COURSE TEXTBOOK

June J. Parsons and Dan Oja, *New Perspectives on Computer Concepts 11th Edition—Comprehensive*, Thomson Course Technology, a division of Thomson Learning, Inc Cambridge, MA, COPYRIGHT © 2008; ISBN-10: 1-4239-2518-1, ISBN-13: 978-1-4239-2518-7.

ICT Hardware/Software Requirements

- Microsoft Windows-based machine
- To see movie files Windows compatible sound card and speakers (or headphones) are needed.
- Visual Basic 6.0 or higher is required.
- Microsoft Access 2000 or higher is required.
- WinZip application is required.

Computer Systems

Lecture 2 (part 1)

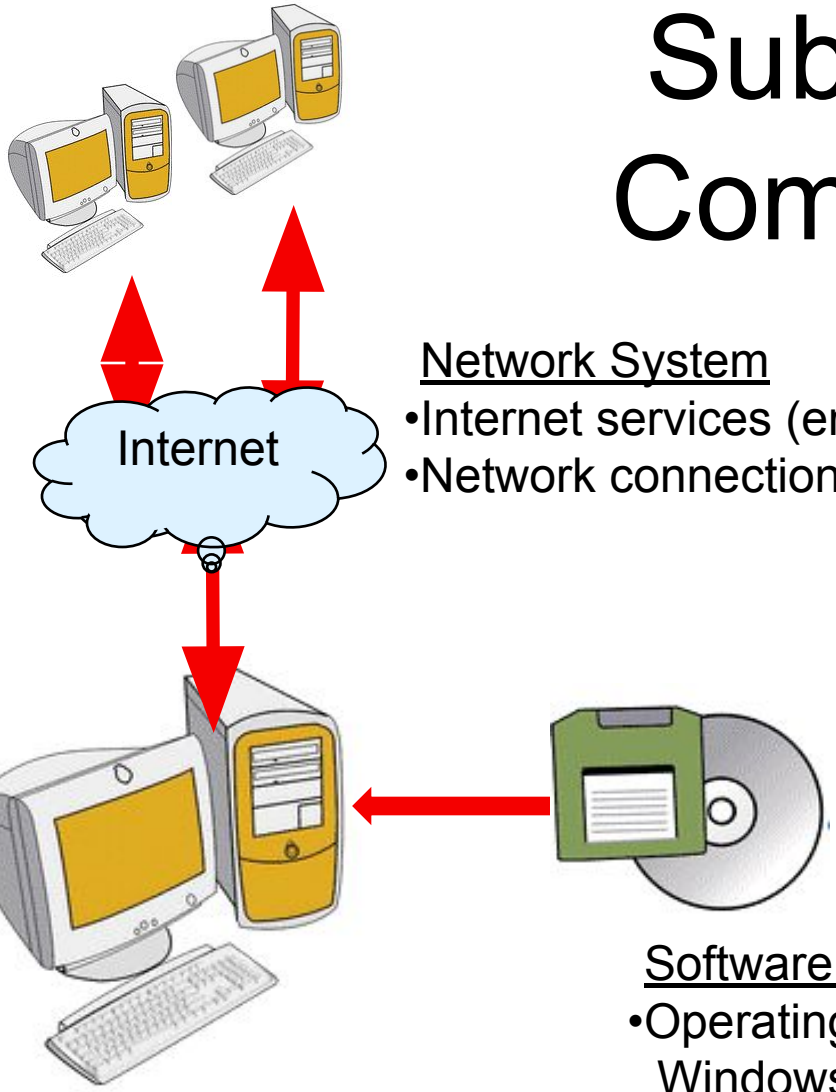
2.1 Overview of Computer Systems

2.2 Evolution of Computer Systems

2.1.1 Components of a Computer System

- Hardware System
- Software System—Operating System Software and Application Software
- Network System

