

# Chapter 2 - Getting Started in C Programming

## At a Glance

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## Chapter Notes

### Overview

Chapter 2 provides an introduction to C programming. You learn about good programming style and about the data types available in C. You also learn about arithmetic operations, and how to declare and initialize variables. You put to practice the concepts learned through a case study on temperature conversion. Finally, you learn about some common programming and compiler errors, and how to avoid them.

### Objectives

- Introduction to C programming
- Programming style
- Data types
- Arithmetic operations
- Variables and declarations
- Case Study: Temperature conversion
- Common programming and compiler errors

## Topic Tips

### Introduction to C Programming

<b>Topic Tip</b>	In a computer language, a <i>token</i> is the smallest unit of the language that has a unique meaning. Thus, the reserved words, programmer-defined identifiers, and all special mathematical symbols, such as + and -, are considered tokens of the C language.
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<b>Topic Tip</b>	What if you want to include the backslash character in a string? Just precede it with another backslash, as “\\”.
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### Programming Style

<b>Topic Tip</b>	For a brief overview of different indentation styles, see <a href="http://en.wikipedia.org/wiki/Indent_style">http://en.wikipedia.org/wiki/Indent_style</a> .
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## Quick Quiz 1

1. What is an identifier?
2. What is a function header line?
3. The two characters \ and n, when used together, are called a(n) \_\_\_\_\_.
4. A(n) \_\_\_\_\_ is a word that is predefined by the programming language for a special purpose and can only be used in a specified manner for its intended purpose.

### Data Types

<b>Topic Tip</b>	For a discussion on the meaning of the term <i>precision</i> , see the box on page 64.
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## Quick Quiz 2

1. What is a data type?

2. In numerical theory, the term \_\_\_\_\_ typically refers to numerical accuracy.
3. What is an expression?
4. \_\_\_\_\_ is the order in which operators of the same precedence are evaluated.

## Variables and Declarations

### *Topic Tip*

Several tips on how to select variable names have been provided throughout this chapter. Try to describe the ones you can remember and write the list on a sheet of paper. Next, add any other tips missing from the list (see the Programming Note on page 82).

## Quick Quiz 3

1. \_\_\_\_\_ are simply names given by programmers to computer storage locations.
2. What is an assignment statement?
3. What is a definition statement?
4. When a declaration statement provides an initial value, the variable is said to be \_\_\_\_\_.

## Additional Resources

1. Indent Style:  
[http://en.wikipedia.org/wiki/Indent\\_style](http://en.wikipedia.org/wiki/Indent_style)
2. C/C++ Data Types:  
[http://www.cppreference.com/data\\_types.html](http://www.cppreference.com/data_types.html)
3. C Tutorial - Lesson 2: Variables:  
<http://cplusplus.about.com/od/beginnerctutorial1/l/aa030302a.htm>
4. Operator Precedence:  
<http://computer.howstuffworks.com/c37.htm>

