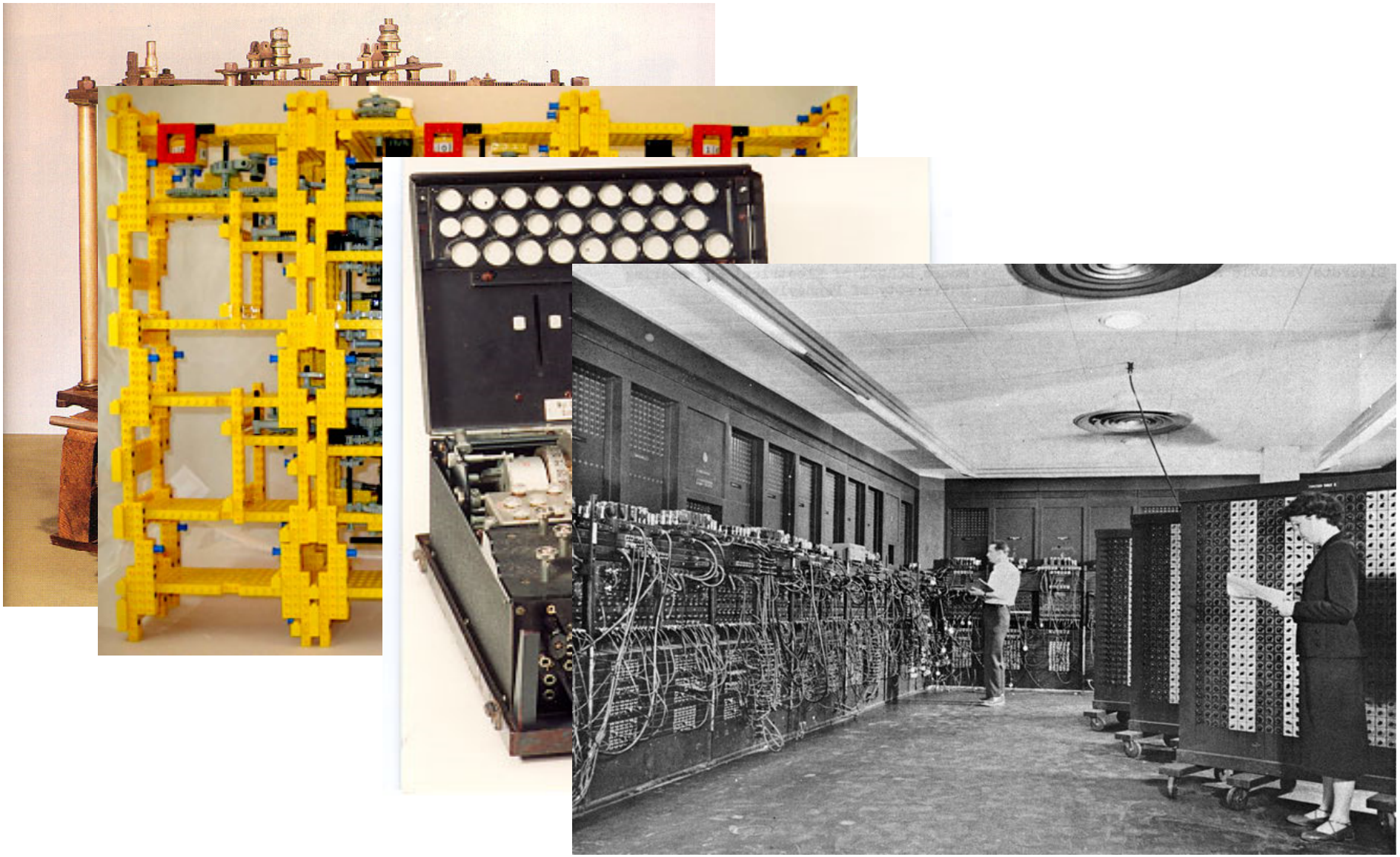
WIT COMP1000

Introduction to Computing

A Bit of History

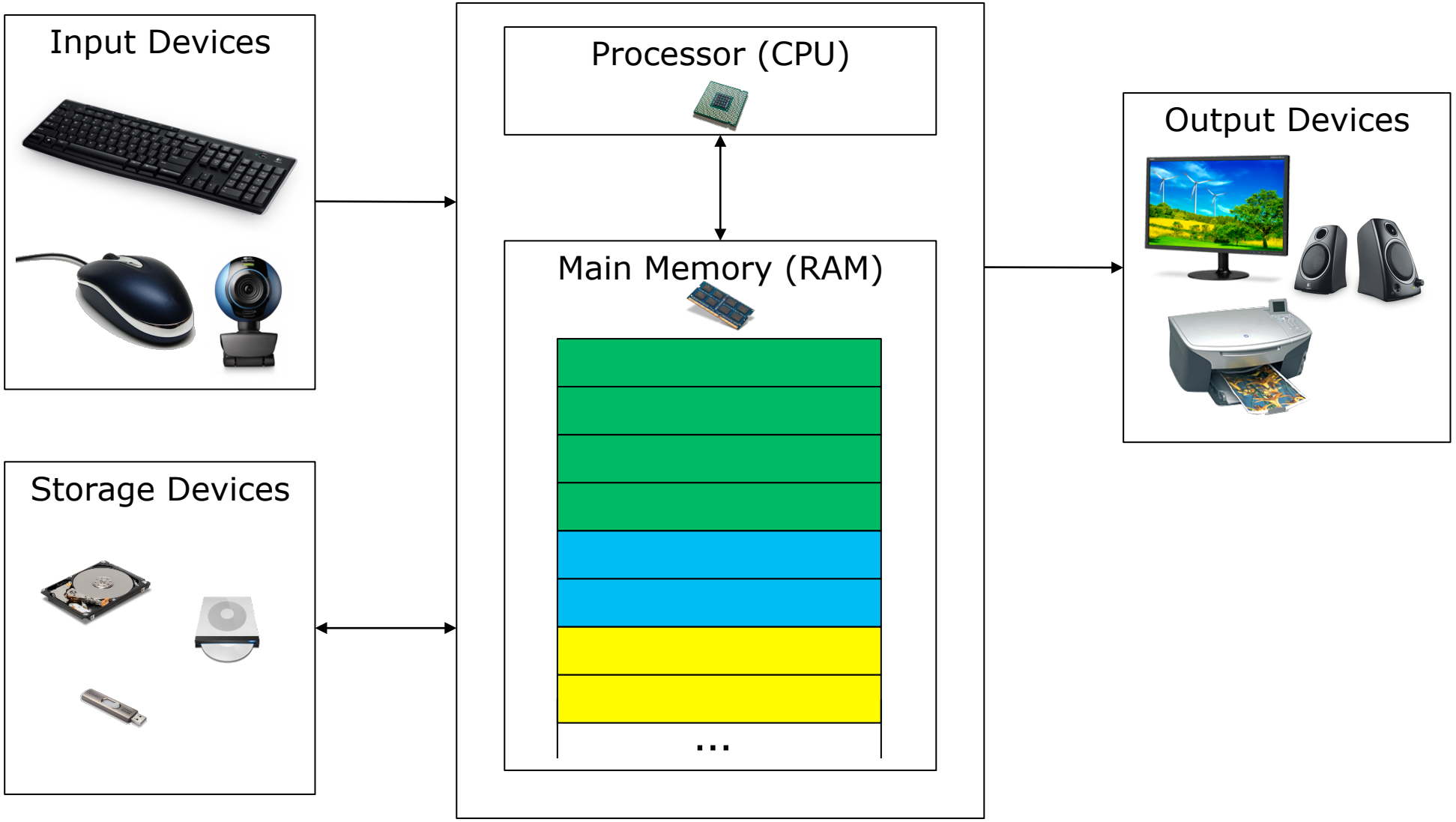


A Bit of History

