

# CSE103

# Structured Programming

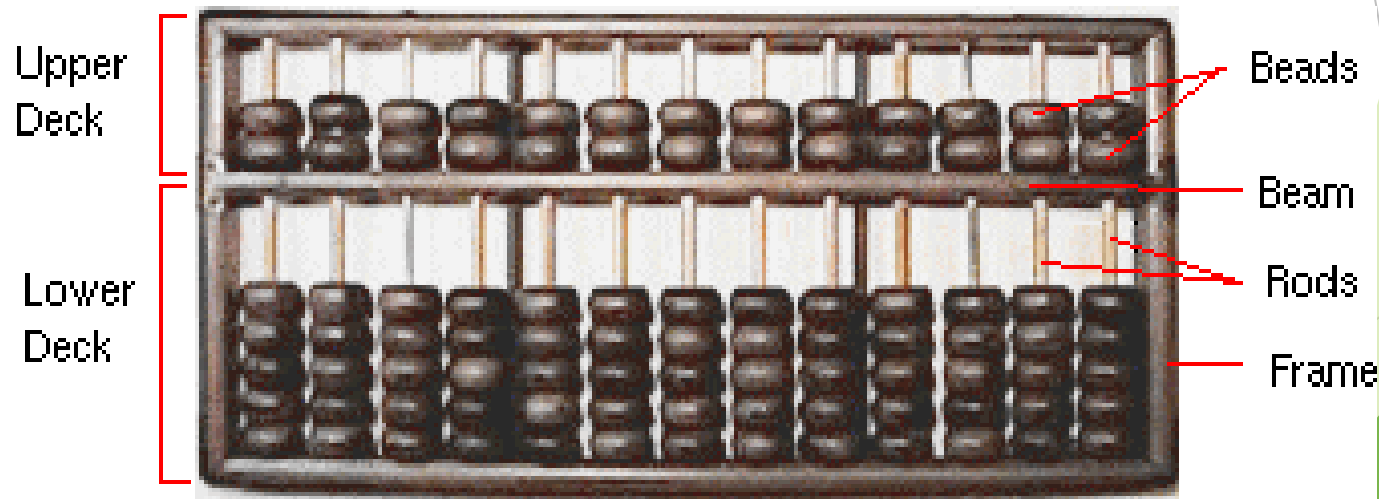
## Lecture-1



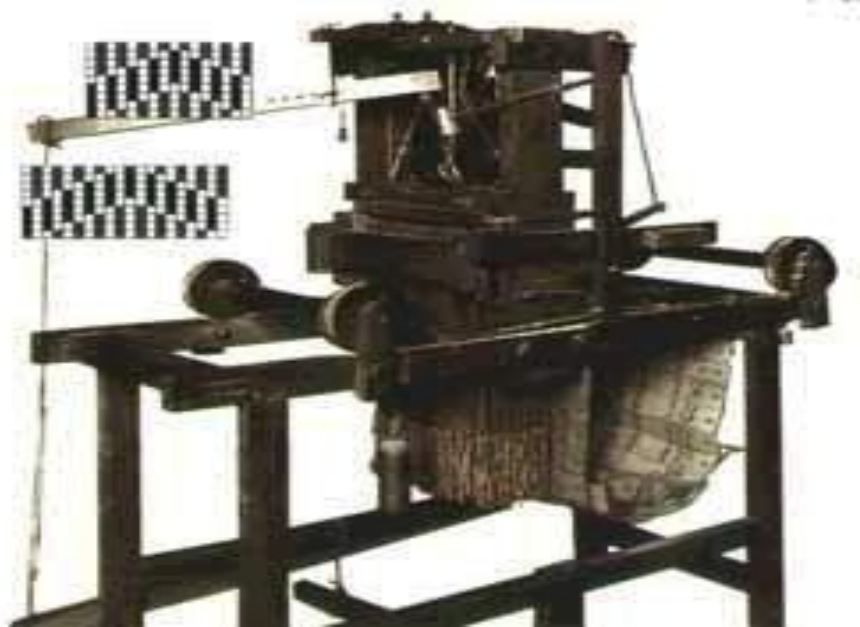
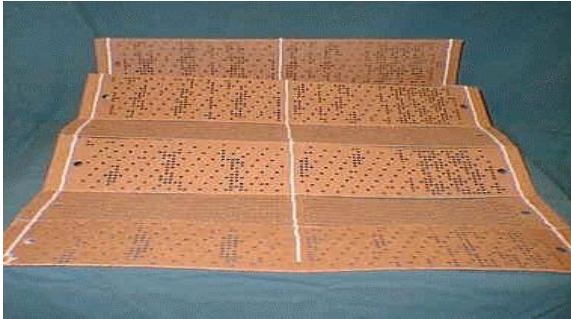
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# The Abacus

