Computer Hardware

- Memory
  - Made up of memory cells – identified by memory addresses (ordered) – made up of bytes
    - Can contain program instructions or data for a program

Computer Hardware

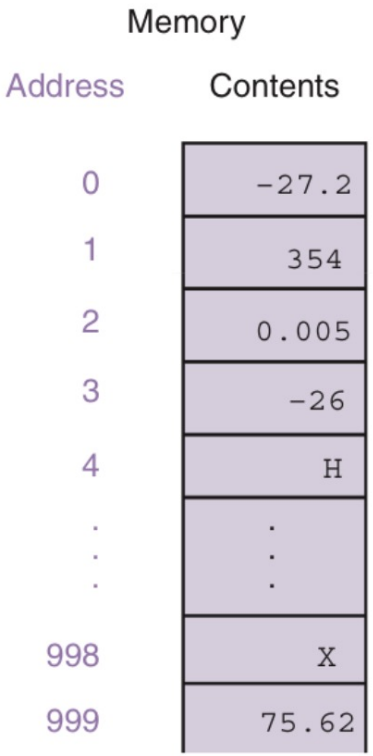

FIGURE 1.4

1000 Memory Cells in Main Memory

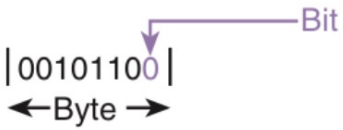

FIGURE 1.5

Relationship Between a Byte and a Bit

Computer Hardware

- Memory
  - Made up of memory cells – identified by memory addresses (ordered) – made up of bytes
    - Can contain program instructions or data for a program
  - Main memory
    - Contains program instructions, data and results
    - RAM – temporary storage for programs and their data – goes away when turned off
      - data/operations move in and out of RAM
    - ROM – stores info permanently – like start up information needed, burned in at factory
  - Secondary memory – hard drive, flash drive, DVD
- Central Processing Unit – coordinates all computer operations and performs arithmetic and logical operations on data
  - Operations include those in a program or those in the OS
- Input devices – keyboard, mouse
- Output devices – screen, printer

Computer Software

- Operating System
  - Communicates with user
  - Collects input
  - Sends the output to the right device
  - Manages memory, processes, software, hardware
  - Can have a text interface or a graphical interface
- Applications
  - Programs, programming languages
- Programming languages
  - Machine language, assembly language
  - High-level languages

How do you Create An Executable Program?

- Write source code in an editor
- Compile the source code into an object file (machine code)
  - Will detect syntax errors
- Link the object file(s) with other object files into the executable
  - Will detect if a reference can't be found
- Load the executable file into memory and initiates the execution of instructions in the executable

FIGURE 1.11

Entering, Translating, and Running a High-Level Language Program