

## NAME

POSIX - Perl interface to IEEE Std 1003.1

## SYNOPSIS

```
use POSIX;
use POSIX qw(setsid);
use POSIX qw(:errno_h :fcntl_h);

printf "EINTR is %d\n", EINTR;

$sess_id = POSIX::setsid();

$fd = POSIX::open($path, O_CREAT|O_EXCL|O_WRONLY, 0644);
# note: that's a filedescriptor, *NOT* a filehandle
```

## DESCRIPTION

The POSIX module permits you to access all (or nearly all) the standard POSIX 1003.1 identifiers. Many of these identifiers have been given Perl-ish interfaces.

*Everything is exported by default* with the exception of any POSIX functions with the same name as a built-in Perl function, such as `abs`, `alarm`, `rmdir`, `write`, etc., which will be exported only if you ask for them explicitly. This is an unfortunate backwards compatibility feature. You can stop the exporting by saying `use POSIX ()` and then use the fully qualified names (ie. `POSIX::SEEK_END`).

This document gives a condensed list of the features available in the POSIX module. Consult your operating system's manpages for general information on most features. Consult *perlfunc* for functions which are noted as being identical to Perl's builtin functions.

The first section describes POSIX functions from the 1003.1 specification. The second section describes some classes for signal objects, TTY objects, and other miscellaneous objects. The remaining sections list various constants and macros in an organization which roughly follows IEEE Std 1003.1b-1993.

## NOTE

The POSIX module is probably the most complex Perl module supplied with the standard distribution. It incorporates autoloading, namespace games, and dynamic loading of code that's in Perl, C, or both. It's a great source of wisdom.

## CAVEATS

A few functions are not implemented because they are C specific. If you attempt to call these, they will print a message telling you that they aren't implemented, and suggest using the Perl equivalent should one exist. For example, trying to access the `setjmp()` call will elicit the message "setjmp() is C-specific: use `eval {}` instead".

Furthermore, some evil vendors will claim 1003.1 compliance, but in fact are not so: they will not pass the PCTS (POSIX Compliance Test Suites). For example, one vendor may not define `EDEADLK`, or the semantics of the `errno` values set by `open(2)` might not be quite right. Perl does not attempt to verify POSIX compliance. That means you can currently successfully say "use POSIX", and then later in your program you find that your vendor has been lax and there's no usable `ICANON` macro after all. This could be construed to be a bug.

## FUNCTIONS

`_exit`

This is identical to the C function `_exit()`. It exits the program immediately which means among other things buffered I/O is **not** flushed.

Note that when using threads and in Linux this is **not** a good way to exit a thread because in Linux processes and threads are kind of the same thing (Note: while this is the situation in early 2003 there are projects under way to have threads with more POSIXly semantics in Linux). If you want not to return from a thread, detach the thread.

#### abort

This is identical to the C function `abort()`. It terminates the process with a `SIGABRT` signal unless caught by a signal handler or if the handler does not return normally (it e.g. does a `longjmp`).

#### abs

This is identical to Perl's builtin `abs()` function, returning the absolute value of its numerical argument.

#### access

Determines the accessibility of a file.

```
if( POSIX::access( "/", &POSIX::R_OK ) ){
    print "have read permission\n";
}
```

Returns `undef` on failure. Note: do not use `access()` for security purposes. Between the `access()` call and the operation you are preparing for the permissions might change: a classic *race condition*.

#### acos

This is identical to the C function `acos()`, returning the arcus cosine of its numerical argument. See also *Math::Trig*.

#### alarm

This is identical to Perl's builtin `alarm()` function, either for arming or disarming the `SIGALRM` timer.

#### asctime

This is identical to the C function `asctime()`. It returns a string of the form

```
"Fri Jun  2 18:22:13 2000\n\0"
```

and it is called thusly

```
$asctime = asctime($sec, $min, $hour, $mday, $mon, $year,
                  $wday, $yday, $isdst);
```

The `$mon` is zero-based: January equals 0. The `$year` is 1900-based: 2001 equals 101. The `$wday`, `$yday`, and `$isdst` default to zero (and the first two are usually ignored anyway).

#### asin

This is identical to the C function `asin()`, returning the arcus sine of its numerical argument. See also *Math::Trig*.

#### assert

Unimplemented, but you can use *"die" in perlfunc* and the *Carp* module to achieve similar things.

#### atan

This is identical to the C function `atan()`, returning the arcus tangent of its numerical

argument. See also *Math::Trig*.

atan2

This is identical to Perl's builtin `atan2()` function, returning the arcus tangent defined by its two numerical arguments, the *y* coordinate and the *x* coordinate. See also *Math::Trig*.

atexit

`atexit()` is C-specific: use `END {}` instead, see *perlsub*.

atof

`atof()` is C-specific. Perl converts strings to numbers transparently. If you need to force a scalar to a number, add a zero to it.

atoi

`atoi()` is C-specific. Perl converts strings to numbers transparently. If you need to force a scalar to a number, add a zero to it. If you need to have just the integer part, see "*int*" in *perlfunc*.

atol

`atol()` is C-specific. Perl converts strings to numbers transparently. If you need to force a scalar to a number, add a zero to it. If you need to have just the integer part, see "*int*" in *perlfunc*.

bsearch

`bsearch()` not supplied. For doing binary search on wordlists, see *Search::Dict*.

calloc

`calloc()` is C-specific. Perl does memory management transparently.

ceil

This is identical to the C function `ceil()`, returning the smallest integer value greater than or equal to the given numerical argument.

chdir

This is identical to Perl's builtin `chdir()` function, allowing one to change the working (default) directory, see "*chdir*" in *perlfunc*.

chmod

This is identical to Perl's builtin `chmod()` function, allowing one to change file and directory permissions, see "*chmod*" in *perlfunc*.

chown

This is identical to Perl's builtin `chown()` function, allowing one to change file and directory owners and groups, see "*chown*" in *perlfunc*.

clearerr

Use the method `IO::Handle::clearerr()` instead, to reset the error state (if any) and EOF state (if any) of the given stream.

clock

This is identical to the C function `clock()`, returning the amount of spent processor time in microseconds.

close

Close the file. This uses file descriptors such as those obtained by calling

POSIX::open.

```
$fd = POSIX::open( "foo", &POSIX::O_RDONLY );
POSIX::close( $fd );
```

Returns undef on failure.

See also *"close" in perlfunc*.

#### closedir

This is identical to Perl's builtin `closedir()` function for closing a directory handle, see *"closedir" in perlfunc*.

#### cos

This is identical to Perl's builtin `cos()` function, for returning the cosine of its numerical argument, see *"cos" in perlfunc*. See also *Math::Trig*.

#### cosh

This is identical to the C function `cosh()`, for returning the hyperbolic cosine of its numeric argument. See also *Math::Trig*.

#### creat

Create a new file. This returns a file descriptor like the ones returned by `POSIX::open`. Use `POSIX::close` to close the file.

```
$fd = POSIX::creat( "foo", 0611 );
POSIX::close( $fd );
```

See also *"sysopen" in perlfunc* and its `O_CREAT` flag.

#### ctermid

Generates the path name for the controlling terminal.

```
$path = POSIX::ctermid();
```

#### ctime

This is identical to the C function `ctime()` and equivalent to `asctime(localtime(...))`, see *asctime* and *localtime*.