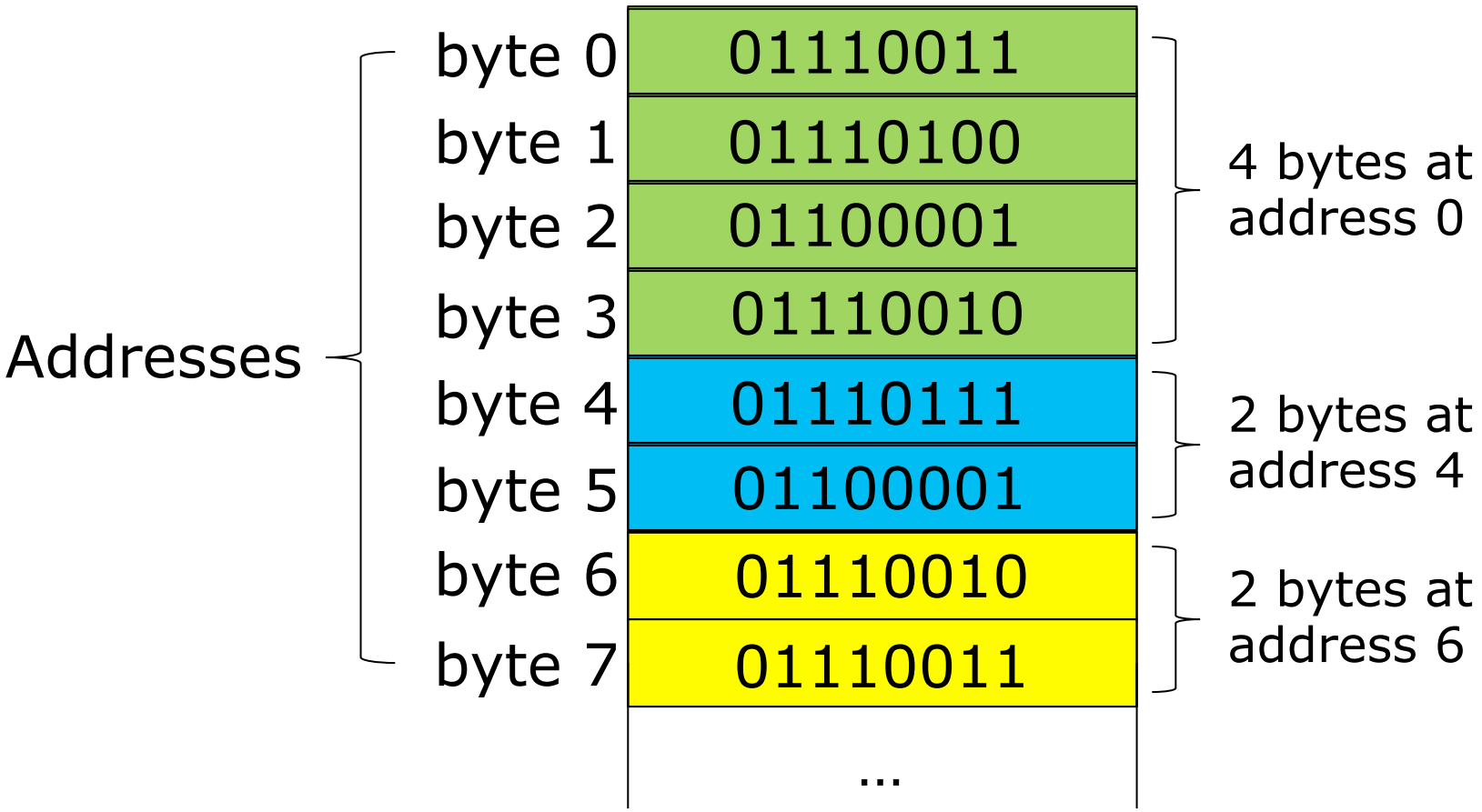
What Makes Up a Computer?

- Hardware
  - Physical components
  - Wide variety of types and manufacturers
  - Abstracted to a simple set of ideas for Computer Science
- Software
  - Programs (i.e., instructions)
  - Wide variety of purposes
  - The focus of this course

