# C++ Standard Library

The C++ standard library provides a large number of library functions (under different header files) for performing common tasks.

### C++ Header Files

* cmath - declares functions for mathematical operations
* cstdlib - usually general purpose functions
* iostream - functions for standard I/O
* cstring - functions to manipulate C-style string
* cctype - functions to classify (and transform) individual characters
* csignal - to handle signals
* clocale - internationalization support task such as date/time formatting
* cwctype - for classifying and transforming individual wide characters
* cstdio - C Standard Input and Output Library
* cwchar - to work with C wide string
* cuchar - convert between multibyte characters and UTF-16 or UTF-32
* csetjmp - bypass the normal function call and return discipline
* cfenv - access floating point environment
* ctime - functions to work with date and time

Bottom of Form

## <cmath>

| Title | Description |  |
| --- | --- | --- |
| C++ pow() | Computes Power a Number |  |
| C++ llrint() | Rounds argument using current rounding mode |  |
| C++ remainder() | Returns remainder of x/y |  |
| C++ nan() | returns a quiet NaN value |  |
| C++ cosh() | Returns Hyperbolic Cosine of an Angle |  |
| C++ copysign() | returns num with value of first and sign of second |  |
| C++ fma() | Returns Fused Multiply–Accumulate |  |
| C++ abs() | returns absolute value of an argument |  |
| C++ fabs() | returns absolute value of argument |  |
| C++ fdim() | Returns Positive Different Between Arguments |  |
| C++ fmin() | returns smallest among two given arguments |  |
| C++ fmax() | returns largest among two arguments passed |  |
| C++ hypot() | Returns Square Root of sum of square of Arguments |  |
| C++ nexttoward() | returns next value after x in direction of y |  |
| C++ nextafter() | returns next value after x in direction of y |  |
| C++ cbrt() | Computes Cube Root of a Number |  |
| C++ sqrt() | Computes Square Root of A Number |  |
| C++ remquo() | Computer remainder and stores quotient of x/y |  |
| C++ logb() | returns logarithm of |x| |  |
| C++ log1p() | returns natural logarithm of x+1. |  |
| C++ scalbln() | Scales x by FLT\_RADIX to the power n |  |
| C++ log2() | returns base2 logarithm of a number |  |
| C++ scalbn() | Scales x by FLT\_RADIX to the power n |  |
| C++ ilogb() | returns integral part of logarithm of |x| |  |
| C++ nearbyint() | Rounds argument to using current rounding mode |  |
| C++ expm1() | Returns e raised to Power Minus 1 |  |
| C++ ldexp() | returns product of x and 2 raised to the power e |  |
| C++ frexp() | breaks float to its binary significand |  |
| C++ exp2() | Returns 2 raised to a Number |  |
| C++ exp() | returns exponential (e) raised to a number |  |
| C++ modf() | Breaks Number Into Integral and Fractional Part |  |
| C++ log10() | Returns Base 10 Logarithm of a Number |  |
| C++ lrint() | Rounds argument using current rounding mode |  |
| C++ rint() | Rounds argument using current rounding mode |  |
| C++ llround() | Rounds argument to nearest long long int value |  |
| C++ lround() | Returns the long int value nearest to the argument |  |
| C++ round() | Returns integral value nearest to argument |  |
| C++ trunc() | Truncates the demical part of a number |  |
| C++ log() | Returns Natural Logarithm of a Number |  |
| C++ atanh() | returns arc hyperbolic tangent of a number |  |
| C++ asinh() | returns arc hyperbolic sine of a number |  |
| C++ acosh() | returns hyperbolic cosine of a number |  |
| C++ fmod() | Computes floating point remainder of division |  |
| C++ tanh() | returns hyperbolic tangent of an angle |  |
| C++ floor() | Returns floor value of decimal number |  |
| C++ ceil() | Return ceiling value of number |  |
| C++ sinh() | returns hyperbolic sine of an angle |  |
| C++ acos() | Returns Inverse cosine a Number |  |
| C++ atan2() | Returns Inverse Tangent of a Coordinate |  |
| C++ tan() | Returns Tangent of the Argument |  |
| C++ atan() | Returns Inverse tangent a Number |  |
| C++ asin() | Returns Inverse Sine a Number |  |
| C++ sin() | Returns Sine of the Argument |  |
| C++ cos() | Returns Cosine of the Argument |  |