#### cuserid

Get the login name of the owner of the current process.

```
$name = POSIX::cuserid();
```

#### difftime

This is identical to the C function `difftime()`, for returning the time difference (in seconds) between two times (as returned by `time()`), see *time*.

#### div

`div()` is C-specific, use *"int" in perlfunc* on the usual / division and the modulus %.

#### dup

This is similar to the C function `dup()`, for duplicating a file descriptor.

This uses file descriptors such as those obtained by calling `POSIX::open`.

Returns undef on failure.

#### dup2

This is similar to the C function `dup2()`, for duplicating a file descriptor to an another known file descriptor.

This uses file descriptors such as those obtained by calling `POSIX::open`.

Returns `undef` on failure.

`errno`

Returns the value of `errno`.

```
$errno = POSIX::errno();
```

This identical to the numerical values of the `$!`, see "*\$ERRNO*" in *perlvar*.

`execl`

`execl()` is C-specific, see "*exec*" in *perlfunc*.

`execle`

`execle()` is C-specific, see "*exec*" in *perlfunc*.

`execlp`

`execlp()` is C-specific, see "*exec*" in *perlfunc*.

`execv`

`execv()` is C-specific, see "*exec*" in *perlfunc*.

`execve`

`execve()` is C-specific, see "*exec*" in *perlfunc*.

`execvp`

`execvp()` is C-specific, see "*exec*" in *perlfunc*.

`exit`

This is identical to Perl's builtin `exit()` function for exiting the program, see "*exit*" in *perlfunc*.

`exp`

This is identical to Perl's builtin `exp()` function for returning the exponent (*e*-based) of the numerical argument, see "*exp*" in *perlfunc*.

`fabs`

This is identical to Perl's builtin `abs()` function for returning the absolute value of the numerical argument, see "*abs*" in *perlfunc*.

`fclose`

Use method `IO::Handle::close()` instead, or see "*close*" in *perlfunc*.

`fcntl`

This is identical to Perl's builtin `fcntl()` function, see "*fcntl*" in *perlfunc*.

`fdopen`

Use method `IO::Handle::new_from_fd()` instead, or see "*open*" in *perlfunc*.

`feof`

Use method `IO::Handle::eof()` instead, or see "*eof*" in *perlfunc*.

`ferror`

Use method `IO::Handle::error()` instead.

fflush	Use method <code>IO::Handle::flush()</code> instead. See also <code>"\$OUTPUT_AUTOFLUSH"</code> in <i>perlvar</i> .
fgetc	Use method <code>IO::Handle::getc()</code> instead, or see <i>"read" in perlfunc</i> .
fgetpos	Use method <code>IO::Seekable::getpos()</code> instead, or see <i>"seek" in L</i> .
fgets	Use method <code>IO::Handle::gets()</code> instead. Similar to <code>&lt;&gt;</code> , also known as <i>"readline" in perlfunc</i> .
fileno	Use method <code>IO::Handle::fileno()</code> instead, or see <i>"fileno" in perlfunc</i> .
floor	This is identical to the C function <code>floor()</code> , returning the largest integer value less than or equal to the numerical argument.
fmod	This is identical to the C function <code>fmod()</code> . <pre>\$r = fmod(\$x, \$y);</pre> <p>It returns the remainder <math>\\$r = \\$x - \\$n * \\$y</math>, where <math>\\$n = \text{trunc}(\\$x / \\$y)</math>. The <math>\\$r</math> has the same sign as <math>\\$x</math> and magnitude (absolute value) less than the magnitude of <math>\\$y</math>.</p>
fopen	Use method <code>IO::File::open()</code> instead, or see <i>"open" in perlfunc</i> .
fork	This is identical to Perl's builtin <code>fork()</code> function for duplicating the current process, see <i>"fork" in perlfunc</i> and <i>perlfork</i> if you are in Windows.
fpathconf	Retrieves the value of a configurable limit on a file or directory. This uses file descriptors such as those obtained by calling <code>POSIX::open</code> . The following will determine the maximum length of the longest allowable pathname on the filesystem which holds <code>/var/foo</code> . <pre>\$fd = POSIX::open( "/var/foo", &amp;POSIX::O_RDONLY ); \$path_max = POSIX::fpathconf( \$fd, &amp;POSIX::_PC_PATH_MAX );</pre> <p>Returns <code>undef</code> on failure.</p>
fprintf	<code>fprintf()</code> is C-specific, see <i>"printf" in perlfunc</i> instead.
fputc	<code>fputc()</code> is C-specific, see <i>"print" in perlfunc</i> instead.
fputs	<code>fputs()</code> is C-specific, see <i>"print" in perlfunc</i> instead.

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<code>fread</code>	<code>fread()</code> is C-specific, see <i>"read" in perlfunc</i> instead.
<code>free</code>	<code>free()</code> is C-specific. Perl does memory management transparently.
<code>freopen</code>	<code>freopen()</code> is C-specific, see <i>"open" in perlfunc</i> instead.
<code>frexp</code>	Return the mantissa and exponent of a floating-point number. <pre>( \$mantissa, \$exponent ) = POSIX::frexp( 1.234e56 );</pre>
<code>fscanf</code>	<code>fscanf()</code> is C-specific, use <code>&lt;&gt;</code> and regular expressions instead.
<code>fseek</code>	Use method <code>IO::Seekable::seek()</code> instead, or see <i>"seek" in perlfunc</i> .
<code>fsetpos</code>	Use method <code>IO::Seekable::setpos()</code> instead, or see <i>"seek" in perlfunc</i> .
<code>fstat</code>	Get file status. This uses file descriptors such as those obtained by calling <code>POSIX::open</code> . The data returned is identical to the data from Perl's builtin <code>stat</code> function. <pre>\$fd = POSIX::open( "foo", &amp;POSIX::O_RDONLY ); @stats = POSIX::fstat( \$fd );</pre>
<code>fsync</code>	Use method <code>IO::Handle::sync()</code> instead.
<code>ftell</code>	Use method <code>IO::Seekable::tell()</code> instead, or see <i>"tell" in perlfunc</i> .
<code>fwrite</code>	<code>fwrite()</code> is C-specific, see <i>"print" in perlfunc</i> instead.
<code>getc</code>	This is identical to Perl's builtin <code>getc()</code> function, see <i>"getc" in perlfunc</i> .
<code>getchar</code>	Returns one character from STDIN. Identical to Perl's <code>getc()</code> , see <i>"getc" in perlfunc</i> .
<code>getcwd</code>	Returns the name of the current working directory. See also <code>Cwd</code> .
<code>getegid</code>	Returns the effective group identifier. Similar to Perl's builtin variable <code>\$()</code> , see <i>"\$EGID" in perlvar</i> .
<code>getenv</code>	Returns the value of the specified environment variable. The same information is available through the <code>%ENV</code> array.