Subsystems of a Computer

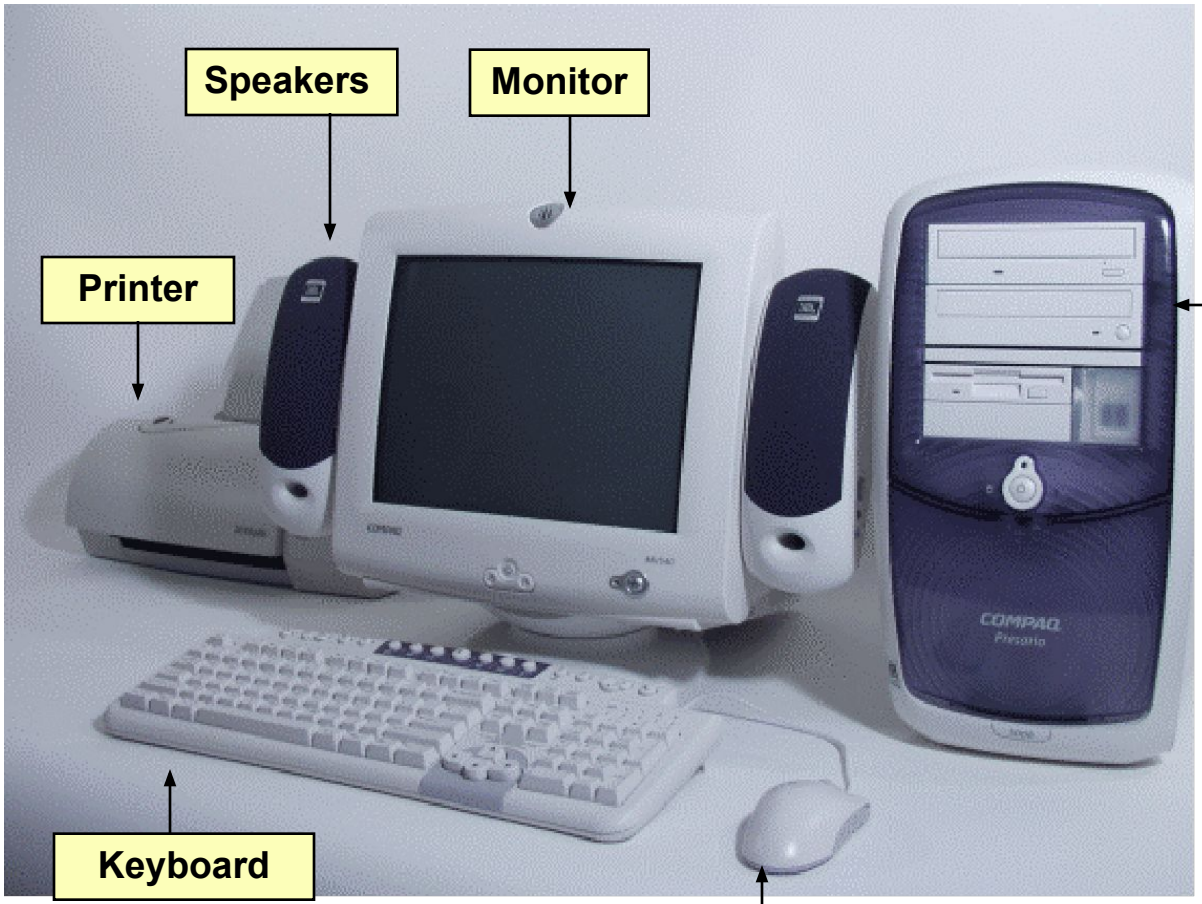


Network System
- Internet services (email)
- Network connections (modems, network cards)

