

Function Calls

Function Calls

□ syntax:

function-name (argument-list)

where *argument-list* is a comma separated list of zero or more expressions

□ most functions are called with a *specific* number of arguments

□ the value **returned** by a function call is a (sub)expression in its own right

□ `size + 1` yields a value (the sum)

□ so does `pow(z, 2.9)` (exponentiation)

Function Prototypes

- ❑ functions, like variables, must be declared before they are called
- ❑ function declarations are called **prototypes**
- ❑ a function prototype indicates:
 - ❑ data type of value returned by function
 - ❑ name of function
 - ❑ number and data types of arguments in function call
- ❑ examples:
 - ❑ `double pow(double x, double y);`
 - ❑ `void srand(int seed);`

The C Runtime Library

SECTION	PURPOSE
<code>stdio</code>	standard input output functions
<code>math</code>	mathematical functions
<code>ctype</code>	character manipulation functions
<code>string</code>	character string manipulation functions
<code>time</code>	data/time functions
<code>stdlib</code>	miscellaneous functions

Header Files

- suppose a program needs to call many functions from the `math` section of the C runtime library

```
double sqrt(double x);  
double pow(double x, double y);  
double sin(double x);
```

- C programmers would avoid writing these prototypes by including the `math header` file

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

- each run time library section has a header file which contains the prototypes (and some defined constants) of all of the functions in the library section

Examples of Function Calls

- ❑ `hypotenuse = sqrt(side1 * side1 + side2 * side2);`
- ❑ `amount = principal * pow((1 + rate), term);`
- ❑ `ch = getchar();`
- ❑ `putchar(ch);`
- ❑ `dieRoll = rand() % 6 + 1;`
- ❑ `srand(time(NULL));`

Textbook Reading

- ❑ sections 5.1 and 5.2 introduce functions
- ❑ section 5.3 lists some commonly used functions from the `math` section of the C run time library
- ❑ function prototypes are found in section 5.6
- ❑ header files are covered in section 5.7
- ❑ details about random number generation are explained in sections 5.9 and 5.10

Summary

- ❑ function calls are (sub)expressions
- ❑ function prototypes are used to declare functions
- ❑ many useful functions are contained in the C run time library
- ❑ include header files to avoid having to write prototypes for run time library functions