geteuid	Returns the effective user identifier. Identical to Perl's builtin <code>\$&gt;</code> variable, see " <i>\$EUID</i> " in <i>perlvar</i> .
getgid	Returns the user's real group identifier. Similar to Perl's builtin variable <code>\$)</code> , see " <i>\$GID</i> " in <i>perlvar</i> .
getgrgid	This is identical to Perl's builtin <code>getgrgid()</code> function for returning group entries by group identifiers, see " <i>getgrgid</i> " in <i>perlfunc</i> .
getgrnam	This is identical to Perl's builtin <code>getgrnam()</code> function for returning group entries by group names, see " <i>getgrnam</i> " in <i>perlfunc</i> .
getgroups	Returns the ids of the user's supplementary groups. Similar to Perl's builtin variable <code>\$)</code> , see " <i>\$GID</i> " in <i>perlvar</i> .
getlogin	This is identical to Perl's builtin <code>getlogin()</code> function for returning the user name associated with the current session, see " <i>getlogin</i> " in <i>perlfunc</i> .
getpgrp	This is identical to Perl's builtin <code>getpgrp()</code> function for returning the process group identifier of the current process, see " <i>getpgrp</i> " in <i>perlfunc</i> .
getpid	Returns the process identifier. Identical to Perl's builtin variable <code>\$\$</code> , see " <i>\$PID</i> " in <i>perlvar</i> .
getppid	This is identical to Perl's builtin <code>getppid()</code> function for returning the process identifier of the parent process of the current process, see " <i>getppid</i> " in <i>perlfunc</i> .
getpwnam	This is identical to Perl's builtin <code>getpwnam()</code> function for returning user entries by user names, see " <i>getpwnam</i> " in <i>perlfunc</i> .
getpwuid	This is identical to Perl's builtin <code>getpwuid()</code> function for returning user entries by user identifiers, see " <i>getpwuid</i> " in <i>perlfunc</i> .
gets	Returns one line from <code>STDIN</code> , similar to <code>&lt;&gt;</code> , also known as the <code>readline()</code> function, see " <i>readline</i> " in <i>perlfunc</i> . <b>NOTE:</b> if you have C programs that still use <code>gets()</code> , be very afraid. The <code>gets()</code> function is a source of endless grief because it has no buffer overrun checks. It should <b>never</b> be used. The <code>fgets()</code> function should be preferred instead.
getuid	Returns the user's identifier. Identical to Perl's builtin <code>\$&lt;</code> variable, see " <i>\$UID</i> " in <i>perlvar</i> .
gmtime	

This is identical to Perl's builtin `gmtime()` function for converting seconds since the epoch to a date in Greenwich Mean Time, see *"gmtime" in perlfunc*.

#### isalnum

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isalnum`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:alnum:]]/` construct instead, or possibly the `/\w/` construct.

#### isalpha

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isalpha`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:alpha:]]/` construct instead.

#### isatty

Returns a boolean indicating whether the specified filehandle is connected to a tty. Similar to the `-t` operator, see *"-X" in perlfunc*.

#### isctrnl

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isctrnl`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:cntrl:]]/` construct instead.

#### isdigit

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isdigit` (unlikely, but still possible). Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:digit:]]/` construct instead, or the `/\d/` construct.

#### isgraph

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isgraph`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:graph:]]/` construct instead.

#### islower

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `islower`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:lower:]]/` construct instead. Do **not** use `/[a-z]/`.

#### isprint

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isprint`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:print:]]/` construct instead.

#### ispunct

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `ispunct`. Does not work on Unicode characters code point 256 or higher. Consider

using regular expressions and the `/[[:punct:]]/` construct instead.

#### isspace

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isspace`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:space:]]/` construct instead, or the `/\s/` construct. (Note that `/\s/` and `/[[:space:]]/` are slightly different in that `/[[:space:]]/` can normally match a vertical tab, while `/\s/` does not.)

#### isupper

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isupper`. Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:upper:]]/` construct instead. Do **not** use `/[A-Z]/`.

#### isxdigit

This is identical to the C function, except that it can apply to a single character or to a whole string. Note that locale settings may affect what characters are considered `isxdigit` (unlikely, but still possible). Does not work on Unicode characters code point 256 or higher. Consider using regular expressions and the `/[[:xdigit:]]/` construct instead, or simply `/[0-9a-f]/i`.

#### kill

This is identical to Perl's builtin `kill()` function for sending signals to processes (often to terminate them), see *"kill" in perlfunc*.

#### labs

(For returning absolute values of long integers.) `labs()` is C-specific, see *"abs" in perlfunc* instead.

#### ldexp

This is identical to the C function `ldexp()` for multiplying floating point numbers with powers of two.

```
$x_quadrupled = POSIX::ldexp($x, 2);
```

#### ldiv

(For computing dividends of long integers.) `ldiv()` is C-specific, use `/` and `int()` instead.

#### link

This is identical to Perl's builtin `link()` function for creating hard links into files, see *"link" in perlfunc*.

#### localeconv

Get numeric formatting information. Returns a reference to a hash containing the current locale formatting values.

Here is how to query the database for the **de** (Deutsch or German) locale.

```
$loc = POSIX::setlocale( &POSIX::LC_ALL, "de" );
print "Locale = $loc\n";
$lconv = POSIX::localeconv();
print "decimal_point = ", $lconv->{decimal_point}, "\n";
print "thousands_sep = ", $lconv->{thousands_sep}, "\n";
```

```

print "grouping = ", $lconv->{grouping}, "\n";
print "int_curr_symbol = ", $lconv->{int_curr_symbol}, "\n";
print "currency_symbol = ", $lconv->{currency_symbol}, "\n";
print "mon_decimal_point = ", $lconv->{mon_decimal_point},
"\n";
print "mon_thousands_sep = ", $lconv->{mon_thousands_sep},
"\n";
print "mon_grouping = ", $lconv->{mon_grouping}, "\n";
print "positive_sign = ", $lconv->{positive_sign}, "\n";
print "negative_sign = ", $lconv->{negative_sign}, "\n";
print "int_frac_digits = ", $lconv->{int_frac_digits}, "\n";
print "frac_digits = ", $lconv->{frac_digits}, "\n";
print "p_cs_precedes = ", $lconv->{p_cs_precedes}, "\n";
print "p_sep_by_space = ", $lconv->{p_sep_by_space}, "\n";
print "n_cs_precedes = ", $lconv->{n_cs_precedes}, "\n";
print "n_sep_by_space = ", $lconv->{n_sep_by_space}, "\n";
print "p_sign_posn = ", $lconv->{p_sign_posn}, "\n";
print "n_sign_posn = ", $lconv->{n_sign_posn}, "\n";

```

### localtime

This is identical to Perl's builtin `localtime()` function for converting seconds since the epoch to a date see *"localtime" in perlfunc*.

### log

This is identical to Perl's builtin `log()` function, returning the natural (*e*-based) logarithm of the numerical argument, see *"log" in perlfunc*.

### log10

This is identical to the C function `log10()`, returning the 10-base logarithm of the numerical argument. You can also use

```
sub log10 { log($_[0]) / log(10) }
```

or

```
sub log10 { log($_[0]) / 2.30258509299405 }
```

or

```
sub log10 { log($_[0]) * 0.434294481903252 }
```

### longjmp

`longjmp()` is C-specific: use *"die" in perlfunc* instead.

### lseek

Move the file's read/write position. This uses file descriptors such as those obtained by calling `POSIX::open`.

```

$fd = POSIX::open( "foo", &POSIX::O_RDONLY );
$off_t = POSIX::lseek( $fd, 0, &POSIX::SEEK_SET );

```

Returns `undef` on failure.

### malloc

`malloc()` is C-specific. Perl does memory management transparently.

