C++ Standard Library Function

The C++ Standard Library provides a rich collection of functions for performing common mathematical calculations, string manipulations, character manipulations, input/output, error checking and many other useful operations. This makes the programmer's job easier, because these functions provide many of the capabilities programmers need. The C++ Standard Library functions are provided as part of the C++ programming environment.

Header file names ending in .h are "old-style" header files that have been superseded by the C++ Standard Library header files.

C++ Standard Library header file	Explanation
<iostream>	Contains function prototypes for the C++ standard input and standard output functions. This header file replaces header file <iostream.h>.
<iomanip>	Contains function prototypes for stream manipulators that format streams of data. This header file replaces header file <iomanip.h>.
<cmath>	Contains function prototypes for math library functions. This header file replaces header file <math.h>.
<cstdlib>	Contains function prototypes for conversions of numbers to text, text to numbers, memory allocation, random numbers and various other utility functions. This header file replaces header file <stdlib.h>.

<ctime>	Contains function prototypes and types for manipulating the time and date. This header file replaces header file <time.h>.
<cctype>	Contains function prototypes for functions that test characters for certain properties (such as whether the character is a digit or a punctuation), and function prototypes for functions that can be used to convert lowercase letters to uppercase letters and vice versa. This header file replaces header file <ctype.h>
<cstring>	Contains function prototypes for C-style string-processing functions. This header file replaces header file <string.h>.
<cstdio>	Contains function prototypes for the C-style standard input/output library functions and information used by them. This header file replaces header file <stdio.h>.
<fstream>	Contains function prototypes for functions that perform input from files on disk and output to files on disk. This header file replaces header file <fstream.h>.
<climits>	Contains the integral size limits of the system. This header file replaces header file <limits.h>.
<cassert>	Contains macros for adding diagnostics that aid program debugging. This replaces header file <assert.h> from pre-standard C++.
<cfloat>	Contains the floating-point size limits of the system. This header file replaces header file <float.h>.
<string>	Contains the definition of class string from the C++ Standard Library

<vector>, <list>, <deque>, <queue>, <stack>, <map>, <set>, <bitset>	These header files contain classes that implement the C++ Standard Library containers. Containers store data during a program's execution.
<typeinfo>	Contains classes for runtime type identification (determining data types at execution time).
<exception>, <stdexcept>	These header files contain classes that are used for exception handling.
<memory>	Contains classes and functions used by the C++ Standard Library to allocate memory to the C++ Standard Library containers.
<sstream>	Contains function prototypes for functions that perform input from strings in memory and output to strings in memory.
<functional>	Contains classes and functions used by C++ Standard Library algorithms.
<iterator>	Contains classes for accessing data in the C++ Standard Library containers.
<algorithm>	Contains functions for manipulating data in C++ Standard Library containers.
<locale>	Contains classes and functions normally used by stream processing to process data in the natural form for different languages (e.g., monetary formats, sorting strings, character

	presentation, etc.).
<limits>	Contains classes for defining the numerical data type limits on each computer platform.
<utility>	Contains classes and functions that are used by many C++ Standard Library header files.

Mathematical Functions

Some of the important mathematical functions in header file <**cmath>** are

Function	Meaning
sin(x)	Sine of an angle x (measured in radians)
cos(x)	Cosine of an angle x (measured in radians)
tan(x)	Tangent of an angle x (measured in radians)
asin(x)	Sin-1 (x) where x (measured in radians)
acos(x)	Cos-1 (x) where x (measured in radians)
exp(x)	Exponential function of x (ex)
log(x)	logarithm of x
log 10(x)	Logarithm of number x to the base 10
sqrt(x)	Square root of x
pow(x, y)	x raised to the power y
abs(x)	Absolute value of integer number x
fabs(x)	Absolute value of real number x

Character Functions

All the character functions require **<cctype>** header file. The following table lists the function.

Function	Meaning
isalpha(c)	It returns True if C is an uppercase letter and False if c is lowercase.
isdigit(c)	It returns True if c is a digit (0 through 9) otherwise False.
isalnum(c)	It returns True if c is a digit from 0 through 9 or an alphabetic character (either uppercase or lowercase) otherwise False.
islower(c)	It returns True if C is a lowercase letter otherwise False.
isupper(c)	It returns True if C is an uppercase letter otherwise False.
toupper(c)	It converts c to uppercase letter.
tolower(c)	It converts c to lowercase letter.