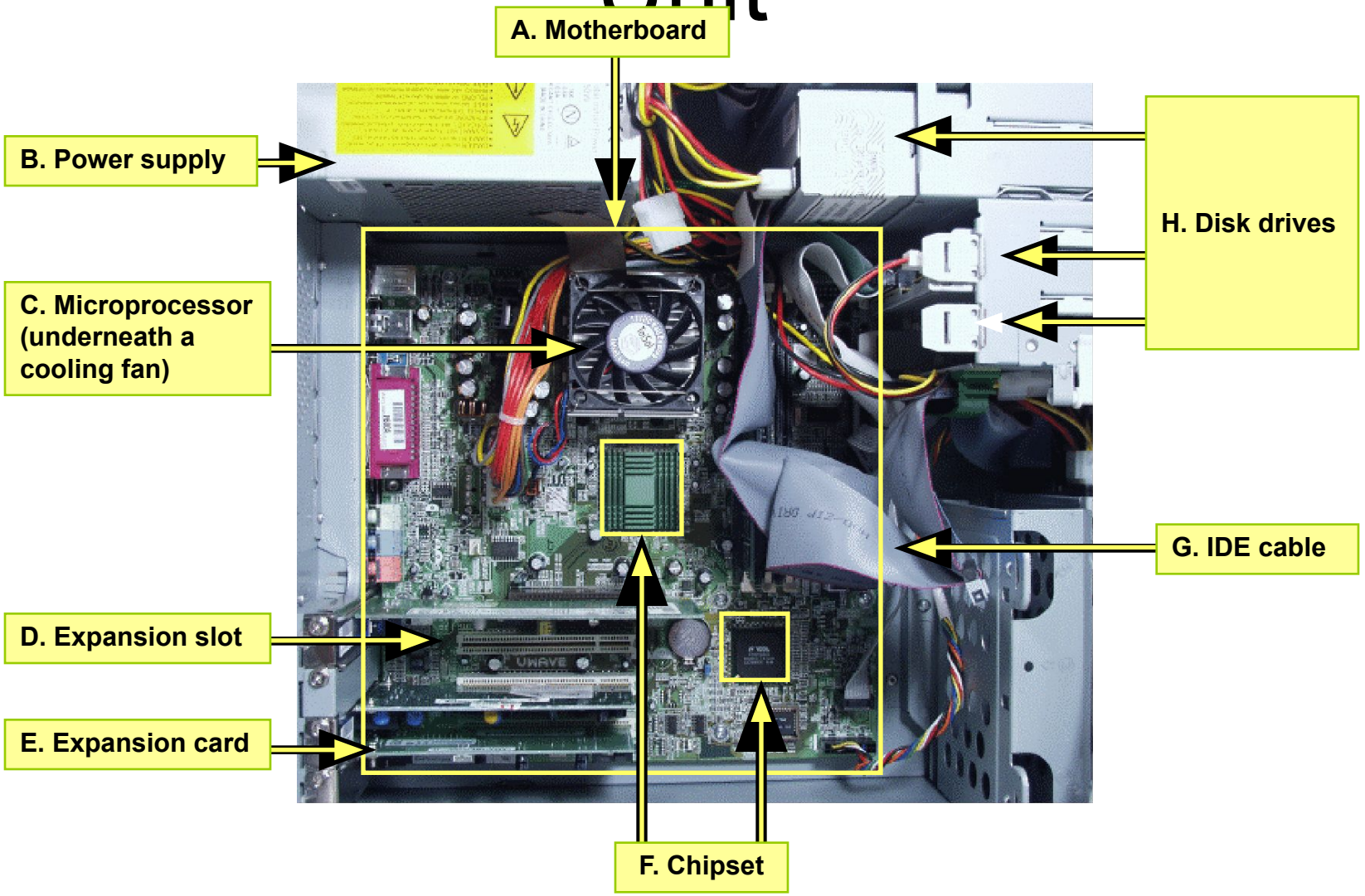
Software System
- Operating System (Unix, Mac OS, Microsoft Windows)
- Web browser (Firefox, Internet Explorer)
- Office productivity applications (Microsoft Office, Star Office)