### mblen

This is identical to the C function `mblen()`. Perl does not have any support for the wide and multibyte characters of the C standards, so this might be a rather useless function.

#### `mbstowcs`

This is identical to the C function `mbstowcs()`. Perl does not have any support for the wide and multibyte characters of the C standards, so this might be a rather useless function.

#### `mbtowc`

This is identical to the C function `mbtowc()`. Perl does not have any support for the wide and multibyte characters of the C standards, so this might be a rather useless function.

#### `memchr`

`memchr()` is C-specific, see *"index" in perlfunc* instead.

#### `memcmp`

`memcmp()` is C-specific, use `eq` instead, see *perlop*.

#### `memcpy`

`memcpy()` is C-specific, use `=`, see *perlop*, or see *"substr" in perlfunc*.

#### `memmove`

`memmove()` is C-specific, use `=`, see *perlop*, or see *"substr" in perlfunc*.

#### `memset`

`memset()` is C-specific, use `x` instead, see *perlop*.

#### `mkdir`

This is identical to Perl's builtin `mkdir()` function for creating directories, see *"mkdir" in perlfunc*.

#### `mkfifo`

This is similar to the C function `mkfifo()` for creating FIFO special files.

```
if (mkfifo($path, $mode)) { ....
```

Returns `undef` on failure. The `$mode` is similar to the mode of `mkdir()`, see *"mkdir" in perlfunc*.

#### `mktime`

Convert date/time info to a calendar time.

Synopsis:

```
mktime(sec, min, hour, mday, mon, year, wday = 0, yday = 0,
isdst = 0)
```

The month (`mon`), weekday (`wday`), and yearday (`yday`) begin at zero. I.e. January is 0, not 1; Sunday is 0, not 1; January 1st is 0, not 1. The year (`year`) is given in years since 1900. I.e. The year 1995 is 95; the year 2001 is 101. Consult your system's `mktime()` manpage for details about these and the other arguments.

Calendar time for December 12, 1995, at 10:30 am.

```
$time_t = POSIX::mktime( 0, 30, 10, 12, 11, 95 );
print "Date = ", POSIX::ctime($time_t);
```

Returns undef on failure.

#### modf

Return the integral and fractional parts of a floating-point number.

```
($fractional, $integral) = POSIX::modf( 3.14 );
```

#### nice

This is similar to the C function `nice()`, for changing the scheduling preference of the current process. Positive arguments mean more polite process, negative values more needy process. Normal user processes can only be more polite.

Returns undef on failure.

#### offsetof

`offsetof()` is C-specific, you probably want to see *"pack" in perlfunc* instead.

#### open

Open a file for reading for writing. This returns file descriptors, not Perl filehandles. Use `POSIX::close` to close the file.

Open a file read-only with mode 0666.

```
$fd = POSIX::open( "foo" );
```

Open a file for read and write.

```
$fd = POSIX::open( "foo", &POSIX::O_RDWR );
```

Open a file for write, with truncation.

```
$fd = POSIX::open( "foo", &POSIX::O_WRONLY | &POSIX::O_TRUNC );
```

Create a new file with mode 0640. Set up the file for writing.

```
$fd = POSIX::open( "foo", &POSIX::O_CREAT | &POSIX::O_WRONLY,  
0640 );
```

Returns undef on failure.

See also *"sysopen" in perlfunc*.

#### opendir

Open a directory for reading.

```
$dir = POSIX::opendir( "/var" );  
@files = POSIX::readdir( $dir );  
POSIX::closedir( $dir );
```

Returns undef on failure.

#### pathconf

Retrieves the value of a configurable limit on a file or directory.

The following will determine the maximum length of the longest allowable pathname on the filesystem which holds `/var`.

```
$path_max = POSIX::pathconf( "/var", &POSIX::_PC_PATH_MAX );
```

Returns undef on failure.

#### pause

This is similar to the C function `pause()`, which suspends the execution of the current

process until a signal is received.

Returns `undef` on failure.

#### perror

This is identical to the C function `perror()`, which outputs to the standard error stream the specified message followed by `": "` and the current error string. Use the `warn()` function and the `$!` variable instead, see *"warn" in perlfunc* and *"\$ERRNO" in perlvar*.

#### pipe

Create an interprocess channel. This returns file descriptors like those returned by `POSIX::open`.

```
my ($read, $write) = POSIX::pipe();
POSIX::write( $write, "hello", 5 );
POSIX::read( $read, $buf, 5 );
```

See also *"pipe" in perlfunc*.

#### pow

Computes `$x` raised to the power `$exponent`.

```
$ret = POSIX::pow( $x, $exponent );
```

You can also use the `**` operator, see *perlop*.

#### printf

Formats and prints the specified arguments to `STDOUT`. See also *"printf" in perlfunc*.

#### putc

`putc()` is C-specific, see *"print" in perlfunc* instead.

#### putchar

`putchar()` is C-specific, see *"print" in perlfunc* instead.

#### puts

`puts()` is C-specific, see *"print" in perlfunc* instead.

#### qsort

`qsort()` is C-specific, see *"sort" in perlfunc* instead.

#### raise

Sends the specified signal to the current process. See also *"kill" in perlfunc* and the `$$` in *"\$PID" in perlvar*.

#### rand

`rand()` is non-portable, see *"rand" in perlfunc* instead.

#### read

Read from a file. This uses file descriptors such as those obtained by calling `POSIX::open`. If the buffer `$buf` is not large enough for the read then Perl will extend it to make room for the request.

```
$fd = POSIX::open( "foo", &POSIX::O_RDONLY );
$bytes = POSIX::read( $fd, $buf, 3 );
```

Returns `undef` on failure.

See also *"sysread" in perlfunc*.

readdir

This is identical to Perl's builtin `readdir()` function for reading directory entries, see *"readdir" in perlfunc*.

realloc

`realloc()` is C-specific. Perl does memory management transparently.

remove

This is identical to Perl's builtin `unlink()` function for removing files, see *"unlink" in perlfunc*.

rename

This is identical to Perl's builtin `rename()` function for renaming files, see *"rename" in perlfunc*.

rewind

Seeks to the beginning of the file.

rewinddir

This is identical to Perl's builtin `rewinddir()` function for rewinding directory entry streams, see *"rewinddir" in perlfunc*.

rmdir

This is identical to Perl's builtin `rmdir()` function for removing (empty) directories, see *"rmdir" in perlfunc*.

scanf

`scanf()` is C-specific, use `<>` and regular expressions instead, see *perlre*.

setgid

Sets the real group identifier and the effective group identifier for this process. Similar to assigning a value to the Perl's builtin `$)` variable, see *"\$GID" in perlvar*, except that the latter will change only the real user identifier, and that the `setgid()` uses only a single numeric argument, as opposed to a space-separated list of numbers.

setjmp

`setjmp()` is C-specific: use `eval {}` instead, see *"eval" in perlfunc*.

setlocale

Modifies and queries program's locale. The following examples assume

```
use POSIX qw(setlocale LC_ALL LC_CTYPE);
```

has been issued.