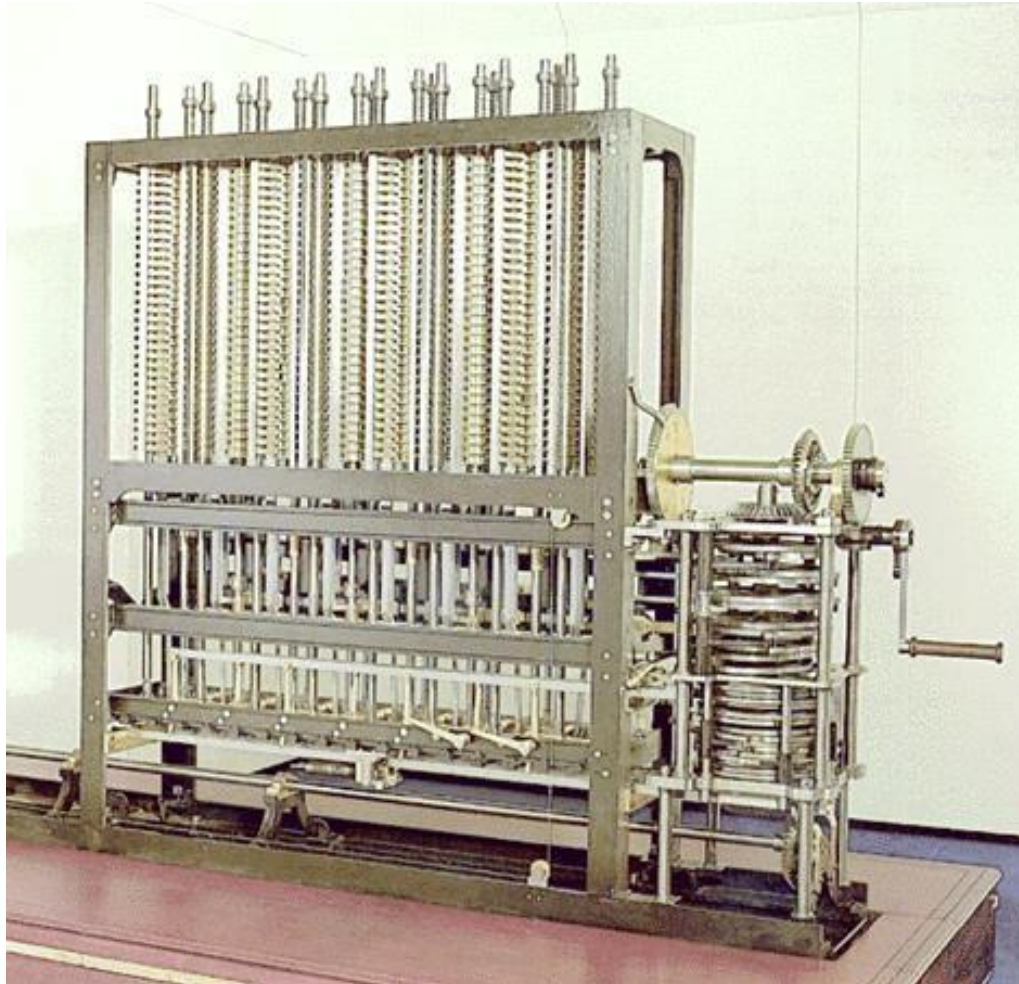
- The abacus, a simple counting aid, may have been invented in Babylonia (now Iraq) in the fourth century B.C.