Hardware System
- Keyboard
- Monitor
- System unit

Hardware System



Components inside the System Unit

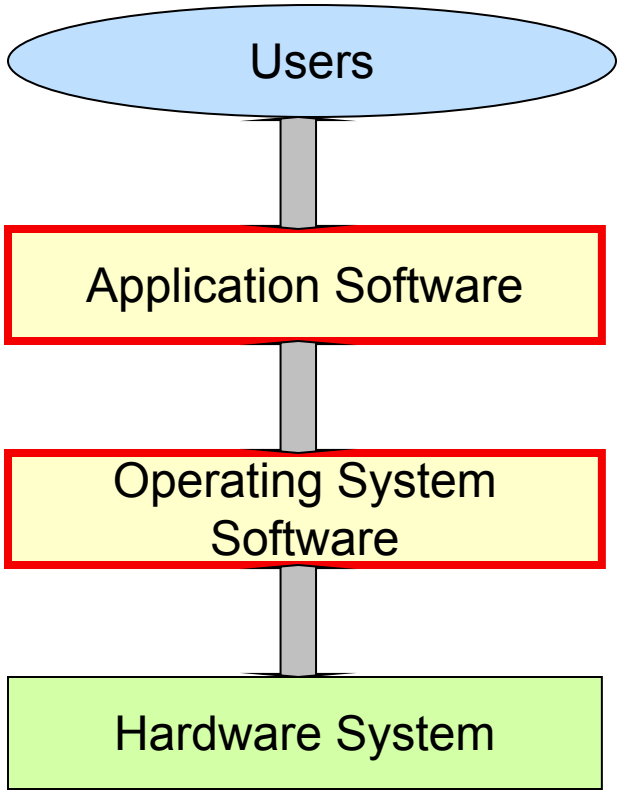


What is Software?

- Software is a set of computer instructions or data.
- Software receives input from the user and processes this input through the computer to produce output.
- Software directs how the computer interacts with the user.
- Software specifies how to process the user's data

