Library functions (GNU C99)

## Diagnostics

NDEBUG

void assert(scalar expression);

## Complex

complex

imaginary

\_Complex\_I

\_Imaginary\_I

I

#pragma STDC CX\_LIMITED\_RANGE on-off-switch

double complex cacos(double complex z);

float complex cacosf(float complex z);

long double complex cacosl(long double complex z);

double complex casin(double complex z);

float complex casinf(float complex z);

long double complex casinl(long double complex z);

double complex catan(double complex z);

float complex catanf(float complex z);

long double complex catanl(long double complex z);

double complex ccos(double complex z);

float complex ccosf(float complex z);

long double complex ccosl(long double complex z);

double complex csin(double complex z);

float complex csinf(float complex z);

long double complex csinl(long double complex z);

double complex ctan(double complex z);

float complex ctanf(float complex z);

long double complex ctanl(long double complex z);

double complex cacosh(double complex z);

float complex cacoshf(float complex z);

long double complex cacoshl(long double complex z);

double complex casinh(double complex z);

float complex casinhf(float complex z);

long double complex casinhl(long double complex z);

double complex catanh(double complex z);

float complex catanhf(float complex z);

long double complex catanhl(long double complex z);

double complex ccosh(double complex z);

float complex ccoshf(float complex z);

long double complex ccoshl(long double complex z);

double complex csinh(double complex z);

float complex csinhf(float complex z);

long double complex csinhl(long double complex z);

double complex ctanh(double complex z);

float complex ctanhf(float complex z);

long double complex ctanhl(long double complex z);

double complex cexp(double complex z);

float complex cexpf(float complex z);

long double complex cexpl(long double complex z);

double complex clog(double complex z);

float complex clogf(float complex z);

long double complex clogl(long double complex z);

double cabs(double complex z);

float cabsf(float complex z);

long double cabsl(long double complex z);

double complex cpow(double complex x, double complex y);

float complex cpowf(float complex x, float complex y);

long double complex cpowl(long double complex x, long double complex y);

double complex csqrt(double complex z);

float complex csqrtf(float complex z);

long double complex csqrtl(long double complex z);

double carg(double complex z);

float cargf(float complex z);

long double cargl(long double complex z);

double cimag(double complex z);

float cimagf(float complex z);

long double cimagl(long double complex z);

double complex conj(double complex z);

float complex conjf(float complex z);

long double complex conjl(long double complex z);

double complex cproj(double complex z);

float complex cprojf(float complex z);

long double complex cprojl(long double complex z);

double creal(double complex z);

float crealf(float complex z);

long double creall(long double complex z);

## Character handling

int isalnum(int c);

int isalpha(int c);

int isblank(int c);

int iscntrl(int c);

int isdigit(int c);

int isgraph(int c);

int islower(int c);

int isprint(int c);

int ispunct(int c);

int isspace(int c);

int isupper(int c);

int isxdigit(int c);

int tolower(int c);

int toupper(int c);

## Errors

EDOM

EILSEQ

ANGE

errno

## Floating-point environment

fenv\_t

FE\_OVERFLOW

FE\_TOWARDZERO

fexcept\_t

FE\_UNDERFLOW

FE\_UPWARD

FE\_DIVBYZERO

FE\_ALL\_EXCEPT

FE\_DFL\_ENV

FE\_INEXACT

FE\_DOWNWARD

FE\_INVALID

FE\_TONEAREST

#pragma STDC FENV\_ACCESS on-off-switch

int feclearexcept(int excepts);

int fegetexceptflag(fexcept\_t \*flagp, int excepts);

int feraiseexcept(int excepts);

int fesetexceptflag(const fexcept\_t \*flagp, int excepts);

int fetestexcept(int excepts);

int fegetround(void);

int fesetround(int round);

int fegetenv(fenv\_t \*envp);

int feholdexcept(fenv\_t \*envp);

int fesetenv(const fenv\_t \*envp);

int feupdateenv(const fenv\_t \*envp);

