

Standard C Functions

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These slides introduces a few standard C functions

Standard Functions

- C standard functions
 - C function reference libraries
 - https://en.wikipedia.org/wiki/C_standard_library

Name	From	Description
<assert.h>		Contains the <code>assert</code> macro, used to assist with detecting logical errors and other types of bugs in debugging versions of a program.
<complex.h>	C99	A set of functions for manipulating complex numbers.
<ctype.h>		Defines set of functions used to classify characters by their types or to convert between upper and lower case in a way that is independent of the used character set (typically ASCII or one of its extensions, although implementations utilizing EBCDIC are also known).
<errno.h>		For testing error codes reported by library functions.
<fenv.h>	C99	Defines a set of functions for controlling floating-point environment.
<float.h>		Defines macro constants specifying the implementation-specific properties of the floating-point library.
<inttypes.h>	C99	Defines exact-width integer types.
<iso646.h>	NA1	Defines several macros that implement alternative ways to express several standard tokens. For programming in ISO 646 variant character sets.
<limits.h>		Defines macro constants specifying the implementation-specific properties of the integer types.
<locale.h>		Defines localization functions.
<math.h>		Defines common mathematical functions.
<setjmp.h>		Declares the macros <code>setjmp</code> and <code>longjmp</code> , which are used for non-local exits.
<signal.h>		Defines signal-handling functions.
<stdalign.h>	C11	For querying and specifying the alignment of objects.
<stdarg.h>		For accessing a varying number of arguments passed to functions.
<stdatomic.h>	C11	For atomic operations on data shared between threads.
<stdbool.h>	C99	Defines a boolean data type.
<stddef.h>		Defines several useful types and macros.
<stdint.h>	C99	Defines exact-width integer types.
<stdio.h>		Defines core input and output functions
<stdlib.h>		Defines numeric conversion functions, pseudo-random numbers generation functions, memory allocation, process control functions
<stdnoreturn.h>	C11	For specifying non-returning functions
<string.h>		Defines string-handling functions
<tgmath.h>	C99	Defines type-generic mathematical functions.
<threads.h>	C11	Defines functions for managing multiple threads, mutexes and condition variables
<time.h>		Defines date- and time-handling functions
<uchar.h>	C11	Types and functions for manipulating Unicode characters
<wchar.h>	NA1	Defines wide-string-handling functions
<wctype.h>	NA1	Defines set of functions used to classify wide characters by their types or to convert between upper and lower case

Standard Functions

- I/O Functions
 - C functions
 - #include <stdio.h>
 - printf()
 - scanf()

Standard Functions

- Math Functions

```
#include <math.h>
```

Standard Functions

- Math Functions

- Ceiling – $\text{ceil}(x)$

- $\text{ceilf}, \text{ceil}$

- Smallest integer value \geq the operand

- $\text{ceil}(4.5) \rightarrow 5$

- $\text{ceil}(-12.7) \rightarrow -12$

- Floor – $\text{floor}(x)$

- $\text{floorf}, \text{floor}$

- Largest integer value \leq the operand

- $\text{floor}(4.5) \rightarrow 4$

- $\text{floor}(-12.7) \rightarrow -13$

Standard Functions

- Math Functions

- Truncate – $\text{trunc}(x)$
 truncf , truncl

- Rounds toward 0

$\text{trunc}(4.5) \rightarrow 4$

$\text{trunc}(-12.7) \rightarrow -12$

- Round – $\text{round}(x)$
 roundf , roundl

- Rounds to nearest integer

$\text{round}(4.5) \rightarrow 5$

$\text{round}(-12.7) \rightarrow -13$

Standard Functions

- Math Functions

- Power – `pow(x,y)`
`powf, powl`
 - x to the power y

`pow(3.0, 4.0) → 81.0`

`pow(3.4, 2.3) → 16.687893`

- Square Root – `sqrt(x)`
`sqrtf, sqrtl`
 - Square root of x

`sqrt(25) → 5.0`

Standard Functions

- Math Functions
 - Absolute value – `abs(x)`, `fabs(x)`
`labs`, `llabs`, `fabsf`, `fabsl`

```
if(fabs(a-b) < 0.000001){
```