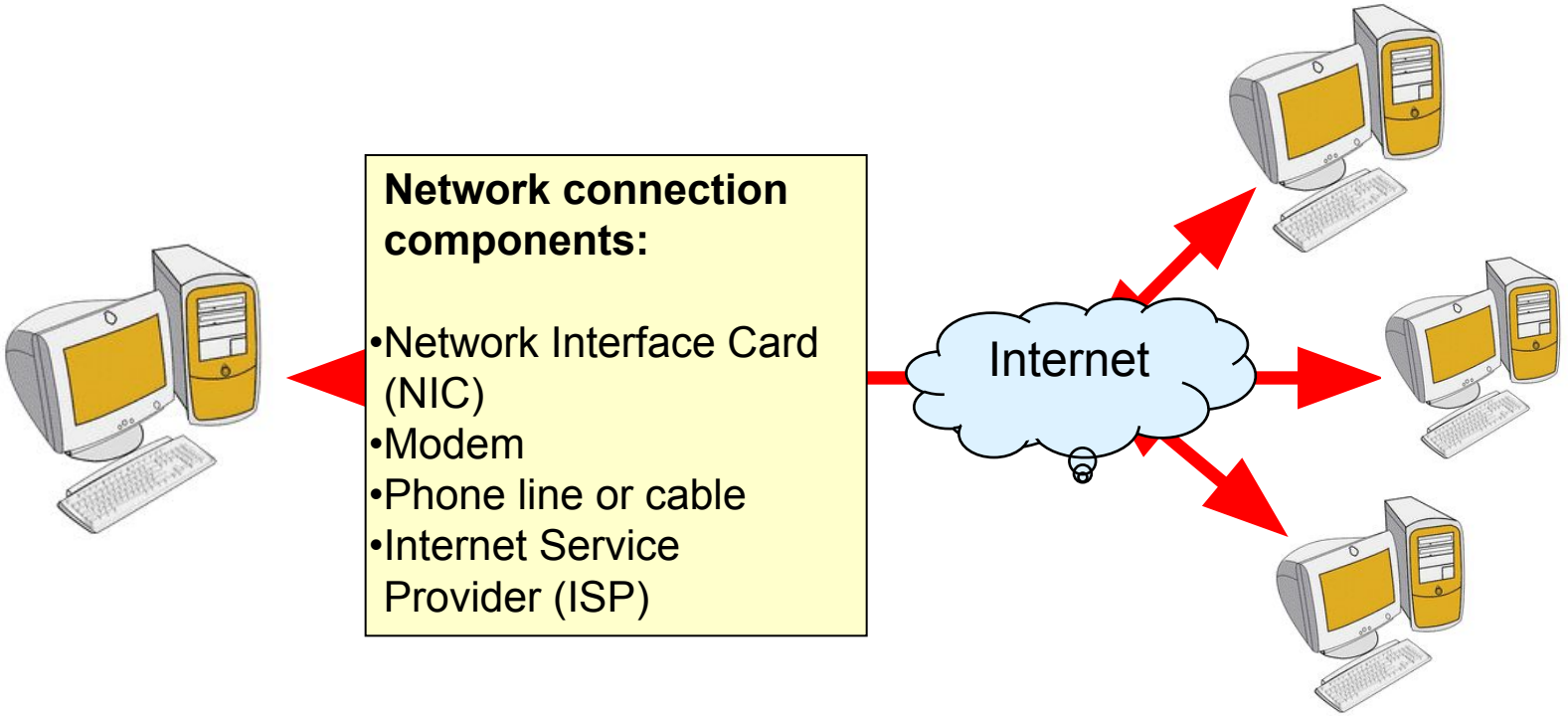
Software System

- Two categories: operating system (OS) software and application software.
- ***Operating system software***, also called system software, is the master controller for all activities that take place within a computer
  - Examples of OS software:
    - Microsoft Windows, Unix, Mac OS
- ***Application software*** is a set of one or more computer programs that helps a person carry out a task
  - Examples of application software:
    - Microsoft Word
    - Internet Explorer
    - Macromedia Dreamweaver
    - Adobe Acrobat Reader