The following will set the traditional UNIX system locale behavior (the second argument "C").

```
$loc = setlocale( LC_ALL, "C" );
```

The following will query the current LC\_CTYPE category. (No second argument means 'query'.)

```
$loc = setlocale( LC_CTYPE );
```

The following will set the LC\_CTYPE behaviour according to the locale environment variables (the second argument ""). Please see your systems `setlocale(3)`

documentation for the locale environment variables' meaning or consult *perllocale*.

```
$loc = setlocale( LC_CTYPE, "" );
```

The following will set the LC\_COLLATE behaviour to Argentinian Spanish. **NOTE:** The naming and availability of locales depends on your operating system. Please consult *perllocale* for how to find out which locales are available in your system.

```
$loc = setlocale( LC_ALL, "es_AR.ISO8859-1" );
```

### setpgid

This is similar to the C function `setpgid()` for setting the process group identifier of the current process.

Returns `undef` on failure.

### setsid

This is identical to the C function `setsid()` for setting the session identifier of the current process.

### setuid

Sets the real user identifier and the effective user identifier for this process. Similar to assigning a value to the Perl's builtin `$<` variable, see "*\$UID*" in *perlvar*, except that the latter will change only the real user identifier.

### sigaction

Detailed signal management. This uses `POSIX::SigAction` objects for the `action` and `oldaction` arguments. Consult your system's `sigaction` manpage for details.

Synopsis:

```
sigaction(signal, action, oldaction = 0)
```

Returns `undef` on failure. The `signal` must be a number (like `SIGHUP`), not a string (like `"SIGHUP"`), though Perl does try hard to understand you.

### siglongjmp

`siglongjmp()` is C-specific: use "*die*" in *perlfunc* instead.

### sigpending

Examine signals that are blocked and pending. This uses `POSIX::SigSet` objects for the `sigset` argument. Consult your system's `sigpending` manpage for details.

Synopsis:

```
sigpending(sigset)
```

Returns `undef` on failure.

### sigprocmask

Change and/or examine calling process's signal mask. This uses `POSIX::SigSet` objects for the `sigset` and `oldsigset` arguments. Consult your system's `sigprocmask` manpage for details.

Synopsis:

```
sigprocmask(how, sigset, oldsigset = 0)
```

Returns `undef` on failure.

### sigsetjmp

`sigsetjmp()` is C-specific: use `eval {}` instead, see *"eval" in perlfunc*.

### `sigsuspend`

Install a signal mask and suspend process until signal arrives. This uses `POSIX::SigSet` objects for the `signal_mask` argument. Consult your system's `sigsuspend` manpage for details.

Synopsis:

```
sigsuspend(signal_mask)
```

Returns `undef` on failure.

### `sin`

This is identical to Perl's builtin `sin()` function for returning the sine of the numerical argument, see *"sin" in perlfunc*. See also *Math::Trig*.

### `sinh`

This is identical to the C function `sinh()` for returning the hyperbolic sine of the numerical argument. See also *Math::Trig*.

### `sleep`

This is functionally identical to Perl's builtin `sleep()` function for suspending the execution of the current for process for certain number of seconds, see *"sleep" in perlfunc*. There is one significant difference, however: `POSIX::sleep()` returns the number of **unslept** seconds, while the `CORE::sleep()` returns the number of slept seconds.

### `sprintf`

This is similar to Perl's builtin `sprintf()` function for returning a string that has the arguments formatted as requested, see *"sprintf" in perlfunc*.

### `sqrt`

This is identical to Perl's builtin `sqrt()` function. for returning the square root of the numerical argument, see *"sqrt" in perlfunc*.

### `srand`

Give a seed the pseudorandom number generator, see *"srand" in perlfunc*.

### `sscanf`

`sscanf()` is C-specific, use regular expressions instead, see *perlre*.

### `stat`

This is identical to Perl's builtin `stat()` function for returning information about files and directories.

### `strcat`

`strcat()` is C-specific, use `. =` instead, see *perlop*.

### `strchr`

`strchr()` is C-specific, see *"index" in perlfunc* instead.

### `strcmp`

`strcmp()` is C-specific, use `eq` or `cmp` instead, see *perlop*.

### `strcoll`

This is identical to the C function `strcoll()` for collating (comparing) strings

transformed using the `strxfrm()` function. Not really needed since Perl can do this transparently, see *perllocale*.

#### strcpy

`strcpy()` is C-specific, use `=` instead, see *perlop*.

#### strcspn

`strcspn()` is C-specific, use regular expressions instead, see *perlre*.

#### strerror

Returns the error string for the specified `errno`. Identical to the string form of the `$!`, see *"\$ERRNO" in perlvar*.

#### strftime

Convert date and time information to string. Returns the string.

Synopsis:

```
strftime(fmt, sec, min, hour, mday, mon, year, wday = -1, yday
= -1, isdst = -1)
```

The month (`mon`), weekday (`wday`), and yearday (`yday`) begin at zero. I.e. January is 0, not 1; Sunday is 0, not 1; January 1st is 0, not 1. The year (`year`) is given in years since 1900. I.e., the year 1995 is 95; the year 2001 is 101. Consult your system's `strftime()` manpage for details about these and the other arguments.

If you want your code to be portable, your format (`fmt`) argument should use only the conversion specifiers defined by the ANSI C standard (C89, to play safe). These are `aAbBcdHIjmMpSUwWxXyYZ%`. But even then, the **results** of some of the conversion specifiers are non-portable. For example, the specifiers `aAbBcpZ` change according to the locale settings of the user, and both how to set locales (the locale names) and what output to expect are non-standard. The specifier `c` changes according to the timezone settings of the user and the timezone computation rules of the operating system. The `Z` specifier is notoriously unportable since the names of timezones are non-standard. Sticking to the numeric specifiers is the safest route.

The given arguments are made consistent as though by calling `mktime()` before calling your system's `strftime()` function, except that the `isdst` value is not affected.

The string for Tuesday, December 12, 1995.

```
$str = POSIX::strftime( "%A, %B %d, %Y", 0, 0, 0, 12, 11, 95, 2
);
print "$str\n";
```

#### strlen

`strlen()` is C-specific, use `length()` instead, see *"length" in perlfunc*.

#### strncat

`strncat()` is C-specific, use `.` instead, see *perlop*.

#### strncmp

`strncmp()` is C-specific, use `eq` instead, see *perlop*.

#### strncpy

`strncpy()` is C-specific, use `=` instead, see *perlop*.

#### strpbrk

`strpbrk()` is C-specific, use regular expressions instead, see *perlre*.

#### strchr

`strchr()` is C-specific, see *"rindex" in perlfunc* instead.

#### strspn

`strspn()` is C-specific, use regular expressions instead, see *perlre*.

#### strstr

This is identical to Perl's builtin `index()` function, see *"index" in perlfunc*.

#### strtod

String to double translation. Returns the parsed number and the number of characters in the unparsed portion of the string. Truly POSIX-compliant systems set `#!` (`$ERRNO`) to indicate a translation error, so clear `#!` before calling `strtod`. However, non-POSIX systems may not check for overflow, and therefore will never set `#!`.

`strtod` should respect any POSIX *setlocale()* settings.

To parse a string `$str` as a floating point number use

```
#! = 0;
($num, $n_unparsed) = POSIX::strtod($str);
```

The second returned item and `#!` can be used to check for valid input:

```
if (($str eq '') || ($n_unparsed != 0) || $!) {
    die "Non-numeric input $str" . ($! ? ": $!\n" : "\n");
}
```

When called in a scalar context `strtod` returns the parsed number.