# Jacquard Loom



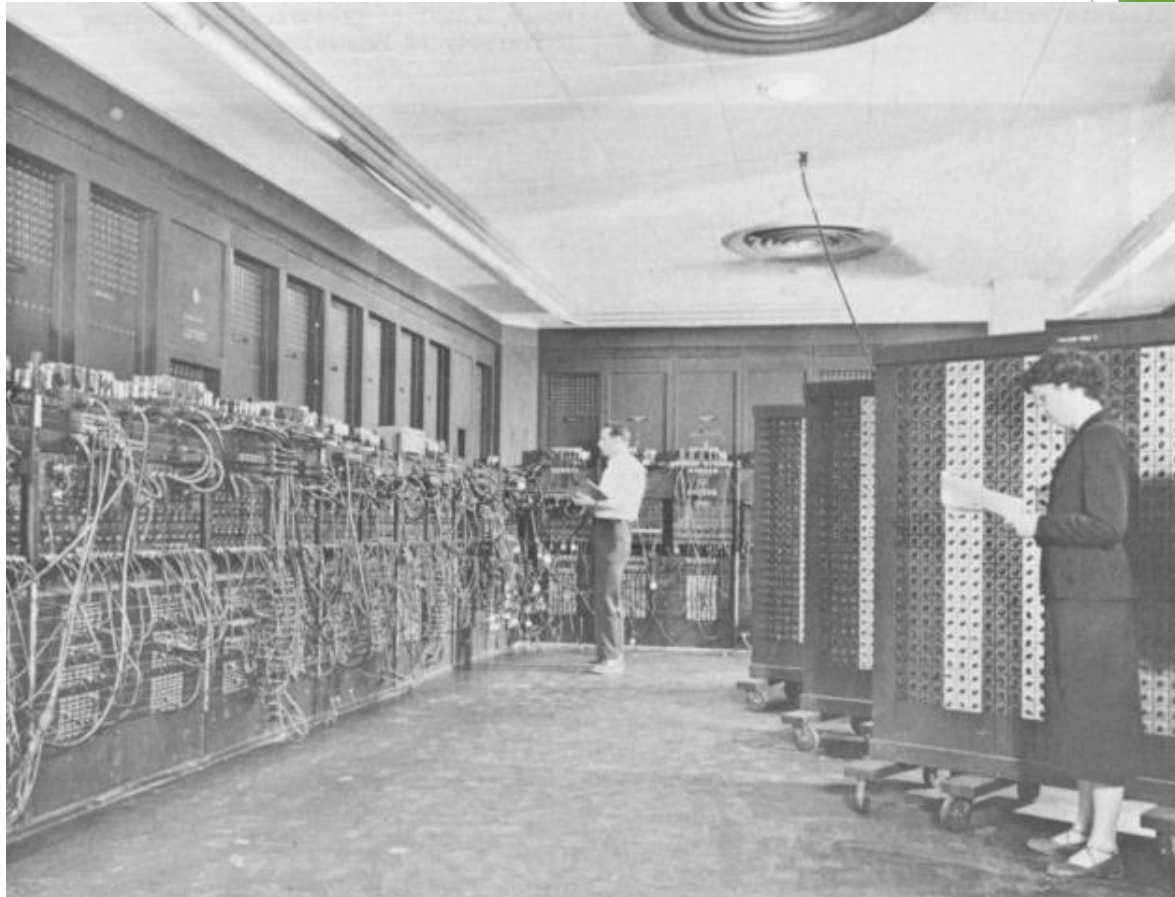
# Babbage Difference Engine, reconstructed by the British Government in 1991.