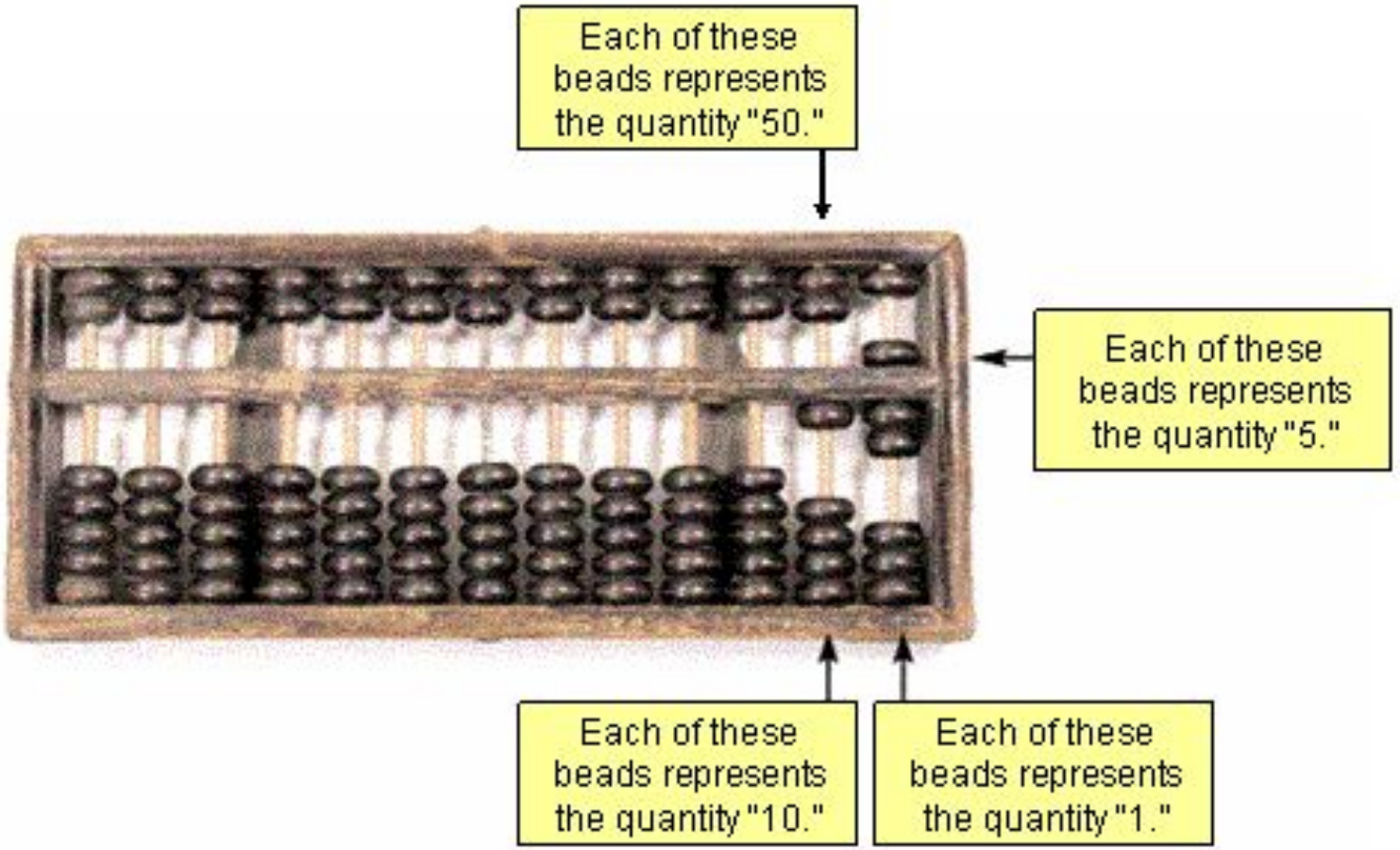
Network System

- A network provides connections among computers to enable computers on a network to share data (e.g. documents), hardware (e.g. printers), and software resources (e.g. application programs).
- Network users can also send messages to each other.
- A network must be secured to protect data from unauthorized usage (e.g. using login name and password to gain access to a network).


Network connection components:
•Network Interface Card (NIC)
•Modem
•Phone line or cable
•Internet Service Provider (ISP)
Internet

Evolution of Computers

- Needed calculation devices to keep track of accounting for commerce
- 1200s—Manual Calculating Devices: the ***abacus***


Each of these beads represents the quantity "50."
Each of these beads represents the quantity "5."
Each of these beads represents the quantity "10."
Each of these beads represents the quantity "1."

Evolution of Computers (continued)

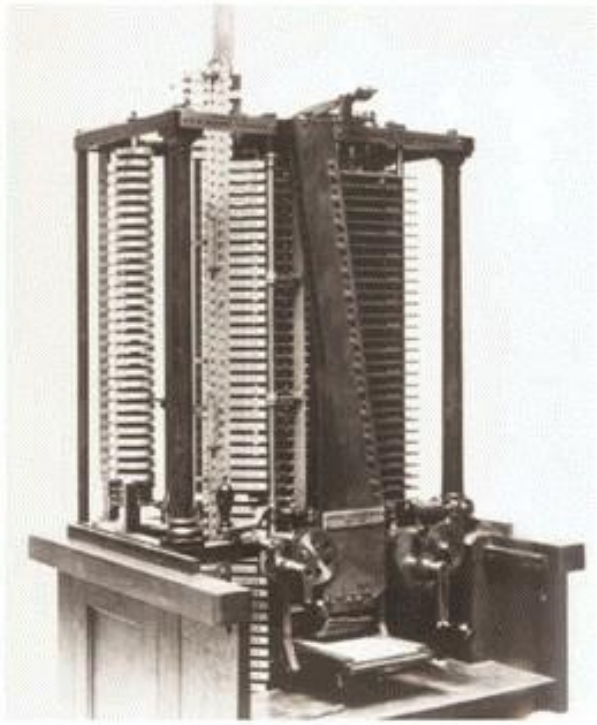
- 1600s—Mechanical Calculators
  - Used wheels, gears, and counters
  - To work a mechanical calculator, the operator enters the numbers for a calculation, and then pulls a lever or turns a wheel to carry out the calculation
  - Example: the Pascaline invented by Blaise Pascal. It used some principles of the abacus, but used wheels to move counters.

Evolution of Computers (continued)

- 1800s—Punched Cards
  - Used holes following a specific pattern to represent the instructions given to the machine or stored data
  - Different program instructions can be stored on separate punched cards, which can be fed through the computing machine repeatedly.
  - Once punched, the cards were fed into a card reader that used an array of metal rods to electronically read the data from the cards and tabulate the results. This is called the ***Hollerith Tabulating Machine***
  - Hollerith incorporated ***The Tabulating Machine*** better known today as ***IBM***.