## <cstdlib>

| Title | Description |  |
| --- | --- | --- |
| C++ calloc() | allocates block of memory and initializes to zero |  |
| C++ wcstombs() | converts wide character string to multibyte seq |  |
| C++ mbstowcs() | converts multibyte char string to wide char seq |  |
| C++ wctomb() | converts wide character to a multibyte character |  |
| C++ mbtowc() | converts multibyte character to a wide character |  |
| C++ mblen() | determines size of a multibyte character |  |
| C++ lldiv() | computes integral division of two long long int. |  |
| C++ llabs() | returns absolute value of a long long int data |  |
| C++ ldiv() | computes integral division of long int numbers |  |
| C++ labs() | returns absolute value of long or long int number |  |
| C++ abs() | returns absolute value of an integer |  |
| C++ div() | computes integral quotient and remainder of number |  |
| C++ qsort() | sorts array using quick-sort algorithm |  |
| C++ bsearch() | performs binary search on sorted array |  |
| C++ \_Exit() | causes termination without cleanup tasks |  |
| C++ quick\_exit() | causes termination without cleaning resources |  |
| C++ getenv() | returns pointer to environment variable passed |  |
| C++ at\_quick\_exit() | registers function and calls on quick termination |  |
| C++ atexit() | registers function to be called on termination |  |
| C++ realloc() | reallocates a block of previously allocated memory |  |
| C++ malloc() | allocates a block of unitialized memory |  |
| C++ free() | deallocates a block of memory |  |
| C++ srand() | seeds pseudo random number for rand() |  |
| C++ strtoull() | converts string to unsigned long long int |  |
| C++ strtoll() | converts string to long long int in C++ |  |
| C++ atol() | Converts String to Integer |  |
| C++ strtol() | Converts a string to number |  |
| C++ atof() | Converts String to Double |  |
| C++ strtod() | returns string float to double |  |

## <iostream>

| Title | Description |  |
| --- | --- | --- |
| C++ wclog | writes to log stream with wide character |  |
| C++ wcerr | prints to error stream as wide character type |  |
| C++ wcout | displays wide characters (Unicode) to screen |  |
| C++ wcin | accepts input in wide character type |  |
| C++ clog | used for streaming logs |  |
| C++ cerr | writes to error stream |  |
| C++ cout | displays output to output device i.e monitor |  |
| C++ cin | accepts input from user |  |

## <cstring>

| Title | Description |  |
| --- | --- | --- |
| C++ strxfrm() | transform byte string into implementation def form |  |
| C++ strcoll() | compares two null terminated string |  |
| C++ strlen() | returns length of given string |  |
| C++ strerror() | gives description of system error code |  |
| C++ memset() | copies character to beginning of string n times |  |
| C++ strtok() | split string based on delimiter |  |
| C++ strstr() | finds first occurrence of a substring in string |  |
| C++ strspn() | gives length of maximum initial segment |  |
| C++ strrchr() | searches last occurence of a character in string |  |
| C++ strpbrk() | search characters in one string in another string |  |
| C++ strcspn() | searches a string for characters in another string |  |
| C++ strchr() | searches for character in string |  |
| C++ memchr() | searches for character in string |  |
| C++ strncmp() | compares two strings lexographically |  |
| C++ strcmp() | compare two strings |  |
| C++ memcmp() | compares two pointer objects |  |
| C++ strncat() | appends string to end of another string |  |
| C++ strcat() | appends copy of string to end of another string |  |
| C++ strncpy() | copies character string from source to destination |  |
| C++ strcpy() | copies character string from source to destination |  |
| C++ memmove() | copies memory even if there is overlapping blocks |  |
| C++ memcpy() | copies block of memory from source to destination |  |

## <cctype>

| Title | Description |  |
| --- | --- | --- |
| C++ toupper() | converts a given character to uppercase |  |
| C++ tolower() | converts a given character to lowercase |  |
| C++ isxdigit() | checks if given character is hexadecimal character |  |
| C++ isupper() | check if given character is uppercase or not |  |
| C++ isspace() | check if given character is whitespace character |  |
| C++ ispunct() | check if given character is punctuation character |  |
| C++ isprint() | check if given character is printable or not |  |
| C++ islower() | checks if given character is lowercase |  |
| C++ isgraph() | checks if given character is graphic or not |  |
| C++ isdigit() | checks if given character is a digit or not |  |
| C++ iscntrl() | checks if given character is control character |  |
| C++ isblank() | checks if given character is a blank character |  |
| C++ isalpha() | checks if given character is alphabet or not |  |

## <csignal>

| Title | Description |  |
| --- | --- | --- |
| C++ raise() | sends signal to the program |  |
| C++ signal() | sets error handler for specifiied signal |  |

## <clocale>

| Title | Description |  |
| --- | --- | --- |
| C++ localeconv() | returns current locale formatting rules |  |
| C++ setlocale() | sets locale information for the current program |  |