#### strtok

`strtok()` is C-specific, use regular expressions instead, see *perlre*, or *"split" in perlfunc*.

#### strtol

String to (long) integer translation. Returns the parsed number and the number of characters in the unparsed portion of the string. Truly POSIX-compliant systems set `#!` (`$ERRNO`) to indicate a translation error, so clear `#!` before calling `strtol`. However, non-POSIX systems may not check for overflow, and therefore will never set `#!`.

`strtol` should respect any POSIX *setlocale()* settings.

To parse a string `$str` as a number in some base `$base` use

```
#! = 0;
($num, $n_unparsed) = POSIX::strtol($str, $base);
```

The base should be zero or between 2 and 36, inclusive. When the base is zero or omitted `strtol` will use the string itself to determine the base: a leading "0x" or "0X" means hexadecimal; a leading "0" means octal; any other leading characters mean decimal. Thus, "1234" is parsed as a decimal number, "01234" as an octal number, and "0x1234" as a hexadecimal number.

The second returned item and `#!` can be used to check for valid input:

```
if (($str eq '') || ($n_unparsed != 0) || !$!) {
    die "Non-numeric input $str" . $! ? ": $!\n" : "\n";
}
```

When called in a scalar context `strtol` returns the parsed number.

## strtoul

String to unsigned (long) integer translation. `strtoul()` is identical to `strtol()` except that `strtoul()` only parses unsigned integers. See *strtol* for details.

Note: Some vendors supply `strtod()` and `strtol()` but not `strtoul()`. Other vendors that do supply `strtoul()` parse "-1" as a valid value.

## strxfrm

String transformation. Returns the transformed string.

```
$dst = POSIX::strxfrm( $src );
```

Used in conjunction with the `strcoll()` function, see *strcoll*.

Not really needed since Perl can do this transparently, see *perllocale*.

## sysconf

Retrieves values of system configurable variables.

The following will get the machine's clock speed.

```
$clock_ticks = POSIX::sysconf( &POSIX::_SC_CLK_TCK );
```

Returns `undef` on failure.

## system

This is identical to Perl's builtin `system()` function, see *"system" in perlfunc*.

## tan

This is identical to the C function `tan()`, returning the tangent of the numerical argument. See also *Math::Trig*.

## tanh

This is identical to the C function `tanh()`, returning the hyperbolic tangent of the numerical argument. See also *Math::Trig*.

## tcdrain

This is similar to the C function `tcdrain()` for draining the output queue of its argument stream.

Returns `undef` on failure.

## tcflow

This is similar to the C function `tcflow()` for controlling the flow of its argument stream.

Returns `undef` on failure.

## tcflush

This is similar to the C function `tcflush()` for flushing the I/O buffers of its argument stream.

Returns `undef` on failure.

## tcgetpgrp

This is identical to the C function `tcgetpgrp()` for returning the process group identifier of the foreground process group of the controlling terminal.

## tcsendbreak

This is similar to the C function `tcsendbreak()` for sending a break on its argument stream.

Returns `undef` on failure.

#### `tcsetpgrp`

This is similar to the C function `tcsetpgrp()` for setting the process group identifier of the foreground process group of the controlling terminal.

Returns `undef` on failure.

#### `time`

This is identical to Perl's builtin `time()` function for returning the number of seconds since the epoch (whatever it is for the system), see *"time" in perlfunc*.

#### `times`

The `times()` function returns elapsed realtime since some point in the past (such as system startup), user and system times for this process, and user and system times used by child processes. All times are returned in clock ticks.

```
($realtime, $user, $system, $cuser, $csystem) =  
POSIX::times();
```

Note: Perl's builtin `times()` function returns four values, measured in seconds.

#### `tmpfile`

Use method `IO::File::new_tmpfile()` instead, or see *File::Temp*.

#### `tmpnam`

Returns a name for a temporary file.

```
$tmpfile = POSIX::tmpnam();
```

For security reasons, which are probably detailed in your system's documentation for the C library `tmpnam()` function, this interface should not be used; instead see *File::Temp*.

#### `tolower`

This is identical to the C function, except that it can apply to a single character or to a whole string. Consider using the `lc()` function, see *"lc" in perlfunc*, or the equivalent `\L` operator inside doublequotish strings.

#### `toupper`

This is identical to the C function, except that it can apply to a single character or to a whole string. Consider using the `uc()` function, see *"uc" in perlfunc*, or the equivalent `\U` operator inside doublequotish strings.

#### `ttyname`

This is identical to the C function `ttyname()` for returning the name of the current terminal.

#### `tzname`

Retrieves the time conversion information from the `tzname` variable.

```
POSIX::tzset();  
($std, $dst) = POSIX::tzname();
```

#### `tzset`

This is identical to the C function `tzset()` for setting the current timezone based on the environment variable `TZ`, to be used by `ctime()`, `localtime()`, `mktime()`, and `strftime()` functions.

## umask

This is identical to Perl's builtin `umask()` function for setting (and querying) the file creation permission mask, see "*umask*" in *perlfunc*.

## uname

Get name of current operating system.

```
($sysname, $nodename, $release, $version, $machine) =  
POSIX::uname();
```

Note that the actual meanings of the various fields are not that well standardized, do not expect any great portability. The `$sysname` might be the name of the operating system, the `$nodename` might be the name of the host, the `$release` might be the (major) release number of the operating system, the `$version` might be the (minor) release number of the operating system, and the `$machine` might be a hardware identifier. Maybe.

## ungetc

Use method `IO::Handle::ungetc()` instead.

## unlink

This is identical to Perl's builtin `unlink()` function for removing files, see "*unlink*" in *perlfunc*.

## utime

This is identical to Perl's builtin `utime()` function for changing the time stamps of files and directories, see "*utime*" in *perlfunc*.

## vfprintf

`vfprintf()` is C-specific, see "*printf*" in *perlfunc* instead.

## vprintf

`vprintf()` is C-specific, see "*printf*" in *perlfunc* instead.

## vsprintf

`vsprintf()` is C-specific, see "*sprintf*" in *perlfunc* instead.

## wait

This is identical to Perl's builtin `wait()` function, see "*wait*" in *perlfunc*.

## waitpid

Wait for a child process to change state. This is identical to Perl's builtin `waitpid()` function, see "*waitpid*" in *perlfunc*.

```
$pid = POSIX::waitpid( -1, POSIX::WNOHANG );  
print "status = ", ($? / 256), "\n";
```

## wcstombs

This is identical to the C function `wcstombs()`. Perl does not have any support for the wide and multibyte characters of the C standards, so this might be a rather useless function.

## wctomb

This is identical to the C function `wctomb()`. Perl does not have any support for the wide and multibyte characters of the C standards, so this might be a rather useless function.

write

Write to a file. This uses file descriptors such as those obtained by calling `POSIX::open`.

```
$fd = POSIX::open( "foo", &POSIX::O_WRONLY );
$buf = "hello";
$bytes = POSIX::write( $b, $buf, 5 );
```

Returns `undef` on failure.

See also *"syswrite" in perlfunc*.