# The ENIAC

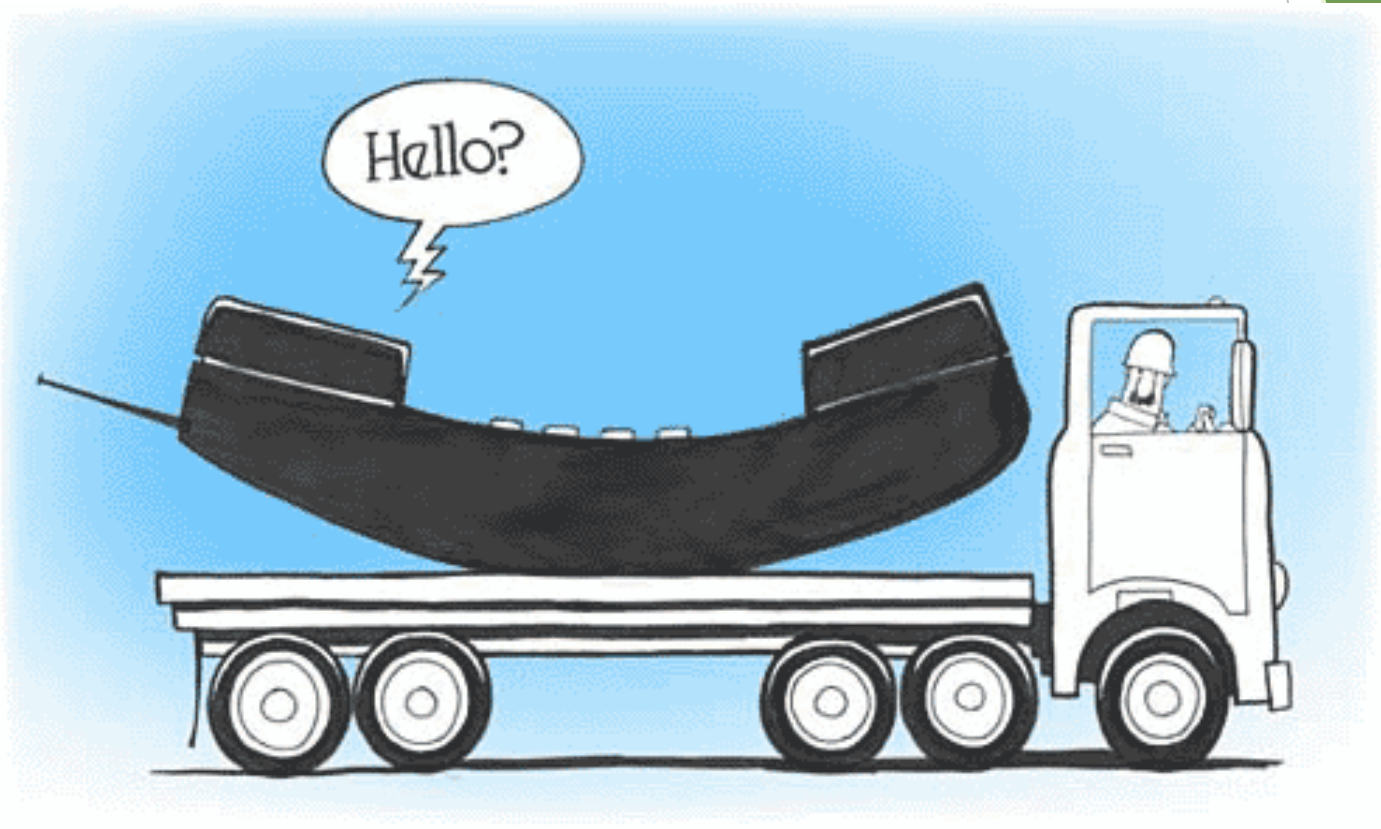


Vacuum  
Tube





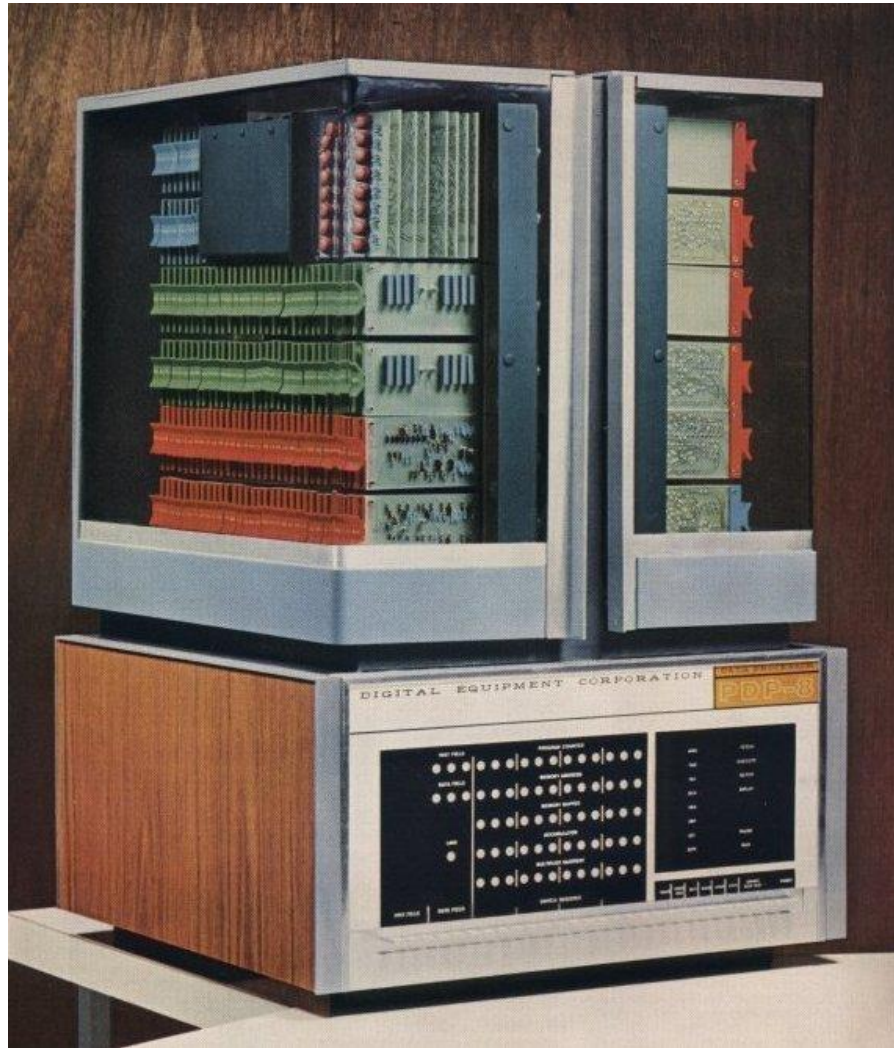
# The size of a cell phone built with Vacuum Tubes



# The IBM 360



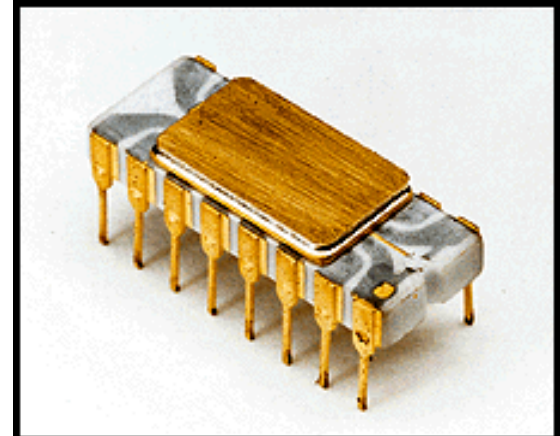
# The PDP-8





# The Microprocessor

- A computer chip that contains on it the entire CPU
  - Mass produced at a very low price
  - Computers become smaller and cheaper
- Intel 4004 – the first computer on a chip, more powerful than the original ENIAC.
- Intel 8088 – used in IBM PC



The Intel 4004, it was supposed to be the brains of a calculator. Instead, it turned into a general-purpose micro-processor as powerful as ENIAC.



# Hardware

- **Hardware** – the physical devices that make up a computer (often referred to as the computer system)



# Hardware Core

- CPU (Central Processing Unit)
  - **CPU (*machine*) cycle** – retrieve, decode, and execute instruction, then return result to RAM if necessary
  - CPU speed measured in gigahertz (GHz)
    - **GHz** – number of billions of CPU cycles per second
- RAM (Random Access Memory)
  - Also called Memory, Main Memory, or Primary Storage
  - Measured in gigabytes (GB, billions of bytes) today
    - Byte → Character
  - RAM is volatile
    - Temporary storage for instructions and data

# Capacity of Secondary Storage Devices

- **Kilobyte (KB or K)** – about 1 thousand bytes
- **Megabyte (MB or M or Meg)** – about 1 million bytes
- **Gigabyte (GB or Gig)** – about 1 billion bytes
- **Terabyte (TB)** – about 1 trillion bytes





# Software

- Programs - instructions that tell the computer what to do
- Categories
  - **Application software** - enables you to solve specific problems or perform specific tasks.
  - **System software** - handles tasks specific to technology management and coordinates the interaction of all technology devices
  - **Utility software** - provides additional functionality to
  - ▶ your operating system software

# System Software

- Operating System

- ☐ UNIX / Linux
- ☐ Windows
- ☐ MAC OS
- ☐ Palm OS
- ☐ Android



Mac



- Language Translators

- ☐ C, C++, Basic, Java, ...



