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Red Hat Enterprise Linux Release 9.2 Manual Pages on 'logb.3p' command

\$ man logb.3p

LOGB(3P) POSIX Programmer's Manual LOGB(3P)

PROLOG

This manual page is part of the POSIX Programmer's Manual. The Linux implementation of this interface may differ (consult the corresponding Linux manual page for details of Linux behavior), or the interface may not be implemented on Linux.

NAME

logb, logbf, logbl ? radix-independent exponent

SYNOPSIS

```
#include <math.h>

double logb(double x);

float logbf(float x);

long double logbl(long double x);
```

DESCRIPTION

The functionality described on this reference page is aligned with the ISO C standard. Any conflict between the requirements described here and the ISO C standard is unintentional. This volume of POSIX.1?2017 defers to the ISO C standard.

These functions shall compute the exponent of x , which is the integral part of $\log_r |x|$, as a signed floating-point value, for non-zero x , where r is the radix of the machine's floating-point arithmetic, which is the value of `FLT_RADIX` defined in the `<float.h>` header.

If x is subnormal it is treated as though it were normalized; thus for

finite positive x:

$$1 \leq x * FLT_RADIX - \log_b(x) < FLT_RADIX$$

An application wishing to check for error situations should set `errno` to zero and call `feclearexcept(FE_ALL_EXCEPT)` before calling these functions. On return, if `errno` is non-zero or `fetestexcept(FE_INVALID | FE_DIVBYZERO | FE_OVERFLOW | FE_UNDERFLOW)` is non-zero, an error has occurred.

RETURN VALUE

Upon successful completion, these functions shall return the exponent of x.

If x is ?0, `logb()`, `logbf()`, and `logbl()` shall return `-HUGE_VAL`, `-HUGE_VALF`, and `-HUGE_VALL`, respectively.

On systems that support the IEC 60559 Floating-Point option, a pole error shall occur;

otherwise, a pole error may occur.

If x is NaN, a NaN shall be returned.

If x is ?Inf, +Inf shall be returned.

ERRORS

These functions shall fail if:

Pole Error The value of x is ?0.

If the integer expression `(math_errhandling & MATH_ERRNO)` is non-zero, then `errno` shall be set to `[ERANGE]`. If the integer expression `(math_errhandling & MATH_ERREXCEPT)` is non-zero, then the divide-by-zero floating-point exception shall be raised.

These functions may fail if:

Pole Error The value of x is 0.

If the integer expression `(math_errhandling & MATH_ERRNO)` is non-zero, then `errno` shall be set to `[ERANGE]`. If the integer expression `(math_errhandling & MATH_ERREXCEPT)` is non-zero, then the divide-by-zero floating-point exception shall be raised.

The following sections are informative.

EXAMPLES

None.

APPLICATION USAGE

On error, the expressions (`math_errhandling` & `MATH_ERRNO`) and (`math_errhandling` & `MATH_ERREXCEPT`) are independent of each other, but at least one of them must be non-zero.

RATIONALE

None.

FUTURE DIRECTIONS

None.

SEE ALSO

`feclearexcept()`, `fetestexcept()`, `ilogb()`, `scalbn()`

The Base Definitions volume of POSIX.1-2017, Section 4.20, Treatment of Error Conditions for Mathematical Functions, `<float.h>`, `<math.h>`

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