## CLASSES

### POSIX::SigAction

new

Creates a new `POSIX::SigAction` object which corresponds to the C struct `sigaction`. This object will be destroyed automatically when it is no longer needed. The first parameter is the fully-qualified name of a sub which is a signal-handler. The second parameter is a `POSIX::SigSet` object, it defaults to the empty set. The third parameter contains the `sa_flags`, it defaults to 0.

```
$sigset = POSIX::SigSet->new(SIGINT, SIGQUIT);
$sigaction = POSIX::SigAction->new( \&main::handler, $sigset,
&POSIX::SA_NOCLDSTOP );
```

This `POSIX::SigAction` object is intended for use with the `POSIX::sigaction()` function.

handler

mask

flags

accessor functions to get/set the values of a `SigAction` object.

```
$sigset = $sigaction->mask;
$sigaction->flags(&POSIX::SA_RESTART);
```

safe

accessor function for the "safe signals" flag of a `SigAction` object; see *perlipc* for general information on safe (a.k.a. "deferred") signals. If you wish to handle a signal safely, use this accessor to set the "safe" flag in the `POSIX::SigAction` object:

```
$sigaction->safe(1);
```

You may also examine the "safe" flag on the output action object which is filled in when given as the third parameter to `POSIX::sigaction()`:

```
sigaction(SIGINT, $new_action, $old_action);
if ($old_action->safe) {
    # previous SIGINT handler used safe signals
}
```

### POSIX::SigSet

new

Create a new `SigSet` object. This object will be destroyed automatically when it is no longer needed. Arguments may be supplied to initialize the set.

Create an empty set.

```
$sigset = POSIX::SigSet->new;
```

Create a set with SIGUSR1.

```
$sigset = POSIX::SigSet->new( &POSIX::SIGUSR1 );
```

#### addset

Add a signal to a SigSet object.

```
$sigset->addset( &POSIX::SIGUSR2 );
```

Returns undef on failure.

#### delset

Remove a signal from the SigSet object.

```
$sigset->delset( &POSIX::SIGUSR2 );
```

Returns undef on failure.

#### emptyset

Initialize the SigSet object to be empty.

```
$sigset->emptyset();
```

Returns undef on failure.

#### fillset

Initialize the SigSet object to include all signals.

```
$sigset->fillset();
```

Returns undef on failure.

#### ismember

Tests the SigSet object to see if it contains a specific signal.

```
if( $sigset->ismember( &POSIX::SIGUSR1 ) ){  
    print "contains SIGUSR1\n";  
}
```

## POSIX::Termios

#### new

Create a new Termios object. This object will be destroyed automatically when it is no longer needed. A Termios object corresponds to the termios C struct. new() mallocs a new one, getattr() fills it from a file descriptor, and setattr() sets a file descriptor's parameters to match Termios' contents.

```
$termios = POSIX::Termios->new;
```

#### getattr

Get terminal control attributes.

Obtain the attributes for stdin.

```
$termios->getattr();
```

Obtain the attributes for stdout.

```
$termios->getattr( 1 );
```

Returns undef on failure.

#### getc

Retrieve a value from the `c_cc` field of a termios object. The `c_cc` field is an array so an index must be specified.

```
$c_cc[1] = $termios->getc(1);
```

#### getcflag

Retrieve the `c_cflag` field of a termios object.

```
$c_cflag = $termios->getcflag;
```

#### getiflag

Retrieve the `c_iflag` field of a termios object.

```
$c_iflag = $termios->getiflag;
```

#### getispeed

Retrieve the input baud rate.

```
$ispeed = $termios->getispeed;
```

#### getlflag

Retrieve the `c_lflag` field of a termios object.

```
$c_lflag = $termios->getlflag;
```

#### getoflag

Retrieve the `c_oflag` field of a termios object.

```
$c_oflag = $termios->getoflag;
```

#### getospeed

Retrieve the output baud rate.

```
$ospeed = $termios->getospeed;
```

#### setattr

Set terminal control attributes.

Set attributes immediately for stdout.

```
$termios->setattr( 1, &POSIX::TCSANOW );
```

Returns undef on failure.

#### setcc

Set a value in the `c_cc` field of a termios object. The `c_cc` field is an array so an index must be specified.

```
$termios->setcc( &POSIX::VEOF, 1 );
```

#### setcflag

Set the `c_cflag` field of a termios object.

```
$termios->setcflag( $c_cflag | &POSIX::CLOCAL );
```

**setiflag**

Set the `c_iflag` field of a `termios` object.

```
$termios->setiflag( $c_iflag | &POSIX::BRKINT );
```

**setispeed**

Set the input baud rate.

```
$termios->setispeed( &POSIX::B9600 );
```

Returns `undef` on failure.

**setlflag**

Set the `c_lflag` field of a `termios` object.

```
$termios->setlflag( $c_lflag | &POSIX::ECHO );
```

**setoflag**

Set the `c_oflag` field of a `termios` object.

```
$termios->setoflag( $c_oflag | &POSIX::OPOST );
```

**setospeed**

Set the output baud rate.

```
$termios->setospeed( &POSIX::B9600 );
```

Returns `undef` on failure.

**Baud rate values**

```
B38400 B75 B200 B134 B300 B1800 B150 B0 B19200 B1200 B9600 B600 B4800
B50 B2400 B110
```

**Terminal interface values**

```
TCSADRAIN TCSANOW TCOON TCIOFLUSH TCOFLUSH TCION TCIFLUSH
TCSAFLUSH TCIOFF TCOOFF
```

**c\_cc field values**

```
VEOF VEOL VERASE VINTR VKILL VQUIT VSUSP VSTART VSTOP VMIN VTIME
NCCS
```

**c\_cflag field values**

```
CLOCAL CREAD CSIZE CS5 CS6 CS7 CS8 CSTOPB HUPCL PARENB PARODD
```

**c\_iflag field values**

```
BRKINT ICRNL IGNBRK IGNCR IGNPAR INLCR INPCK ISTRIP IXOFF IXON
PARMRK
```

**c\_lflag field values**

```
ECHO ECHOE ECHOK ECHONL ICANON IEXTEN ISIG NOFLSH TOSTOP
```

**c\_oflag field values**

```
OPOST
```

**PATHNAME CONSTANTS****Constants**

```
_PC_CHOWN_RESTRICTED _PC_LINK_MAX _PC_MAX_CANON
```

`_PC_MAX_INPUT` `_PC_NAME_MAX` `_PC_NO_TRUNC` `_PC_PATH_MAX`  
`_PC_PIPE_BUF` `_PC_VDISABLE`

## POSIX CONSTANTS

Constants

`_POSIX_ARG_MAX` `_POSIX_CHILD_MAX` `_POSIX_CHOWN_RESTRICTED`  
`_POSIX_JOB_CONTROL` `_POSIX_LINK_MAX` `_POSIX_MAX_CANON`  
`_POSIX_MAX_INPUT` `_POSIX_NAME_MAX` `_POSIX_NGROUPS_MAX`  
`_POSIX_NO_TRUNC` `_POSIX_OPEN_MAX` `_POSIX_PATH_MAX`  
`_POSIX_PIPE_BUF` `_POSIX_SAVED_IDS` `_POSIX_SSIZE_MAX`  
`_POSIX_STREAM_MAX` `_POSIX_TZNAME_MAX` `_POSIX_VDISABLE`  
`_POSIX_VERSION`