- Device Drivers

# C Programming Language

- Developed at AT&T Bell Labs in early 1970s
- Unix also developed at Bell Labs
  - All but core of Unix is in C
- Standardized by American National Standards Institute (ANSI)



Bell Laboratories

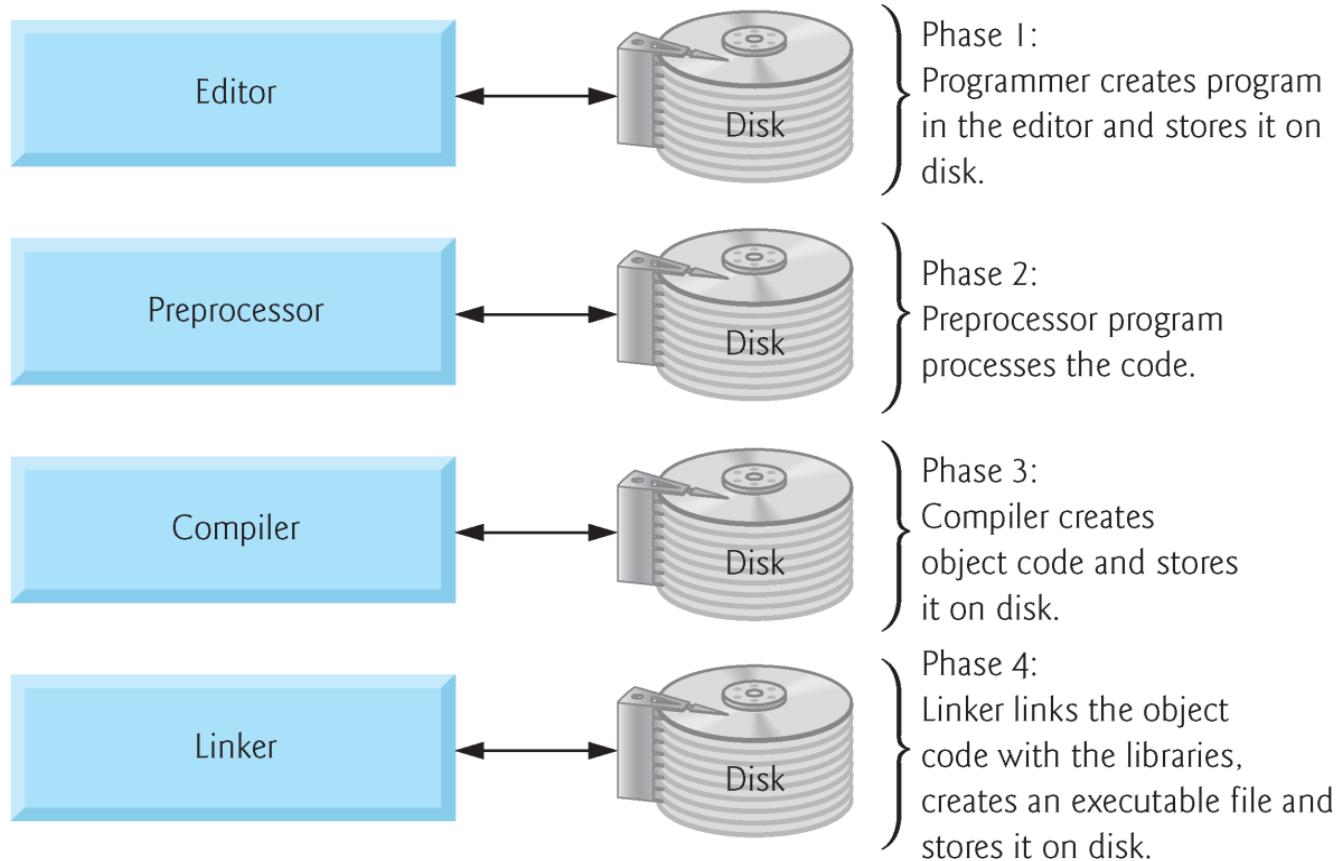


American National Standards Institute



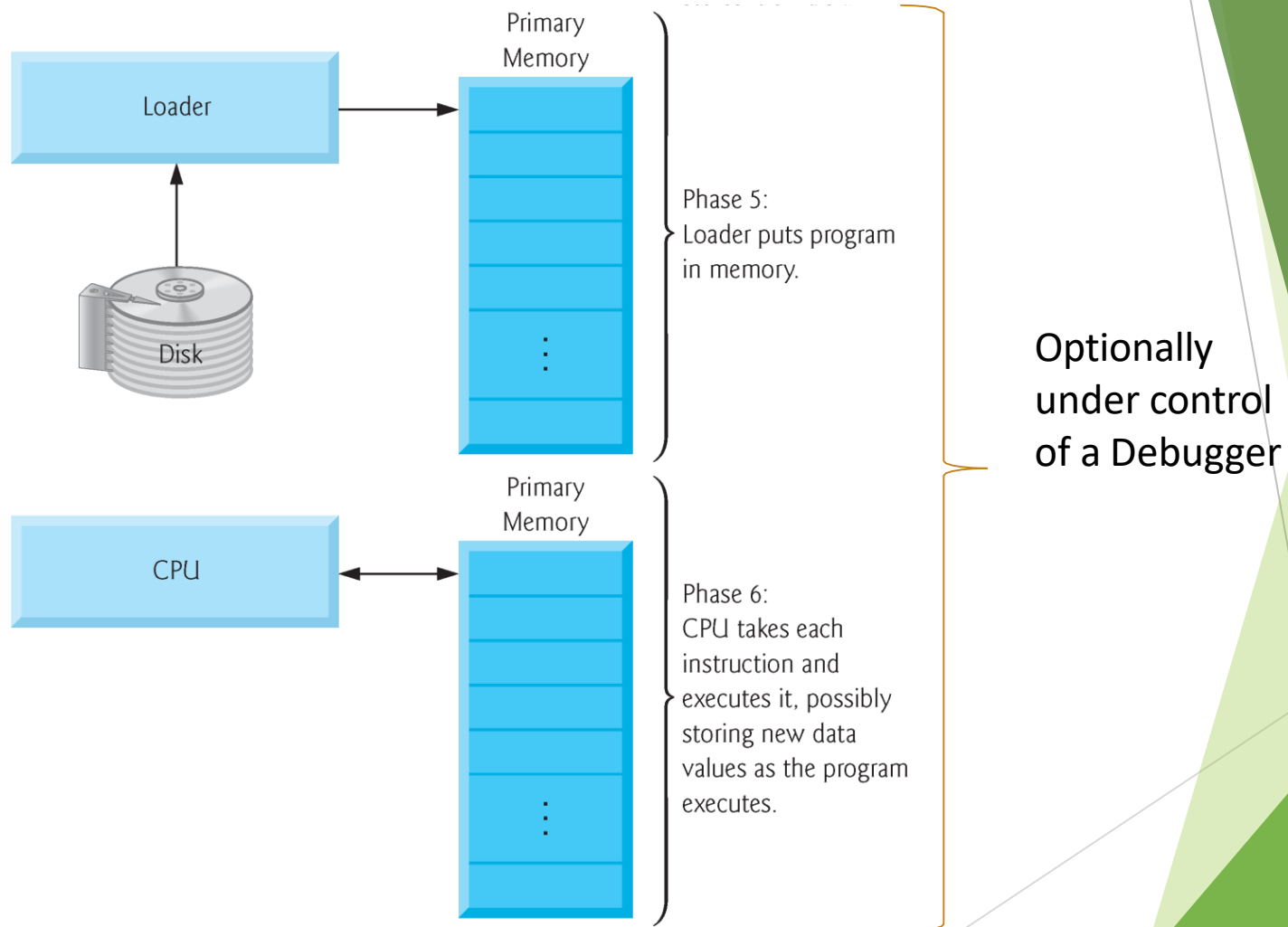
*Because C is a hardware-independent, widely available language, applications written in C can run with little or no modifications on a wide range of different computer systems.*

# C Development Environment





# Execution Environment



# IDE

- Integrated Development Environment

- ☐ Editor
- ☐ Compiler
- ☐ Debugger

- Ex:  
MS Visual C++  
Xcode