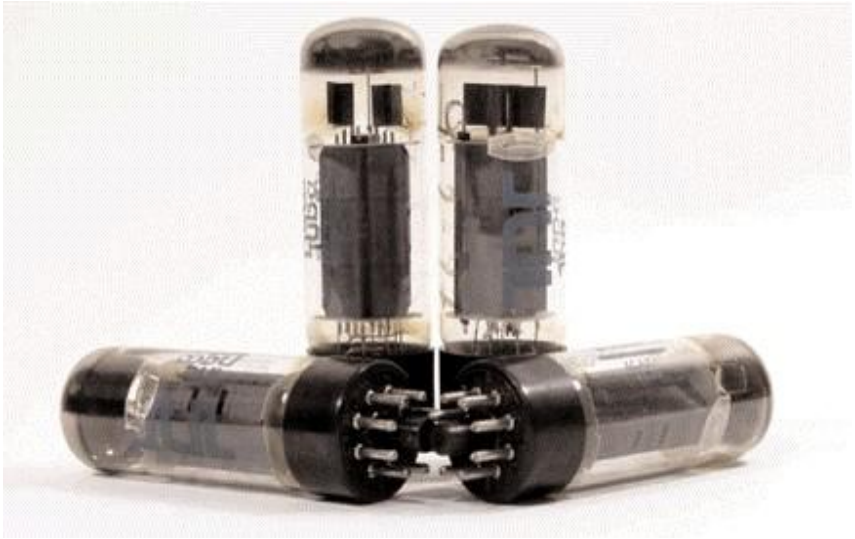
Evolution of Computers (continued)

- Charles Babbage designed a new general-purpose calculating device, the ***Analytical Engine***, which is the ancestor of modern computers.
  - It included the essential components of present-day computers, which are input, process, storage, and output of data.



Evolution of Computers (continued)

- 1940s—Vacuum Tubes
  - Used to control the flow of electrons. Since vacuum tubes responded faster than mechanical components, faster computations were possible. But, the tubes consumed a lot of power and burned out quickly.
  - The first computer prototype using vacuum tubes was ENIAC (Electronic Numerical Integrator and Computer). It was designed to calculate trajectory tables for the U.S. Army during World War II, but it was not completed until three months after the war.



Evolution of Computers (continued)

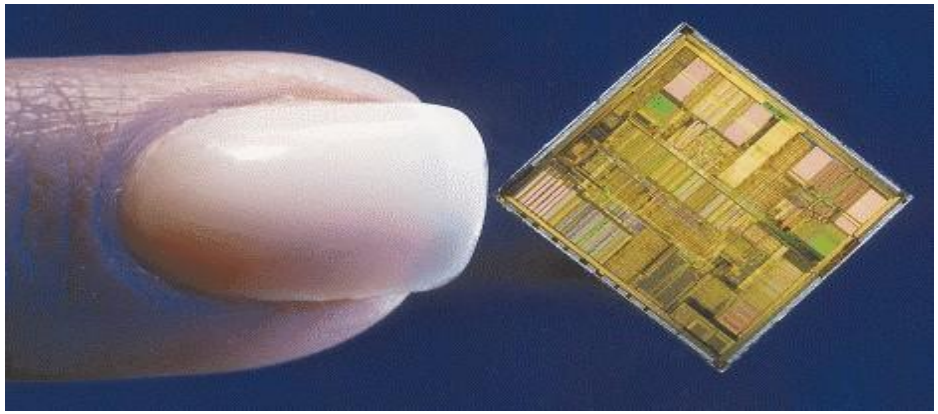
- 1950s—Transistors
  - Smaller, cheaper, more reliable, and consumed less power than vacuum tubes.
  - Could perform 200,000 to 250,000 calculations per second.

Evolution of Computers (continued)

- 1960s—Integrated Circuits
  - Thin slice of silicon packed with microscopic circuit elements such as wire, transistors, capacitors, and resistors.
  - Enabled the equivalent of thousands of vacuum tubes or transistors to be packed onto a single miniature chip about the size of your fingernail
  - Reduces the physical size, weight, and power requirements for devices such as computers

Evolution of Computers (continued)

- 1970s to Present—Microprocessor
  - Combined components of a computer on a microchip
  - Can be manufactured and then programmed for various purposes



Moore's Law

- Law can be stated as:

  Number of transistors on a microchip doubles every 18 months.
- Predictions based on Moore's Law
  - Processing power (speed) doubles every 18 months.
  - Storage capacity of RAM increases exponentially.

Applications of Computer Systems

- In Education
  - Multimedia-Facilitated Learning
  - Simulation-Based Education
  - Intelligent Machine-Based Training
  - Interactive Learning
- In Business
  - Supply Chain Management
  - Project Management
  - Customer Relationship Management
  - Sales and Marketing Using Electronic Commerce
  - Manufacturing Research