## SYSTEM CONFIGURATION

Constants

`_SC_ARG_MAX` `_SC_CHILD_MAX` `_SC_CLK_TCK` `_SC_JOB_CONTROL`  
`_SC_NGROUPS_MAX` `_SC_OPEN_MAX` `_SC_PAGESIZE` `_SC_SAVED_IDS`  
`_SC_STREAM_MAX` `_SC_TZNAME_MAX` `_SC_VERSION`

## ERRNO

Constants

`E2BIG` `EACCES` `EADDRINUSE` `EADDRNOTAVAIL` `EAFNOSUPPORT` `EAGAIN`  
`EALREADY` `EBADF` `EBUSY` `ECHILD` `ECONNABORTED` `ECONNREFUSED`  
`ECONNRESET` `EDEADLK` `EDESTADDRREQ` `EDOM` `EDQUOT` `EEXIST` `EFAULT`  
`EFBIG` `EHOSTDOWN` `EHOSTUNREACH` `EINPROGRESS` `EINTR` `EINVAL` `EIO`  
`EISCONN` `EISDIR` `ELOOP` `EMFILE` `EMLINK` `EMSGSIZE` `ENAMETOOLONG`  
`ENETDOWN` `ENETRESET` `ENETUNREACH` `ENFILE` `ENOBUFS` `ENODEV` `ENOENT`  
`ENOEXEC` `ENOLCK` `ENOMEM` `ENOPROTOPT` `ENOSPC` `ENOSYS` `ENOTBLK`  
`ENOTCONN` `ENOTDIR` `ENOTEMPTY` `ENOTSOCK` `ENOTTY` `ENXIO` `EOPNOTSUPP`  
`EPERM` `EPFNOSUPPORT` `EPIPE` `EPROCLIM` `EPROTONOSUPPORT`  
`EPROTOTYPE` `ERANGE` `EREMOTE` `ERESTART` `EROFS` `ESHUTDOWN`  
`ESOCKTNOSUPPORT` `ESPIPE` `ESRCH` `ESTALE` `ETIMEDOUT` `ETOOMANYREFS`  
`ETXTBSY` `EUSERS` `EWOULDBLOCK` `EXDEV`

## FCNTL

Constants

`FD_CLOEXEC` `F_DUPFD` `F_GETFD` `F_GETFL` `F_GETLK` `F_OK` `F_RDLCK` `F_SETFD`  
`F_SETFL` `F_SETLK` `F_SETLKW` `F_UNLCK` `F_WRLCK` `O_ACCMODE` `O_APPEND`  
`O_CREAT` `O_EXCL` `O_NOCTTY` `O_NONBLOCK` `O_RDONLY` `O_RDWR` `O_TRUNC`  
`O_WRONLY`

## FLOAT

Constants

`DBL_DIG` `DBL_EPSILON` `DBL_MANT_DIG` `DBL_MAX` `DBL_MAX_10_EXP`  
`DBL_MAX_EXP` `DBL_MIN` `DBL_MIN_10_EXP` `DBL_MIN_EXP` `FLT_DIG`  
`FLT_EPSILON` `FLT_MANT_DIG` `FLT_MAX` `FLT_MAX_10_EXP` `FLT_MAX_EXP`  
`FLT_MIN` `FLT_MIN_10_EXP` `FLT_MIN_EXP` `FLT_RADIX` `FLT_ROUNDS` `LDBL_DIG`  
`LDBL_EPSILON` `LDBL_MANT_DIG` `LDBL_MAX` `LDBL_MAX_10_EXP`  
`LDBL_MAX_EXP` `LDBL_MIN` `LDBL_MIN_10_EXP` `LDBL_MIN_EXP`

## LIMITS

Constants

`ARG_MAX` `CHAR_BIT` `CHAR_MAX` `CHAR_MIN` `CHILD_MAX` `INT_MAX` `INT_MIN`  
`LINK_MAX` `LONG_MAX` `LONG_MIN` `MAX_CANON` `MAX_INPUT` `MB_LEN_MAX`

NAME\_MAX NGROUPS\_MAX OPEN\_MAX PATH\_MAX PIPE\_BUF SCHAR\_MAX  
 SCHAR\_MIN SHRT\_MAX SHRT\_MIN SSIZE\_MAX STREAM\_MAX TZNAME\_MAX  
 UCHAR\_MAX UINT\_MAX ULONG\_MAX USHRT\_MAX

**LOCALE**

Constants

LC\_ALL LC\_COLLATE LC\_CTYPE LC\_MONETARY LC\_NUMERIC LC\_TIME

**MATH**

Constants

HUGE\_VAL

**SIGNAL**

Constants

SA\_NOCLDSTOP SA\_NOCLDWAIT SA\_NODEFER SA\_ONSTACK  
 SA\_RESETHAND SA\_RESTART SA\_SIGINFO SIGABRT SIGALRM SIGCHLD  
 SIGCONT SIGFPE SIGHUP SIGILL SIGINT SIGKILL SIGPIPE SIGQUIT SIGSEGV  
 SIGSTOP SIGTERM SIGTSTP SIGTTIN SIGTTOU SIGUSR1 SIGUSR2 SIG\_BLOCK  
 SIG\_DFL SIG\_ERR SIG\_IGN SIG\_SETMASK SIG\_UNBLOCK

**STAT**

Constants

S\_IRGRP S\_IROTH S\_IRUSR S\_IRWXG S\_IRWXO S\_IRWXU S\_ISGID S\_ISUID  
 S\_IWGRP S\_IWOTH S\_IWUSR S\_IXGRP S\_IXOTH S\_IXUSR

Macros

S\_ISBLK S\_ISCHR S\_ISDIR S\_ISFIFO S\_ISREG

**STDLIB**

Constants

EXIT\_FAILURE EXIT\_SUCCESS MB\_CUR\_MAX RAND\_MAX

**STDIO**

Constants

BUFSIZ EOF FILENAME\_MAX L\_ctermid L\_cuserid L\_tmpname TMP\_MAX

**TIME**

Constants

CLK\_TCK CLOCKS\_PER\_SEC

**UNISTD**

Constants

R\_OK SEEK\_CUR SEEK\_END SEEK\_SET STDIN\_FILENO STDOUT\_FILENO  
 STDERR\_FILENO W\_OK X\_OK

**WAIT**

Constants

WNOHANG WUNTRACED  
 WNOHANG

Do not suspend the calling process until a child process  
 changes state but instead return immediately.

WUNTRACED

---

Catch stopped child processes.

Macros

WIFEXITED WEXITSTATUS WIFSIGNALED WTERMSIG WIFSTOPPED WSTOPSIG  
WIFEXITED

WIFEXITED(\$?) returns true if the child process exited normally (`exit()` or by falling off the end of `main()`)

WEXITSTATUS

WEXITSTATUS(\$?) returns the normal exit status of the child process (only meaningful if `WIFEXITED($?)` is true)

WIFSIGNALED

WIFSIGNALED(\$?) returns true if the child process terminated because of a signal

WTERMSIG

WTERMSIG(\$?) returns the signal the child process terminated for (only meaningful if `WIFSIGNALED($?)` is true)

WIFSTOPPED

WIFSTOPPED(\$?) returns true if the child process is currently stopped (can happen only if you specified the `WUNTRACED` flag to `waitpid()`)

WSTOPSIG

WSTOPSIG(\$?) returns the signal the child process was stopped for (only meaningful if `WIFSTOPPED($?)` is true)