## Characteristics of floating types

FLT\_ROUNDS

DBL\_MIN\_EXP

FLT\_MAX

FLT\_EVAL\_METHOD

LDBL\_MIN\_EXP

DBL\_MAX

FLT\_RADIX

FLT\_MIN\_10\_EXP

LDBL\_MAX

FLT\_MANT\_DIG

DBL\_MIN\_10\_EXP

FLT\_EPSILON

DBL\_MANT\_DIG

LDBL\_MIN\_10\_EXP

DBL\_EPSILON

LDBL\_MANT\_DIG

FLT\_MAX\_EXP

LDBL\_EPSILON

DECIMAL\_DIG

DBL\_MAX\_EXP

FLT\_MIN

FLT\_DIG

LDBL\_MAX\_EXP

DBL\_MIN

DBL\_DIG

FLT\_MAX\_10\_EXP

LDBL\_MIN

LDBL\_DIG

DBL\_MAX\_10\_EXP

FLT\_MIN\_EXP

LDBL\_MAX\_10\_EXP

## Format conversion of integer types

imaxdiv\_t

PRIdN

PRIdLEASTN

PRIdFASTN

PRIdMAX

PRIdPTR

PRIiN

PRIiLEASTN

PRIiFASTN

PRIiMAX

PRIiPTR

PRIoN

PRIoLEASTN

PRIoFASTN

PRIoMAX

PRIoPTR

PRIuN

PRIuLEASTN

PRIuFASTN

PRIuMAX

PRIuPTR

PRIxN

PRIxLEASTN

PRIxFASTN

PRIxMAX

PRIxPTR

PRIXN

PRIXLEASTN

PRIXFASTN

PRIXMAX

PRIXPTR

SCNdN

SCNdLEASTN

SCNdFASTN

SCNdMAX

SCNdPTR

SCNiN

SCNiLEASTN

SCNiFASTN

SCNiMAX

SCNiPTR

SCNoN

SCNoLEASTN

SCNoFASTN

SCNoMAX

SCNoPTR

SCNuN

SCNuLEASTN

SCNuFASTN

SCNuMAX

SCNuPTR

SCNxN

SCNxLEASTN

SCNxFASTN

SCNxMAX

SCNxPTR

intmax\_t imaxabs(intmax\_t j);

imaxdiv\_t imaxdiv(intmax\_t numer, intmax\_t denom);

intmax\_t strtoimax(const char \* restrict nptr, char \*\* restrict endptr, int base);

uintmax\_t strtoumax(const char \* restrict nptr, char \*\* restrict endptr, int base);

intmax\_t wcstoimax(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

uintmax\_t wcstoumax(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

## Alternative spellings

and

bitor

not\_eq

xor

and\_eq

compl

or

xor\_eq

bitand

not

or\_eq

## Sizes of integer types

CHAR\_BIT

CHAR\_MAX

INT\_MIN

ULONG\_MAX

SCHAR\_MIN

MB\_LEN\_MAX

INT\_MAX

LLONG\_MIN

SCHAR\_MAX

SHRT\_MIN

UINT\_MAX

LLONG\_MAX

UCHAR\_MAX

SHRT\_MAX

LONG\_MIN

ULLONG\_MAX

CHAR\_MIN

USHRT\_MAX

LONG\_MAX

## Localization

struct lconv

LC\_ALL

LC\_CTYPE

LC\_NUMERIC

NULL

LC\_COLLATE

LC\_MONETARY

LC\_TIME

char \*setlocale(int category, const char \*locale);

struct lconv \*localeconv(void);

## Mathematics

float\_t

FP\_INFINITE

FP\_FAST\_FMAL

double\_t

FP\_NAN

FP\_ILOGB0

HUGE\_VAL

FP\_NORMAL

FP\_ILOGBNAN

HUGE\_VALF

FP\_SUBNORMAL

MATH\_ERRNO

HUGE\_VALL

FP\_ZERO

MATH\_ERREXCEPT

INFINITY

FP\_FAST\_FMA

math\_errhandling

NAN

FP\_FAST\_FMAF

#pragma STDC FP\_CONTRACT on-off-switch

int fpclassify(real-floating x);

int isfinite(real-floating x);

int isinf(real-floating x);

int isnan(real-floating x);

int isnormal(real-floating x);

int signbit(real-floating x);

double acos(double x);

float acosf(float x);

long double acosl(long double x);

double asin(double x);

float asinf(float x);