## Key Terms

参数	➤ Items passed to a function are always placed within the function name parentheses and are called <b>arguments</b> .
函数参数	➤ Data transmitted into a function at run time are referred to as <b>arguments of the function</b> .
赋值语句	➤ The operators used for arithmetic operations are called <b>arithmetic operators</b> .
可结合性	➤ An <b>assignment statement</b> tells the computer to assign a value to (that is, store a value in) a variable.
二元运算	➤ <b>Associativity</b> is the order in which operators of the same precedence are evaluated.
内建数据类型	➤ <b>Binary operators</b> require two operands to produce a result.
注释	➤ A <b>built-in data type</b> is one that is provided as an integral part of the language.
控制说明符	➤ A <b>comment</b> is a note about the code that the programmer includes so that he (or other programmers) can keep track of what the various parts of the program do.
转换控制序列	➤ A control string is referred to as a <b>control specifier</b> .
转换规范、格式说明符	➤ A string that also includes a <b>conversion control sequence</b> , such as %d, is termed a <b>control string</b> .
数据类型	➤ Conversion control sequences are also referred to as <b>conversion specifications</b> and <b>format specifiers</b> .
定义语句	➤ A <b>data type</b> is defined as a set of values <i>and</i> a set of operations that can be applied to these values.
双精度	➤ <b>Definition statements</b> define or tell the compiler how much memory is needed for data storage.
驱动函数	➤ A double value is sometimes referred to as a <b>double-precision</b> number.
转义字符	➤ The main() function is sometimes referred to as a <b>driver function</b> , because it tells the other functions the sequence in which they are to operate.
转义序列	➤ The backslash character, \, is also known as the <b>escape character</b> .
可执行语句	➤ The combination of a backslash and one of several specific characters is called an <b>escape sequence</b> .
表达式	➤ All statements that cause some specific action to be performed by the computer when the function is executed must end with a semicolon (;); such statements are known as <b>executable statements</b> .
浮点表达式	➤ An <b>expression</b> is any combination of operators and operands that can be evaluated to yield a value.
浮点数, 实数	➤ An expression containing only floating-point values (single and double precision) as operands is called a <b>floating-point expression</b> (the term <b>real expression</b> is also used), and the result of such an expression is a double-precision value.
函数的头行	➤ A <b>floating-point value</b> , which is also called a <b>real number</b> , can be the number zero or any positive or negative number that contains a decimal point.
头文件	➤ A <b>function header line</b> , which is always the first line of a function, contains three pieces of information: (1) what type of data, if any, is returned by the function, (2) the name of the function, and (3) what type of data, if any, is sent into the function.
标识符	➤ A <b>header file</b> is placed at the top, or head, of a C program using the #include command.
初始值	➤ The names of functions, as well as all of the words permitted in a program that have special meaning to the compiler, such as radius and circumference, are collectively referred to as <b>identifiers</b> .
	➤ Declaration statements can also be used to store an initial value into declared variables; this value is referred to as an <b>initial value</b> .

初始化	➤ When a declaration statement provides an initial value, the variable is said to be <b>initialized</b> .
调用函数	➤ <b>Invoking</b> a function is more commonly referred to as <b>calling the function</b> .
关键字	➤ Reserved words are also referred to as <b>keywords</b> in C.
字面值	➤ A <b>literal</b> is an acceptable value for a data type.
字面值或常数	➤ Another name for a literal is a <b>literal value</b> , or <b>constant</b> .
混合模式表达式	➤ An expression containing both integer and floating-point values is called a <b>mixed-mode expression</b> .
模子、余数运算符	➤ The % operator, called both the <b>modulus</b> and <b>remainder operator</b> , captures the remainder when an integer number is divided by an integer.
嵌套	➤ Under no circumstances may comments be <b>nested</b> —one comment containing another comment.
换行转义序列	➤ The two characters \ and n, when used together, are called a <b>newline escape sequence</b> .
操作数	➤ An <b>operand</b> can be either a literal value or an identifier that has a value associated with it.
精度	➤ Inputting data or messages to a function is called <b>passing data to the function</b> .
原始类型	➤ In numerical theory, the term <b>precision</b> typically refers to numerical accuracy.
程序员创建标识符	➤ Built-in types are also known as <b>primitive types</b> .
限定词	➤ A large number of the identifiers used in a C program are selected by the programmer, and are known as <b>programmer-created identifiers</b> or <b>programmer-created names</b> .
保留字	➤ The keywords short, long, and unsigned are known as <b>qualifiers</b> , because they qualify the meaning of the keyword int.
带符号数据类型	➤ A <b>reserved word</b> is a word that is predefined by the programming language for a special purpose and can only be used in a specified manner for its intended purpose.
简单二元算术运算	➤ short int, int, and long int data types are formally referred to as <b>signed data types</b> .
单精度	➤ A <b>simple binary arithmetic expression</b> consists of a binary arithmetic operator connecting two literal values in the form: literalValue operator literalValue.
标准标识符	➤ A float value is sometimes referred to as a <b>single-precision</b> number.
字符串	➤ <b>Standard identifiers</b> are words that are predefined in C.
语法	➤ Messages are known as <b>strings</b> in C, because they consist of a string of characters made up of letters, numbers, and special characters.
一元运算	➤ A programming language's <b>syntax</b> is the set of rules for formulating statements that are "grammatically correct" for the language.
无符号数据类型	➤ A <b>unary operator</b> is one that operates on a single operand.
变量地址	➤ An <b>unsigned data type</b> provides only for nonnegative (that is, zero and positive) values.
变量	➤ The address of the first memory byte used for storing a variable is known as the <b>variable's address</b> .
空白	➤ <b>Variables</b> are simply names given by programmers to computer storage locations.
	➤ In C, <b>white space</b> refers to any combination of one or more blank spaces, tabs, or new lines.