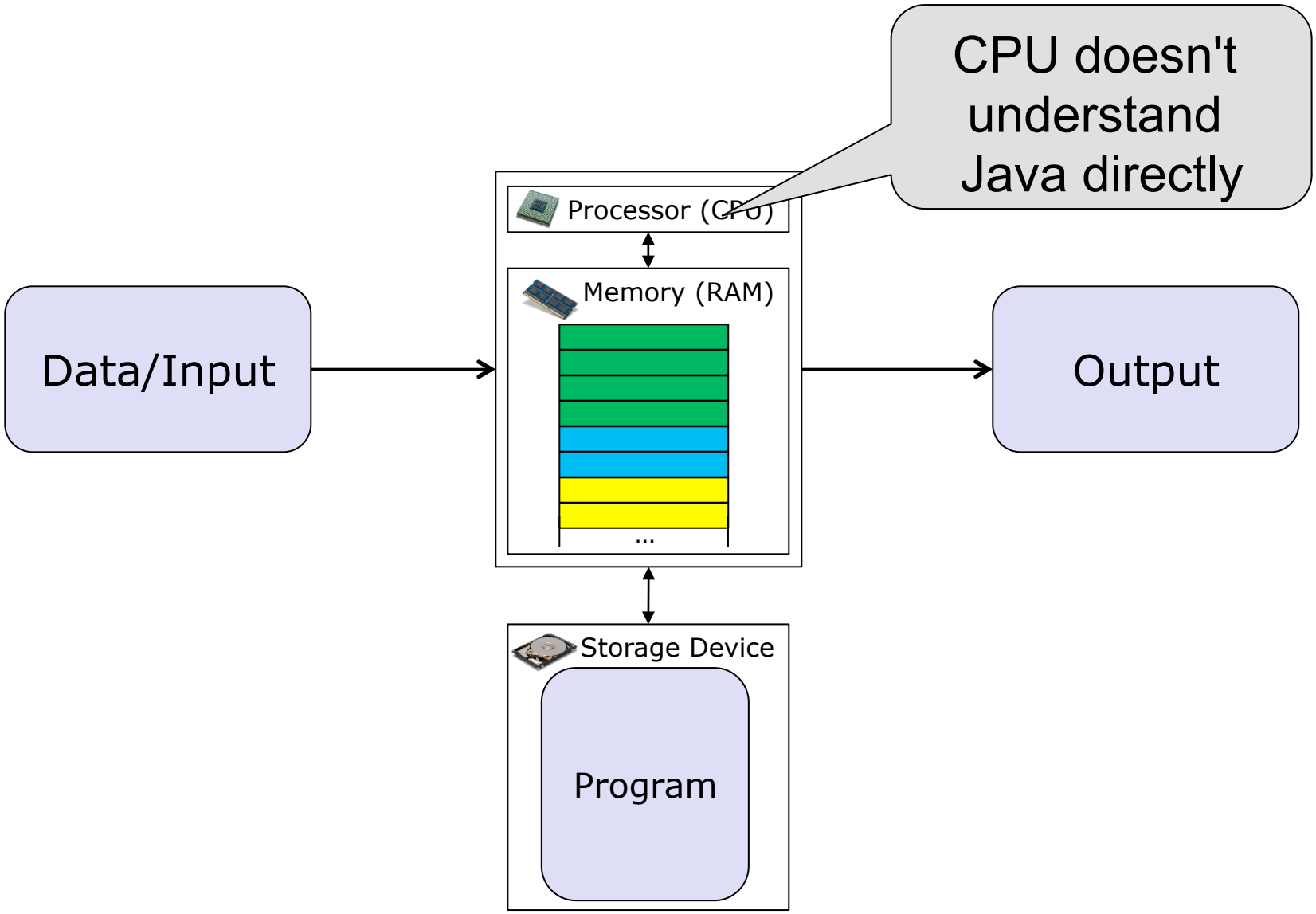
High Level Hardware View



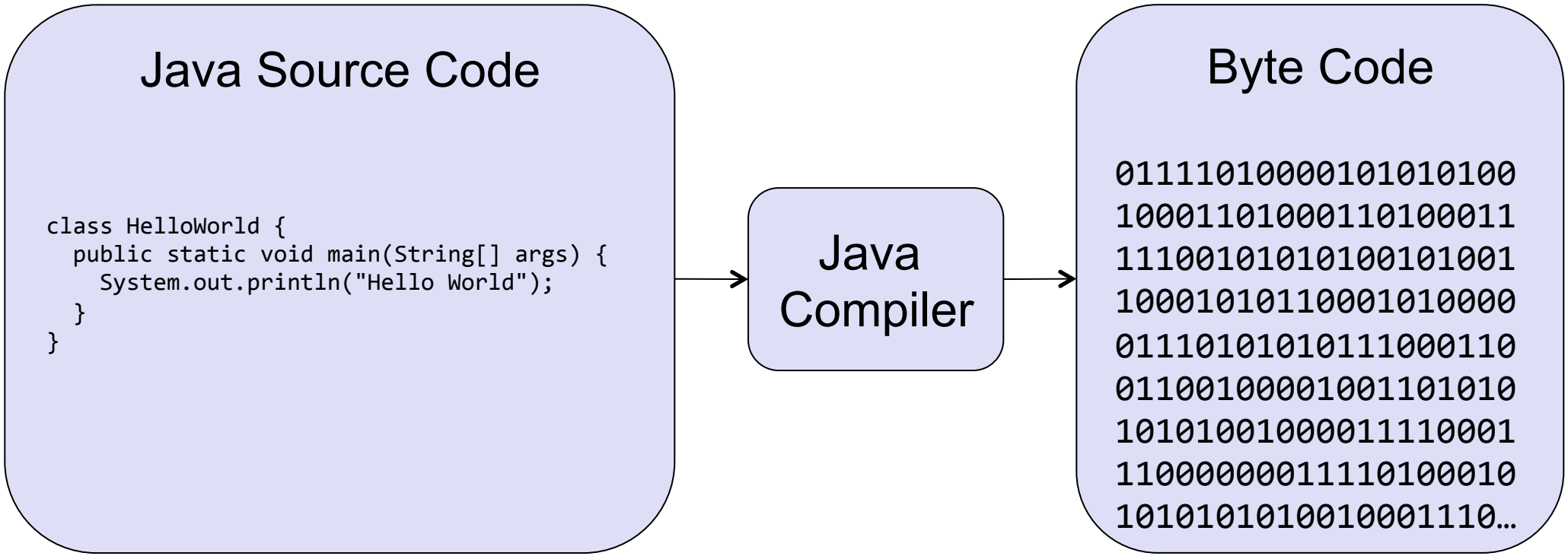
Main Memory (RAM)