long double asinl(long double x);

double atan(double x);

float atanf(float x);

long double atanl(long double x);

double atan2(double y, double x);

float atan2f(float y, float x);

long double atan2l(long double y, long double x);

double cos(double x);

float cosf(float x);

long double cosl(long double x);

double sin(double x);

float sinf(float x);

long double sinl(long double x);

double tan(double x);

float tanf(float x);

long double tanl(long double x);

double acosh(double x);

float acoshf(float x);

long double acoshl(long double x);

double asinh(double x);

float asinhf(float x);

long double asinhl(long double x);

double atanh(double x);

float atanhf(float x);

long double atanhl(long double x);

double cosh(double x);

float coshf(float x);

long double coshl(long double x);

double sinh(double x);

float sinhf(float x);

long double sinhl(long double x);

double tanh(double x);

float tanhf(float x);

long double tanhl(long double x);

double exp(double x);

float expf(float x);

long double expl(long double x);

double exp2(double x);

float exp2f(float x);

long double exp2l(long double x);

double expm1(double x);

float expm1f(float x);

long double expm1l(long double x);

double frexp(double value, int \*exp);

float frexpf(float value, int \*exp);

long double frexpl(long double value, int \*exp);

int ilogb(double x);

int ilogbf(float x);

int ilogbl(long double x);

double ldexp(double x, int exp);

float ldexpf(float x, int exp);

long double ldexpl(long double x, int exp);

double log(double x);

float logf(float x);

long double logl(long double x);

double log10(double x);

float log10f(float x);

long double log10l(long double x);

double log1p(double x);

float log1pf(float x);

long double log1pl(long double x);

double log2(double x);

float log2f(float x);

long double log2l(long double x);

double logb(double x);

float logbf(float x);

long double logbl(long double x);

double modf(double value, double \*iptr);

float modff(float value, float \*iptr);

long double modfl(long double value, long double \*iptr);

double scalbn(double x, int n);

float scalbnf(float x, int n);

long double scalbnl(long double x, int n);

double scalbln(double x, long int n);

float scalblnf(float x, long int n);

long double scalblnl(long double x, long int n);

double cbrt(double x);

float cbrtf(float x);

long double cbrtl(long double x);

double fabs(double x);

float fabsf(float x);

long double fabsl(long double x);

double hypot(double x, double y);

float hypotf(float x, float y);

long double hypotl(long double x, long double y);

double pow(double x, double y);

float powf(float x, float y);

long double powl(long double x, long double y);

double sqrt(double x);

float sqrtf(float x);

long double sqrtl(long double x);

double erf(double x);

float erff(float x);

long double erfl(long double x);

double erfc(double x);

float erfcf(float x);

long double erfcl(long double x);

double lgamma(double x);

float lgammaf(float x);

long double lgammal(long double x);

double tgamma(double x);

float tgammaf(float x);

long double tgammal(long double x);

double ceil(double x);

float ceilf(float x);

long double ceill(long double x);

double floor(double x);

float floorf(float x);

long double floorl(long double x);

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);

long int lrint(double x);

long int lrintf(float x);

long int lrintl(long double x);

long long int llrint(double x);

long long int llrintf(float x);

long long int llrintl(long double x);

double round(double x);

float roundf(float x);

long double roundl(long double x);

long int lround(double x);

long int lroundf(float x);

long int lroundl(long double x);

long long int llround(double x);

long long int llroundf(float x);

long long int llroundl(long double x);

double trunc(double x);

float truncf(float x);

long double truncl(long double x);

double fmod(double x, double y);

float fmodf(float x, float y);

long double fmodl(long double x, long double y);

double remainder(double x, double y);

float remainderf(float x, float y);

long double remainderl(long double x, long double y);

double remquo(double x, double y, int \*quo);

float remquof(float x, float y, int \*quo);

long double remquol(long double x, long double y, int \*quo);

double copysign(double x, double y);

float copysignf(float x, float y);

long double copysignl(long double x, long double y);

double nan(const char \*tagp);

float nanf(const char \*tagp);

long double nanl(const char \*tagp);

double nextafter(double x, double y);

float nextafterf(float x, float y);

long double nextafterl(long double x, long double y);

