

NAME

`floor`, `floorf`, `floorl` – largest integral value not greater than argument

SYNOPSIS

```
#include <math.h>
```

```
double floor(double x);
```

```
float floorf(float x);
```

```
long double floorl(long double x);
```

Link with `-lm`.

Feature Test Macro Requirements for glibc (see `feature_test_macros(7)`):

```
floorf(), floorl():
```

```
_ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
```

```
|| /* Since glibc 2.19: */ _DEFAULT_SOURCE
```

```
|| /* Glibc versions <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

DESCRIPTION

These functions return the largest integral value that is not greater than x .

For example, `floor(0.5)` is 0.0, and `floor(-0.5)` is -1.0.

RETURN VALUE

These functions return the floor of x .

If x is integral, +0, -0, NaN, or an infinity, x itself is returned.

ERRORS

No errors occur. POSIX.1-2001 documents a range error for overflows, but see NOTES.

ATTRIBUTES

For an explanation of the terms used in this section, see `attributes(7)`.

Interface	Attribute	Value
<code>floor()</code> , <code>floorf()</code> , <code>floorl()</code>	Thread safety	MT-Safe

CONFORMING TO

C99, POSIX.1-2001, POSIX.1-2008.

The variant returning *double* also conforms to SVr4, 4.3BSD, C89.

NOTES

SUSv2 and POSIX.1-2001 contain text about overflow (which might set *errno* to **ERANGE**, or raise an **FE_OVERFLOW** exception). In practice, the result cannot overflow on any current machine, so this error-handling stuff is just nonsense. (More precisely, overflow can happen only when the maximum value of the exponent is smaller than the number of mantissa bits. For the IEEE-754 standard 32-bit and 64-bit floating-point numbers the maximum value of the exponent is 128 (respectively, 1024), and the number of mantissa bits is 24 (respectively, 53).)

SEE ALSO

`ceil(3)`, `lrint(3)`, `nearbyint(3)`, `rint(3)`, `round(3)`, `trunc(3)`

COLOPHON

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