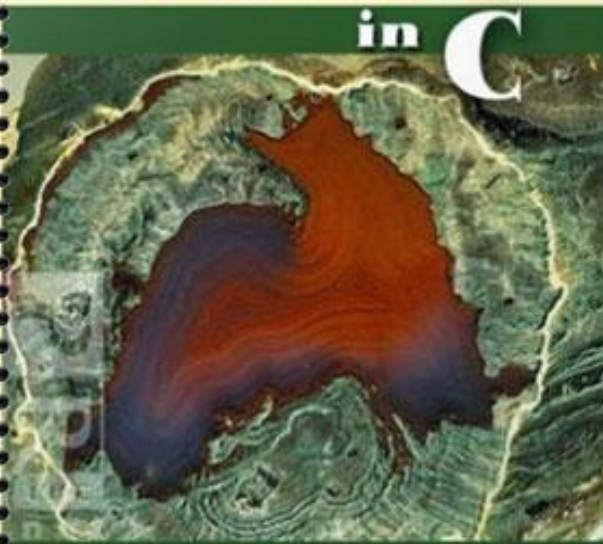SIXTH EDITION

PROBLEM SOLVING
AND
PROGRAM DESIGN

in C

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Test Bank

Problem Solving and Program Design in C Sixth Edition

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Chapter 1 Overview of Computers and Programming

True/False

1. All information that is to be processed by a computer must first be entered into memory via an input device.   [True]

2. A list of instructions provided to the computer is called a program.   [True]

3. Statements in a high-level language are converted to statements in machine language by a loader.

    [False]

4. Some files contain data for a program; others contain the program statements themselves.
                                                                                    [True]

5. A syntax error in a program is an error that causes the program to produce incorrect output.

    [False]

6. One task of an operating system is to provide input and output facilities to a program.

    [True]

7. When a program begins to execute, the contents of the memory cells it uses are initially empty.

    [False]

8. If the computer is switched off, data in secondary storage is usually not lost.   [True]

9. The data types used for storage of numeric data are digits, the sign, and the decimal point.

    [False]

10. Loading the operating system from disk into memory is called booting the computer.   [True]

Multiple Choice

1. Information stored in secondary storage is organized into aggregates called _____.

    a. hardware
    *b. files
    c. bytes
    d. memory cells
    e. none of the above

2. The part of the computer responsible for retrieving data and instructions from memory for processing is the _____.

    a. hardware
    b. loader
    *c. central processing unit
    d. linker
    e. instruction-data-fetch unit

3. The proper sequence of steps needed to correct invalid statements and reexecute a program is:

    a. Enter the editor, make corrections, link the program, reload the program, and save the program.
    b. Enter the editor, compile, load the program, correct statements, link the program, and save the program.
    c. Enter the editor, insert corrected statements, load, compile, and execute the program.
    *d. Enter the editor, correct invalid statements, save the program, compile, link, load, and execute the program.
    e. none of the above

4. The first electronic digital computer was designed in the late 1930s by _____.

    *a. John Atanasoff and Clifford Berry
    b. John von Neumann
    c. Steve Jobs and John Eckert
    d. Albert Einstein
    e. Niklaus Wirth

5. The Internet is an example of a _____.

    a. LAN
    *b. WAN
    c. CPU
    d. file server
    e. modem

6. An integrated circuit containing the full circuitry of a CPU is called a _____.

    a. mainframe

*b.   microprocessor
        c.   memory chip
        d.   supercomputer
        e.   RAM

7.   The component of a digital computer that can compare data stored in its registers is the
     _____.

        *a.   arithmetic-logic unit
        b.   logical comparison unit
        c.   cable Internet access
        d.   register bank
        e.   central logic unit

8.   Which of the following is not an advantage of a high-level language?

        a.   It is easier to use than machine language.
        b.   Its statements resemble English.
        c.   It is portable.
        d.   Memory can be referenced symbolically.
        *e.   It is easy for the machine to understand.

9.   The object file is created by the _____.

        a.   editor
        b.   linker
        c.   loader
        d.   central processing unit
        *e.   compiler

10. An application that provides the user with pictures and menus from which to select commands
     and data is said to have a(n) _____.

        *a.   GUI
        b.   command-line interface
        c.   IDE
        d.   CPU
        e.   compiler

Short Answer

1.   A(n) [byte] is the amount of memory required to store a single character.

2.   A(n) [bit] is the amount of memory required to store a single binary digit.

3.   [DSL] is a high-speed Internet connection that uses the wires of a telephone line and does
     not interfere with simultaneous voice communication on the same line.