double nexttoward(double x, long double y);

float nexttowardf(float x, long double y);

long double nexttowardl(long double x, long double y);

double fdim(double x, double y);

float fdimf(float x, float y);

long double fdiml(long double x, long double y);

double fmax(double x, double y);

float fmaxf(float x, float y);

long double fmaxl(long double x, long double y);

double fmin(double x, double y);

float fminf(float x, float y);

long double fminl(long double x, long double y);

double fma(double x, double y, double z);

float fmaf(float x, float y, float z);

long double fmal(long double x, long double y, long double z);

int isgreater(real-floating x, real-floating y);

int isgreaterequal(real-floating x, real-floating y);

int isless(real-floating x, real-floating y);

int islessequal(real-floating x, real-floating y);

int islessgreater(real-floating x, real-floating y);

int isunordered(real-floating x, real-floating y);

## Nonlocal jumps

jmp\_buf

int setjmp(jmp\_buf env);

void longjmp(jmp\_buf env, int val);

## Signal handling

sig\_atomic\_t

SIG\_IGN

SIGILL

SIGTERM

SIG\_DFL

SIGABRT

SIGINT

SIG\_ERR

SIGFPE

SIGSEGV

void (\*signal(int sig, void (\*func)(int)))(int);

int raise(int sig);

## Variable arguments

va\_list

type va\_arg(va\_list ap, type);

void va\_copy(va\_list dest, va\_list src);

void va\_end(va\_list ap);

void va\_start(va\_list ap, parmN);

## Boolean type and values

bool

true

false

\_ \_bool\_true\_false\_are\_defined

## Common definitions

ptrdiff\_t

size\_t

wchar\_t

NULL

offsetof(type, member-designator)

## Integer types

intN\_t

INT\_LEASTN\_MIN

PTRDIFF\_MAX

uintN\_t

INT\_LEASTN\_MAX

SIG\_ATOMIC\_MIN

int\_leastN\_t

UINT\_LEASTN\_MAX

SIG\_ATOMIC\_MAX

uint\_leastN\_t

INT\_FASTN\_MIN

SIZE\_MAX

int\_fastN\_t

INT\_FASTN\_MAX

WCHAR\_MIN

uint\_fastN\_t

UINT\_FASTN\_MAX

WCHAR\_MAX

intptr\_t

INTPTR\_MIN

WINT\_MIN

uintptr\_t

INTPTR\_MAX

WINT\_MAX

intmax\_t

UINTPTR\_MAX

INTN\_C(value)

uintmax\_t

INTMAX\_MIN

UINTN\_C(value)

INTN\_MIN

INTMAX\_MAX

INTMAX\_C(value)

INTN\_MAX

UINTMAX\_MAX

UINTMAX\_C(value)

UINTN\_MAX

PTRDIFF\_MIN

## Input/output

size\_t

\_IOLBF

FILENAME\_MAX

TMP\_MAX

FILE

\_IONBF

L\_tmpnam

stderr

fpos\_t

BUFSIZ

SEEK\_CUR

stdin

NULL

EOF

SEEK\_END

stdout

\_IOFBF

FOPEN\_MAX

SEEK\_SET

int remove(const char \*filename);

int rename(const char \*old, const char \*new);

FILE \*tmpfile(void);

char \*tmpnam(char \*s);

int fclose(FILE \*stream);

int fflush(FILE \*stream);

FILE \*fopen(const char \* restrict filename, const char \* restrict mode);

FILE \*freopen(const char \* restrict filename, const char \* restrict mode, FILE \* restrict stream);

void setbuf(FILE \* restrict stream, char \* restrict buf);

int setvbuf(FILE \* restrict stream, char \* restrict buf, int mode, size\_t size);

int fprintf(FILE \* restrict stream, const char \* restrict format, ...);

int fscanf(FILE \* restrict stream, const char \* restrict format, ...);

int printf(const char \* restrict format, ...);

int scanf(const char \* restrict format, ...);

int snprintf(char \* restrict s, size\_t n, const char \* restrict format, ...);

int sprintf(char \* restrict s, const char \* restrict format, ...);

int sscanf(const char \* restrict s, const char \* restrict format, ...);

int vfprintf(FILE \* restrict stream, const char \* restrict format, va\_list arg);

