

NAME

nearbyint, nearbyintf, nearbyintl, rint, rintf, rintl – round to nearest integer

LIBRARY

Math library (*libm*, *-lm*)

SYNOPSIS

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

```
double nearbyint(double x);
float nearbyintf(float x);
long double nearbyintl(long double x);

double rint(double x);
float rintf(float x);
long double rintl(long double x);
```

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

```
nearbyint(), nearbyintf(), nearbyintl():
    _POSIX_C_SOURCE >= 200112L || _ISOC99_SOURCE

rint():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    || _XOPEN_SOURCE >= 500
    || /* Since glibc 2.19: */ _DEFAULT_SOURCE
    || /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE

rintf(), rintl():
    _ISOC99_SOURCE || _POSIX_C_SOURCE >= 200112L
    || /* Since glibc 2.19: */ _DEFAULT_SOURCE
    || /* glibc <= 2.19: */ _BSD_SOURCE || _SVID_SOURCE
```

DESCRIPTION

The **nearbyint()**, **nearbyintf()**, and **nearbyintl()** functions round their argument to an integer value in floating-point format, using the current rounding direction (see **fesetround(3)**) and without raising the *inexact* exception. When the current rounding direction is to nearest, these functions round halfway cases to the even integer in accordance with IEEE-754.

The **rint()**, **rintf()**, and **rintl()** functions do the same, but will raise the *inexact* exception (**FE_INEXACT**, checkable via **fetestexcept(3)**) when the result differs in value from the argument.

RETURN VALUE

These functions return the rounded integer value.

If *x* is integral, +0, −0, NaN, or infinite, *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
nearbyint() , nearbyintf() , nearbyintl() , rint() , rintf() , rintl()	Thread safety	MT-Safe

STANDARDS

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

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 127 (respectively, 1023), and the number of mantissa bits including the implicit bit is 24 (respectively, 53).)

If you want to store the rounded value in an integer type, you probably want to use one of the functions described in **lrint(3)** instead.

SEE ALSO

ceil(3), **floor(3)**, **lrint(3)**, **round(3)**, **trunc(3)**