## <cwctype>

| Title | Description |  |
| --- | --- | --- |
| C++ iswdigit() | checks if given wide character is digit or not |  |
| C++ wctype() | returns wide character classification |  |
| C++ wctrans() | returns current transformation for wide character |  |
| C++ towctrans() | transforms a given wide character |  |
| C++ iswctype() | checks if given wide char has certain property |  |
| C++ towupper() | converts given wide character to uppercase |  |
| C++ towlower() | converts given wide character to lowercase |  |
| C++ iswxdigit() | checks if given wide character is hexadecimal num |  |
| C++ iswupper() | checks if given wide character is uppercase |  |
| C++ iswspace() | checks if given wide character is wide whitespace |  |
| C++ iswpunct() | checks if given wide character is punctuation |  |
| C++ iswprint() | checks if given wide character can be printed |  |
| C++ iswlower() | checks if given wide character is lowercase |  |
| C++ iswgraph() | checks if wide char has graphical representation |  |
| C++ iswcntrl() | checks if given wide char is control character |  |
| C++ iswblank() | checks if given wide character is blank character |  |
| C++ iswalpha() | checks if given wide character is an alphabet |  |
| C++ iswalnum() | checks if given wide character is alphanumeric |  |

## <cstdio>

| Title | Description |  |
| --- | --- | --- |
| C++ getc() | reads next character from input stream |  |
| C++ fseek() | sets file position indicator for given file stream |  |
| C++ ungetc() | push previously read character back to the stream |  |
| C++ vsscanf() | read data from a string buffer |  |
| C++ vscanf() | read data from stdin |  |
| C++ vfscanf() | read data from a file stream |  |
| C++ freopen() | opens a new file with stream associated to another |  |
| C++ fflush() | flushes any buffered data to the respective device |  |
| C++ setvbuf() | change or specify buffering mode and buffer size |  |
| C++ perror() | prints error to stderr |  |
| C++ ferror() | checks for errors in given stream |  |
| C++ feof() function | checks if file stream EOF has been reached or not |  |
| C++ clearerr() | resets error flags and EOF indicator for stream |  |
| C++ rewind() | sets file position to beginning of stream |  |
| C++ ftell() | returns current position of file pointer |  |
| C++ fsetpos() | sets stream file pointer to given position |  |
| C++ fgetpos() | gets current file position |  |
| C++ fwrite() | writes specified number of characters to stream |  |
| C++ fread() | reads specified no. of characters from stream |  |
| C++ puts() | writes string to stdout |  |
| C++ putchar() | writes a character to stdout |  |
| C++ putc() | writes character to given output stream |  |
| C++ gets() | reads line from stdin |  |
| C++ getchar() | reads next character from stdin |  |
| C++ fputs() | writes string to file stream |  |
| C++ fputc() | writes character to given output stream |  |
| C++ fgets() | reads n number of characters from file stream |  |
| C++ fgetc() | reads the next character from given input stream |  |
| C++ vsprintf() | write formatted string to a string buffer |  |
| C++ vsnprintf() | write formatted string to string buffer |  |
| C++ vprintf() | printf but takes args from vlist instead |  |
| C++ vfprintf() | write formatted string to file stream |  |
| C++ sscanf() | read data from string buffer |  |
| C++ sprintf() | write a formatted string to buffer |  |
| C++ snprintf() | write formatted string to character string buffer |  |
| C++ scanf | read data form stdin |  |
| C++ printf() | write formatted string to stdout |  |
| C++ fscanf() | read data from file stream |  |
| C++ fprintf() | write a formatted string to file stream |  |
| C++ setbuf() | sets the internal buffer to be used for I/O |  |
| C++ fopen() | opens specified file |  |
| C++ fclose() | closes given file stream |  |
| C++ tmpnam() | generates unique filename |  |
| C++ tmpfile() | creates temporary file with auto-generated name |  |
| C++ rename() | renames or moves specified file |  |
| C++ remove() | deletes the specified file |  |