int vfscanf(FILE \* restrict stream, const char \* restrict format, va\_list arg);

int vprintf(const char \* restrict format, va\_list arg);

int vscanf(const char \* restrict format, va\_list arg);

int vsnprintf(char \* restrict s, size\_t n, const char \* restrict format, va\_list arg);

int vsprintf(char \* restrict s, const char \* restrict format, va\_list arg);

int vsscanf(const char \* restrict s, const char \* restrict format, va\_list arg);

int fgetc(FILE \*stream);

char \*fgets(char \* restrict s, int n, FILE \* restrict stream);

int fputc(int c, FILE \*stream);

int fputs(const char \* restrict s, FILE \* restrict stream);

int getc(FILE \*stream);

int getchar(void);

char \*gets(char \*s);

int putc(int c, FILE \*stream);

int putchar(int c);

int puts(const char \*s);

int ungetc(int c, FILE \*stream);

size\_t fread(void \* restrict ptr, size\_t size, size\_t nmemb, FILE \* restrict stream);

size\_t fwrite(const void \* restrict ptr, size\_t size, size\_t nmemb, FILE \* restrict stream);

int fgetpos(FILE \* restrict stream, fpos\_t \* restrict pos);

int fseek(FILE \*stream, long int offset, int whence);

int fsetpos(FILE \*stream, const fpos\_t \*pos);

long int ftell(FILE \*stream);

void rewind(FILE \*stream);

void clearerr(FILE \*stream);

int feof(FILE \*stream);

int ferror(FILE \*stream);

void perror(const char \*s);

## General utilities

size\_t

ldiv\_t

EXIT\_FAILURE

MB\_CUR\_MAX

wchar\_t

lldiv\_t

EXIT\_SUCCESS

div\_t

NULL

RAND\_MAX

double atof(const char \*nptr);

int atoi(const char \*nptr);

long int atol(const char \*nptr);

long long int atoll(const char \*nptr);

double strtod(const char \* restrict nptr, char \*\* restrict endptr);

float strtof(const char \* restrict nptr, char \*\* restrict endptr);

long double strtold(const char \* restrict nptr, char \*\* restrict endptr);

long int strtol(const char \* restrict nptr, char \*\* restrict endptr, int base);

long long int strtoll(const char \* restrict nptr, char \*\* restrict endptr, int base);

unsigned long int strtoul(const char \* restrict nptr, char \*\* restrict endptr, int base);

unsigned long long int strtoull(const char \* restrict nptr, char \*\* restrict endptr, int base);

int rand(void);

void srand(unsigned int seed);

void \*calloc(size\_t nmemb, size\_t size);

void free(void \*ptr);

void \*malloc(size\_t size);

void \*realloc(void \*ptr, size\_t size);

void abort(void);

int atexit(void (\*func)(void));

void exit(int status);

void \_Exit(int status);

char \*getenv(const char \*name);

int system(const char \*string);

void \*bsearch(const void \*key,

const void \*base,

size\_t nmemb,

size\_t size,

int (\*compar)(const void \*, const void \*));

void qsort(void \*base, size\_t nmemb, size\_t size, int (\*compar)(const void \*, const void \*));

int abs(int j);

long int labs(long int j);

long long int llabs(long long int j);

div\_t div(int numer, int denom);

ldiv\_t ldiv(long int numer, long int denom);

lldiv\_t lldiv(long long int numer, long long int denom);

int mblen(const char \*s, size\_t n);

int mbtowc(wchar\_t \* restrict pwc, const char \* restrict s, size\_t n);

int wctomb(char \*s, wchar\_t wchar);

size\_t mbstowcs(wchar\_t \* restrict pwcs, const char \* restrict s, size\_t n);

size\_t wcstombs(char \* restrict s, const wchar\_t \* restrict pwcs, size\_t n);