4.   A(n) [icon] is a picture representing a computer operation.

5.   The compiler translates your program into [machine]   language.

6.   Data that is taken from the keyboard during program execution is called [input] data.

7.   A(n) [modem] converts computer data into audio tones that can be transmitted over a
     normal telephone circuit.

8.   The part of the computer that allocates memory and processor time is the [operating
     system] .

9.   A payroll report is an example of program [output] .

10. In a laboratory, several computers may be linked together on a local area [network] .

Chapter 2   Overview of C

True/False

1.   This assignment statement stores the sum of b and c in a: b + c = a;   [False]

2.   The word char is a reserved word in C so it cannot be used as a variable name.   [True]

3.   The directive
         #define FIVE 5
     notifies the C preprocessor that it is to replace each use of FIVE by 5.   [True]

4.   Before a new value can be stored in a memory cell, a C program must first execute the erase
     function to remove the cell's old contents.   [False]

5.   All values stored in memory are represented as binary strings, patterns of zeros and ones.
                                                                                         [True]

6.   The statement
         c = d;
     checks to see if variables c and d have the same value.   [False]

7.   If x is a type double variable and n is of type int, the following assignment statements
     are equivalent.
                                         x = n;   x =
     (double)n;   [True]

8.   If the value of x is 735, the statement
         printf("%4d", x);
     will display four blanks followed by 735.   [False]

9.   The value of the expression
         x + y * z * z
     is always the same as the value of
         x + ((y * z) * z)   [True]

10. A type char literal is enclosed in single quotes.

Multiple Choice

1. The constant 0.15e+6 represents the same value as _____.

    *a. 150000.0
    b. 6.15
    c. 0.75
    d. 0.21
    e. none of the above

2. What would be displayed by the following program? (The symbol '#' stands for one blank character.)

    ```
    int
    main(void)
    {
         double a, b;

         a = 37.56;
         b = 101.117;
         printf("Is it%6.1f%9.4f", a, b);
         printf("?\n");

         return (0);
    }
    ```

    a. Is#it##37.6#101.1170?\n
    *b. Is#it##37.6#101.1170?
    c. Is#it##37.5#101.1170?
    d. Is#it##37.6#101.117?\n
    e. none of the above

3. If num is a variable of type int and temp is a variable of type double, how could you correctly complete this function call?
             scanf("%lf%d", _____);

    a. num, temp
    b. &num, &temp
    c. temp, num
    *d. &temp, &num
    e. none of the above

4. Which of the following are valid identifiers?
             i. R3D3   ii. per-capita   iii. phone#
             iv. ice_cream   v. 92_aardvarks

    a. i, ii, iv, v
    *b. i, iv
    c. i, ii
    d. ii, iv, v
    e. All are valid.

5. The programming language C was developed by _____.

    a. John von Neumann
    b. John Atanasoff
    c. Niklaus Wirth
    *d. Dennis Ritchie
    e. Guy Steele

6. A _____ is a set of values and a set of operations on those values.

    a. file
    *b. data type
    c. precedence rule
    d. library
    e. language standard

7. Which one of the following expressions does not evaluate to 3?

    a. 2 + 16 % 5

```
*b.  7 - 15 / 4
 c.  6 * 5 / 10
 d.  2 - 4 * 3 + 26 / 2
 e.  8 - 5
```

8. Text enclosed in /* */ in a C program _____ .
    a. gives instructions to the processor
    b. declares memory requirements
    c. makes files available
    d. causes a syntax error
    *e. is ignored by the C compiler

9. A C compiler detects _____ .

    *a. syntax errors
    b. run-time errors
    c. result errors
    d. arithmetic faults
    e. all of the above

10. A program that uses prompting messages to direct the user's input is running in _____ .

    a. batch mode
    b. arithmetic/logic mode
    *c. interactive mode
    d. assembly language mode
    e. memory mode

Short Answer

1. [Reserved] words have special meaning in C and cannot be used to name variables.

2. In an interactive program, the statement
        printf("\n");
    has the effect of [moving the cursor to the beginning of the next line].

3. The value of the expression 5 + 6.6 / 2.2 * 0.5 is [6.5].

4. If the type int variable a and the type double variables b and c have values 403, 201.447,
    and -11.2 respectively, write a single statement that will display the following line of
    output (for clarity, a '#' is used to indicate one space).

            ##403#####201.45####-11.200

    [One answer: printf("%5d%11.2f%11.3f\n", a, b, c);]

5. What are the data requirements for a C program that prompts the user to enter the radius of
    a circle and displays the circle's circumference?

    [Answer:
         problem input   double radius   /* radius of circle */
         problem output   double circum   /* circumference of circle */
    ]

6. Write a complete C program that prompts the user to enter the radius of a circle and
    displays the circumference. Be sure to name the constant P.

    [Answer:

        #include <stdio.h>
        #define PI 3.14159

        int
        main(void)
        {
             double radius, circum;

             printf("Please enter radius of circle> ");
             scanf("%lf", &radius);
             circum = 2 * PI * radius;
```

```
            printf("The circumference is %.2f.\n", circum);

            return (0);
        }
    ]
```

7. What happens to the fractional part of a type double expression when the expression is assigned to a type int variable?

    [Answer: The fractional part is lost.]

8. The C statement that would store three integers keyed in by the user in the type int variables n1, n2, and n3 is [scanf("%d%d%d", &n1, &n2, &n3);] .

9. An expression that has operands both of type int and of type double is called a [mixed-type] expression.

10. Unary operators have [right] associativity; binary operators have [left] associativity.