Solutions to Chapter 1

Review Questions

1. b. False
3. b. False
5. a. True
7. a. Database management system
9. a. Assembly/symbolic
11. d. Source file
13. a. Flowchart

Exercises

15. The two major components of a computer system are hardware and software. The hardware component of the computer system is made of five parts: The input devices, central processing unit (CPU), primary storage or main memory, output devices, and auxiliary storage devices. The software consists of system software, which includes the operating system, and application software used to solve the user's business requirements.

17. In a time-sharing environment, each user has a terminal that does not have any processing capability of its own; all processing is done by a central computer. In a client/server environment, users have terminals that have some processing capabilities; a portion of the processing is done by the terminal workstation, and a portion is done by a central computer.

19. The operating system provides system services such as a user interface, file and database access, and communication services. Its primary purpose is system efficiency while providing user access to the hardware and applications.

21. General-purpose software can be used for more than one purpose. Examples include word processors, spreadsheets, and database management systems. Application-specific software solves a specific business problem and cannot be used for other purposes. Examples include personal finance systems and general ledger accounting systems.

23. Symbolic languages, often called assembly languages, provide mnemonics for machine instructions, data identifiers, and other objects such as functions. They allow the programmer to write program instructions that basically mirror the machine instructions. High-level languages, on the other hand, are machine independent and allow the user to concentrate on the problem being solved rather than the hardware on which it is being solved. Generally, each high-level language statement generates many machine language statements.

25.

a. System requirements: Define the requirements for the system.

b. Analysis: Evaluate alternative solutions to requirements.

c. Design: Describe the specific implementation for the problem.

d. Code: Prepare and unit test programs based on the design.

e. System test: Verify that the programs integrate and work as a system to satisfy the user requirements.

f. Maintenance: Keep the system working in production.

27. The four steps to develop a program are:

- **a.** Understand the problem.
- **b.** Develop a solution.
- **c.** Write the program.
- **d.** Test the program.

29. "Resist the temptation to code" means that the programmer must fully understand the problem and design a solution before beginning the process of writing code. It is human nature to want to get to the coding step as soon as possible, but this often leads to poorly implemented and inefficient programs.

31. Software engineering is the use of sound engineering methods and principles to develop software that works.

Problems

33. No standard answer.