## String handling

size\_t

NULL

void \*memcpy(void \* restrict s1, const void \* restrict s2, size\_t n);

void \*memmove(void \*s1, const void \*s2, size\_t n);

char \*strcpy(char \* restrict s1, const char \* restrict s2);

char \*strncpy(char \* restrict s1, const char \* restrict s2, size\_t n);

char \*strcat(char \* restrict s1, const char \* restrict s2);

char \*strncat(char \* restrict s1, const char \* restrict s2, size\_t n);

int memcmp(const void \*s1, const void \*s2, size\_t n);

int strcmp(const char \*s1, const char \*s2);

int strcoll(const char \*s1, const char \*s2);

int strncmp(const char \*s1, const char \*s2, size\_t n);

size\_t strxfrm(char \* restrict s1, const char \* restrict s2, size\_t n);

void \*memchr(const void \*s, int c, size\_t n);

char \*strchr(const char \*s, int c);

size\_t strcspn(const char \*s1, const char \*s2);

char \*strpbrk(const char \*s1, const char \*s2);

char \*strrchr(const char \*s, int c);

size\_t strspn(const char \*s1, const char \*s2);

char \*strstr(const char \*s1, const char \*s2);

char \*strtok(char \* restrict s1, const char \* restrict s2);

void \*memset(void \*s, int c, size\_t n);

char \*strerror(int errnum);

size\_t strlen(const char \*s);

## Type-generic math

acos

sqrt

fmod

nextafter

asin

abs

frexp

nexttoward

atan

atan2

hypot

remainder

acosh

cbrt

ilogb

remquo

asinh

ceil

ldexp

rint

atanh

copysign

lgamma

round

cos

erf

llrint

scalbn

sin

erfc

llround

scalbln

tan

exp2

log10

tgamma

cosh

expm1

log1p

trunc

sinh

fdim

log2

carg

tanh

floor

logb

cimag

exp

fma

lrint

conj

log

fmax

lround

cproj

pow

fmin

nearbyint

creal

## Date and time

NULL

size\_t

time\_t

CLOCKS\_PER\_SEC

clock\_t

struct tm

clock\_t clock(void);

double difftime(time\_t time1, time\_t time0);

time\_t mktime(struct tm \*timeptr);

time\_t time(time\_t \*timer);

char \*asctime(const struct tm \*timeptr);

char \*ctime(const time\_t \*timer);

struct tm \*gmtime(const time\_t \*timer);

struct tm \*localtime(const time\_t \*timer);

size\_t strftime(char \* restrict s,

size\_t maxsize,

const char \* restrict format,

const struct tm \* restrict timeptr);

## Extended multibyte/wide character utilities

wchar\_t

wint\_t

WCHAR\_MAX

size\_t

struct tm

WCHAR\_MIN

mbstate\_t

NULL

WEOF

int fwprintf(FILE \* restrict stream, const wchar\_t \* restrict format, ...);

int fwscanf(FILE \* restrict stream, const wchar\_t \* restrict format, ...);

int swprintf(wchar\_t \* restrict s, size\_t n, const wchar\_t \* restrict format, ...);

int swscanf(const wchar\_t \* restrict s, const wchar\_t \* restrict format, ...);

int vfwprintf(FILE \* restrict stream, const wchar\_t \* restrict format, va\_list arg);

int vfwscanf(FILE \* restrict stream, const wchar\_t \* restrict format, va\_list arg);

int vswprintf(wchar\_t \* restrict s, size\_t n, const wchar\_t \* restrict format, va\_list arg);

int vswscanf(const wchar\_t \* restrict s, const wchar\_t \* restrict format, va\_list arg);

int vwprintf(const wchar\_t \* restrict format, va\_list arg);

int vwscanf(const wchar\_t \* restrict format, va\_list arg);

int wprintf(const wchar\_t \* restrict format, ...);

int wscanf(const wchar\_t \* restrict format, ...);

wint\_t fgetwc(FILE \*stream);

wchar\_t \*fgetws(wchar\_t \* restrict s, int n, FILE \* restrict stream);

wint\_t fputwc(wchar\_t c, FILE \*stream);

int fputws(const wchar\_t \* restrict s, FILE \* restrict stream);

int fwide(FILE \*stream, int mode);

wint\_t getwc(FILE \*stream);

wint\_t getwchar(void);

wint\_t putwc(wchar\_t c, FILE \*stream);

wint\_t putwchar(wchar\_t c);

wint\_t ungetwc(wint\_t c, FILE \*stream);

double wcstod(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr);

float wcstof(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr);