## <cwchar>

| Title | Description |  |
| --- | --- | --- |
| C++ wcscoll() | compares two null terminated wide string |  |
| C++ wcstoull() | converts wide string num to unsigned long long |  |
| C++ wcstoul() | converts wide str of given base to unsigned long |  |
| C++ wcstoll() | converts wide string of specified base to int |  |
| C++ wcsftime() | converts given date and time to wide character str |  |
| C++ wmemset() | copies single wide char for a certain num of time |  |
| C++ wmemmove() | moves wide chars from src to dest |  |
| C++ wmemcpy() | copies specified num of wide char from src to dest |  |
| C++ wmemcmp() | compares wide chars of two wide strings |  |
| C++ wmemchr() | searches for first occurrence of wide char |  |
| C++ wcsxfrm() | transforms wide string to implementation defined |  |
| C++ wcsstr() | finds first occurrence of wide substring in a str |  |
| C++ wcsspn() | returns length of maximum initial segment |  |
| C++ wcsrchr() | searches last occurrence of wide char in string |  |
| C++ wcspbrk() | searches for set of wide char in given wide string |  |
| C++ wcsncpy() | copies specified number of wide characters |  |
| C++ wcsncmp() | compares specified number of wide char of strings |  |
| C++ wcsncat() | appends specified num of wide char to another str |  |
| C++ wcslen() | returns length of the given wide string |  |
| C++ wcscspn() | returns number of wide char before first occurence |  |
| C++ wcscpy() | copies wide character string from source to dest |  |
| C++ wcscmp() | lexicographically compares two wide string |  |
| C++ wcschr() | searches for a wide character in a wide string |  |
| C++ wcscat() | appends copy of wide string to the end of another |  |
| C++ wcsrtombs() | convert wide char seq to narrow multibyte char seq |  |
| C++ wctob() | converts wide character to single byte character |  |
| C++ wcrtomb() | convert wide character to its narrow multibyte rep |  |
| C++ mbsrtowcs() | convert narrow multibyte char seq to wide char seq |  |
| C++ mbsinit() | describe initial conversion state of mbstate\_t obj |  |
| C++ mbrtowc() | converts narrow multibyte char to wide char |  |
| C++ mbrlen() | determines size in bytes of a multibyte character |  |
| C++ btowc() | converts character to its wide character |  |
| C++ wcstok() | returns next token in null terminated wide string |  |
| C++ wcstold() | converts wide string float number to long double |  |
| C++ wcstol() | converts wide string float number to long int |  |
| C++ wcstof() | converts wide string float number to float |  |
| C++ wcstod() | converts wide string float number to double |  |
| C++ wscanf() | reads wide character from stdin |  |
| C++ wprintf() | write formatted wide string to stdout |  |
| C++ vwscanf() | read wide character from stdin |  |
| C++ vwprintf() | write formatted wide string to stdout |  |
| C++ vswscanf() | read wide character string from wide string buffer |  |
| C++ vswprintf() | write formatted wide string to wide string buffer |  |
| C++ vfwscanf() | read wide character string from a file stream |  |
| C++ vfwprintf() | write formatted wide string to a file stream |  |
| C++ ungetwc() | push previously read wide character back to stream |  |
| C++ swscanf() | reads wide character from wide string buffer |  |
| C++ swprintf() | write formatted wide string to wide string buffer |  |
| C++ putwchar() | writes wide character to stdout |  |
| C++ putwc() | writes wide character to the given output stream |  |
| C++ getwchar() | reads next wide character from stdin |  |
| C++ getwc() | reads next wide character from input stream |  |
| C++ fwscanf() | reads wide character from file stream |  |
| C++ fwprintf() | write formatted wide string to a file stream |  |
| C++ fwide() | set or query orientation of given file stream |  |
| C++ fputws() | writes wide string except null wide char to output |  |
| C++ fputwc() | writes wide character to the given output stream |  |
| C++ fgetws() | reads specified num of wide characters from stream |  |
| C++ fgetwc() | reads next wide character from given input stream |  |

## <cuchar>

| Title | Description |  |
| --- | --- | --- |
| C++ mbrtoc32() | converts narrow multibyte char to 32 bit char |  |
| C++ mbrtoc16() | converts narrow multibyte char to 16 bit char |  |
| C++ c32rtomb() | converts 32 bit char to narrow multibyte char |  |
| C++ c16rtomb() | converts 16 bit char to narrow multibyte char |  |

## <csetjmp>

| Title | Description |  |
| --- | --- | --- |
| C++ longjmp() and setjmp() | restores previously saved environment |  |

## <cfenv>

| Title | Description |  |
| --- | --- | --- |
| C++ fetestexcept() | tests floating point exception |  |
| C++ feupdateenv() | updates floating point environment |  |
| C++ feholdexcept() | saves and clear floating point status flags |  |
| C++ fesetenv() | set floating point environment |  |
| C++ fesetround() | set rounding direction |  |
| C++ fegetenv() | store status of floating point env in an object |  |
| C++ fegetround() | gets round direction mode |  |
| C++ fesetexceptflag() | sets given floating point exceptions to the env |  |
| C++ fegetexceptflag() | gets floating point exception flags |  |
| C++ feraiseexcept() | raises floating point exceptions specified |  |
| C++ feclearexcept() | attempts to clear floating point exception flags |  |

## <ctime>

| Title | Description |  |
| --- | --- | --- |
| C++ strftime() | converts calendar time to multibyte character str |  |
| C++ mktime() | converts local calendar time to time since epoch |  |
| C++ localtime() | converts given time since epoch to local time |  |
| C++ gmtime() | converts given time since epoch to UTC time |  |
| C++ ctime() | converts time since epoch to char representation |  |
| C++ asctime() | converts calendar time to character representation |  |
| C++ time() | returns current calendar time |  |
| C++ difftime() | computes difference between two times in seconds |  |
| C++ clock() | returns processor time consumed by program |  |