** It is used to store decimal numbers (numbers with floating point value) with single precision.
- **double:** It is used to store decimal numbers (numbers with floating point value) with double precision.

Different data types also have different ranges upto which they can store numbers. These ranges may vary from compiler to compiler. Below is list of ranges along with the memory requirement and format specifiers on 32 bit gcc compiler.

DATA TYPE	MEMORY (BYTES)	RANGE	FORMAT SPECIFIER
short int	2	-32,768 to 32,767	%hd
unsigned short int	2	0 to 65,535	%hu
unsigned int	4	0 to 4,294,967,295	%u
int	4	-2,147,483,648 to 2,147,483,647	%d
long int	4	-2,147,483,648 to 2,147,483,647	%ld
unsigned long int	4	0 to 4,294,967,295	%lu
long long int	8	$-(2^{63})$ to $(2^{63})-1$	%lld
unsigned long long int	8	0 to 18,446,744,073,709,551	%llu

signed char	1	-128 to 127	%c
unsigned char	1	0 to 255	%c
float	4		%f
double	8		%lf
long double	12		%Lf

We can use the **sizeof() operator** to check the size of a variable. See the following C program for the usage of the various data types:

```
#include <stdio.h>
int main()
{
    int a = 1;
    char b = 'G';
    double c = 3.14;
    printf("Hello World!\n");

    //printing the variables defined above along with their sizes
    printf("Hello! I am a character. My value is %c and "
           "my size is %lu byte.\n", b, sizeof(char));
    //can use sizeof(b) above as well

    printf("Hello! I am an integer. My value is %d and "
           "my size is %lu bytes.\n", a, sizeof(int));
    //can use sizeof(a) above as well

    printf("Hello! I am a double floating point variable."
           " My value is %lf and my size is %lu bytes.\n", c, sizeof(double));
    //can use sizeof(c) above as well

    printf("Bye! See you soon. :)\n");

    return 0;
}
```

Output:

```
Hello World!
Hello! I am a character. My value is G and my size is 1 byte.
Hello! I am an integer. My value is 1 and my size is 4 bytes.
Hello! I am a double floating point variable. My value is 3.140000 and my size is 8 bytes.
Bye! See you soon. :)
```

This article is contributed by Ayush Jaggi. Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above

Recommended Posts:

[Difference between fundamental data types and derived data types](#)

[C++ Data Types](#)

[C | Data Types | Question 1](#)

[C | Data Types | Question 2](#)

[C | Data Types | Question 6](#)

[C | Data Types | Question 7](#)

[C | Data Types | Question 8](#)

 [C | Data Types | Question 9](#)

 [C | Data Types | Question 4](#)

[C | Data Types | Question 5](#)

[What are the data types for which it is not possible to create an array?](#)

[Uninitialized primitive data types in C/C++](#)

[Linking Files having same variables with different data types in C](#)

[Interesting facts about data-types and modifiers in C/C++](#)

[What happen when we exceed valid range of built-in data types in C++?](#)

Article Tags : [C](#) [C Basics](#) [C-Data Types](#)

Practice Tags : [C](#)



1.5

☐ To-do ☐ Done

Based on 58 vote(s)

Feedback/ Suggest Improvement

Add Notes

Improve Article

Please write to us at contribute@geeksforgeeks.org to report any issue with the above content.

Previous

[Variables and Keywords in C](#)

Next

[Static Variables in C](#)

[>](#)

Writing code in comment? Please use ide.geeksforgeeks.org, generate link and share the link here.

Load Comments







THE TECHNICAL CONTENT WRITING
EVENT BY **GEEKSFORGEEKS**



LAST DATE OF SUBMISSION
HAS BEEN EXTENDED TO

11TH

FEB

2020



**₹25,000 CASH PRIZE
AND MANY MORE**



Most popular in C

[asctime\(\) and asctime_s\(\) functions in C with Examples](#)

[time.h localtime\(\) function in C with Examples](#)

[Difference between C and C#](#)

[return statement in C/C++ with Examples](#)

[size of char datatype and char array in C](#)

Most Visited Articles

Expand the string according to the given conditions

How did Apple Become World's First \$1 Trillion Company?

Find the integers that doesnot ends with T1 or T2 when squared and added X

Program to Encrypt a String using ! and @

Compare two strings considering only alphanumeric characters



GeeksforGeeks

A computer science portal for geeks

5th Floor, A-118,
Sector-136, Noida, Uttar Pradesh - 201305
feedback@geeksforgeeks.org

COMPANY

About Us
Careers
Privacy Policy
Contact Us

PRACTICE

Courses
Company-wise
Topic-wise
How to begin?

LEARN

Algorithms
Data Structures
Languages
CS Subjects
Video Tutorials

CONTRIBUTE

Write an Article
Write Interview Experience
Internships
Videos



@geeksforgeeks, Some rights reserved