long double wcstold(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr);

long int wcstol(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

long long int wcstoll(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

unsigned long int wcstoul(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

unsigned long long int wcstoull(const wchar\_t \* restrict nptr, wchar\_t \*\* restrict endptr, int base);

wchar\_t \*wcscpy(wchar\_t \* restrict s1, const wchar\_t \* restrict s2);

wchar\_t \*wcsncpy(wchar\_t \* restrict s1, const wchar\_t \* restrict s2, size\_t n);

wchar\_t \*wmemcpy(wchar\_t \* restrict s1, const wchar\_t \* restrict s2, size\_t n);

wchar\_t \*wmemmove(wchar\_t \*s1, const wchar\_t \*s2, size\_t n);

wchar\_t \*wcscat(wchar\_t \* restrict s1, const wchar\_t \* restrict s2);

wchar\_t \*wcsncat(wchar\_t \* restrict s1, const wchar\_t \* restrict s2, size\_t n);

int wcscmp(const wchar\_t \*s1, const wchar\_t \*s2);

int wcscoll(const wchar\_t \*s1, const wchar\_t \*s2);

int wcsncmp(const wchar\_t \*s1, const wchar\_t \*s2, size\_t n);

size\_t wcsxfrm(wchar\_t \* restrict s1, const wchar\_t \* restrict s2, size\_t n);

int wmemcmp(const wchar\_t \*s1, const wchar\_t \*s2, size\_t n);

wchar\_t \*wcschr(const wchar\_t \*s, wchar\_t c);

size\_t wcscspn(const wchar\_t \*s1, const wchar\_t \*s2);

wchar\_t \*wcspbrk(const wchar\_t \*s1, const wchar\_t \*s2);

wchar\_t \*wcsrchr(const wchar\_t \*s, wchar\_t c);

size\_t wcsspn(const wchar\_t \*s1, const wchar\_t \*s2);

wchar\_t \*wcsstr(const wchar\_t \*s1, const wchar\_t \*s2);

wchar\_t \*wcstok(wchar\_t \* restrict s1, const wchar\_t \* restrict s2, wchar\_t \*\* restrict ptr);

wchar\_t \*wmemchr(const wchar\_t \*s, wchar\_t c, size\_t n);

size\_t wcslen(const wchar\_t \*s);

wchar\_t \*wmemset(wchar\_t \*s, wchar\_t c, size\_t n);

size\_t wcsftime(wchar\_t \* restrict s,

size\_t maxsize,

const wchar\_t \* restrict format,

const struct tm \* restrict timeptr);

wint\_t btowc(int c);

int wctob(wint\_t c);

int mbsinit(const mbstate\_t \*ps);

size\_t mbrlen(const char \* restrict s, size\_t n, mbstate\_t \* restrict ps);

size\_t mbrtowc(wchar\_t \* restrict pwc, const char \* restrict s, size\_t n, mbstate\_t \* restrict ps);

size\_t wcrtomb(char \* restrict s, wchar\_t wc, mbstate\_t \* restrict ps);

size\_t mbsrtowcs(wchar\_t \* restrict dst, const char \*\* restrict src, size\_t len, mbstate\_t \* restrict ps);

size\_t wcsrtombs(char \* restrict dst, const wchar\_t \*\* restrict src, size\_t len, mbstate\_t \* restrict ps);

## Wide character classification and mapping utilities

wint\_t

wctrans\_t

wctype\_t

WEOF

int iswalnum(wint\_t wc);

int iswalpha(wint\_t wc);

int iswblank(wint\_t wc);

int iswcntrl(wint\_t wc);

int iswdigit(wint\_t wc);

int iswgraph(wint\_t wc);

int iswlower(wint\_t wc);

int iswprint(wint\_t wc);

int iswpunct(wint\_t wc);

int iswspace(wint\_t wc);

int iswupper(wint\_t wc);

int iswxdigit(wint\_t wc);

int iswctype(wint\_t wc, wctype\_t desc);

wctype\_t wctype(const char \*property);

wint\_t towlower(wint\_t wc);

wint\_t towupper(wint\_t wc);

wint\_t towctrans(wint\_t wc, wctrans\_t desc);

wctrans\_t wctrans(const char \*property);