Data Type Ranges

Article • 06/14/2024

The Microsoft C++ 32-bit and 64-bit compilers recognize the types in the table later in this article.

```
C++
```

```
- int (unsigned int)
- __int8 (unsigned __int8)
- __int16 (unsigned __int16)
- __int32 (unsigned __int32)
- __int64 (unsigned __int64)
- short (unsigned short)
- long (unsigned long)
- long long (unsigned long long)
```

If its name begins with two underscores (__), the data type is nonstandard.

The ranges specified in the following table are inclusive-inclusive.

Expand table

Type Name	Bytes	Other Names	Range of Values
`int`	4	`signed`	-2,147,483,648 to 2,147,483,647
`unsigned int`	4	`unsigned`	0 to 4,294,967,295
`__int8`	1	`char`	-128 to 127
`unsigned __int8`	1	`unsigned char`	0 to 255
`__int16`	2	`short`, `short int`, `signed short int`	-32,768 to 32,767
`unsigned __int16`	2	`unsigned short`, `unsigned short int`	0 to 65,535
`__int32`	4	`signed`, `signed int`, `int`	-2,147,483,648 to 2,147,483,647
`unsigned __int32`	4	`unsigned`, `unsigned int`	0 to 4,294,967,295
`__int64`	8	`long long`, `signed long long`	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807

Type Name	Bytes	Other Names	Range of Values
`unsigned __int64`	8	`unsigned long long`	0 to 18,446,744,073,709,551,615
`bool`	1	none	`false` or `true`
`char`	1	none	-128 to 127 by default 0 to 255 when compiled by using /J
`signed char`	1	none	-128 to 127
`unsigned char`	1	none	0 to 255
`short`	2	`short int`, `signed short int`	-32,768 to 32,767
`unsigned short`	2	`unsigned short int`	0 to 65,535
`long`	4	`long int`, `signed long int`	-2,147,483,648 to 2,147,483,647
`unsigned long`	4	`unsigned long int`	0 to 4,294,967,295
`long long`	8	none (but equivalent to `__int64`)	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
`unsigned long long`	8	none (but equivalent to `unsigned __int64`)	0 to 18,446,744,073,709,551,615
`enum`	varies	none	
`float`	4	none	3.4E +/- 38 (seven digits)
`double`	8	none	1.7E +/- 308 (fifteen digits)
`long double`	same as `double`	none	Same as `double`
`wchar_t`	2	`__wchar_t`	0 to 65,535

A variable of `__wchar_t` designates either a wide-character type or multibyte-character type. Use the `L` prefix before a character or string constant to designate the wide-character-type constant.

`signed` and `unsigned` are modifiers that you can use with any integral type except `bool`. Note that `char`, `signed char`, and `unsigned char` are three distinct types for the

purposes of mechanisms like overloading and templates.

The **`int`** and **`unsigned int`** types have a size of 4 bytes. However, portable code shouldn't depend on the size of **`int`** because the language standard allows this to be implementation-specific.

C/C++ in Visual Studio also supports sized integer types. For more information, see __int8, __int16, __int32, __int64 and Integer Limits.

For more information about the restrictions of the sizes of each type, see Built-in types.

The range of enumerated types varies depending on the language context and specified compiler flags. For more information, see C Enumeration Declarations and Enumerations.

See also

Keywords
Built-in types

Feedback