Running a Program



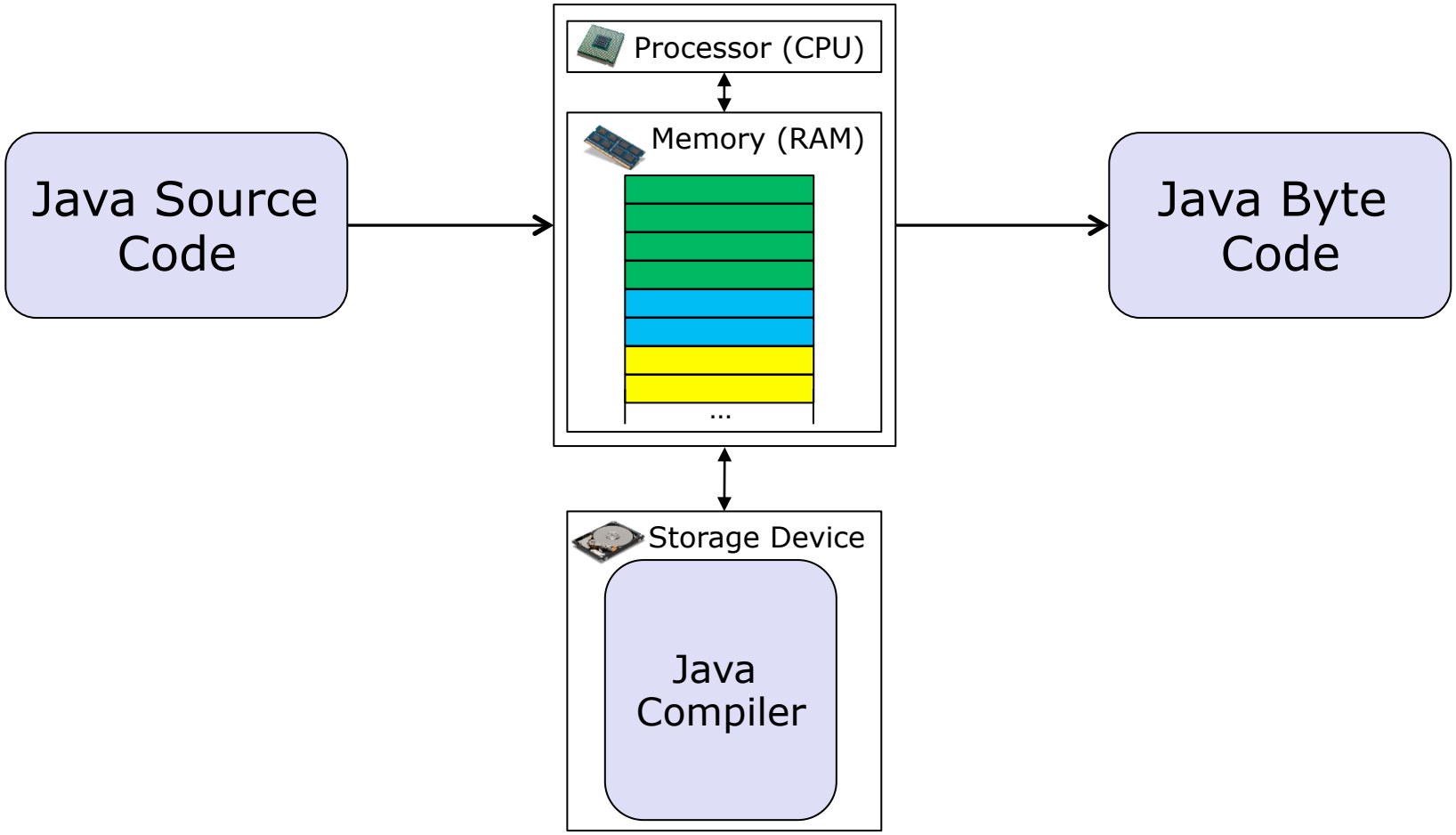
Compilers


Java Source Code
class HelloWorld {
public static void main(String[] args) {
System.out.println("Hello World");
}
}
Java Compiler
Byte Code
01111010000101010100
10001101000110100011
11100101010100101001
10001010110001010000
01110101010111000110
01100100001001101010
10101001000011110001
11000000011110100010
1010101010010001110…

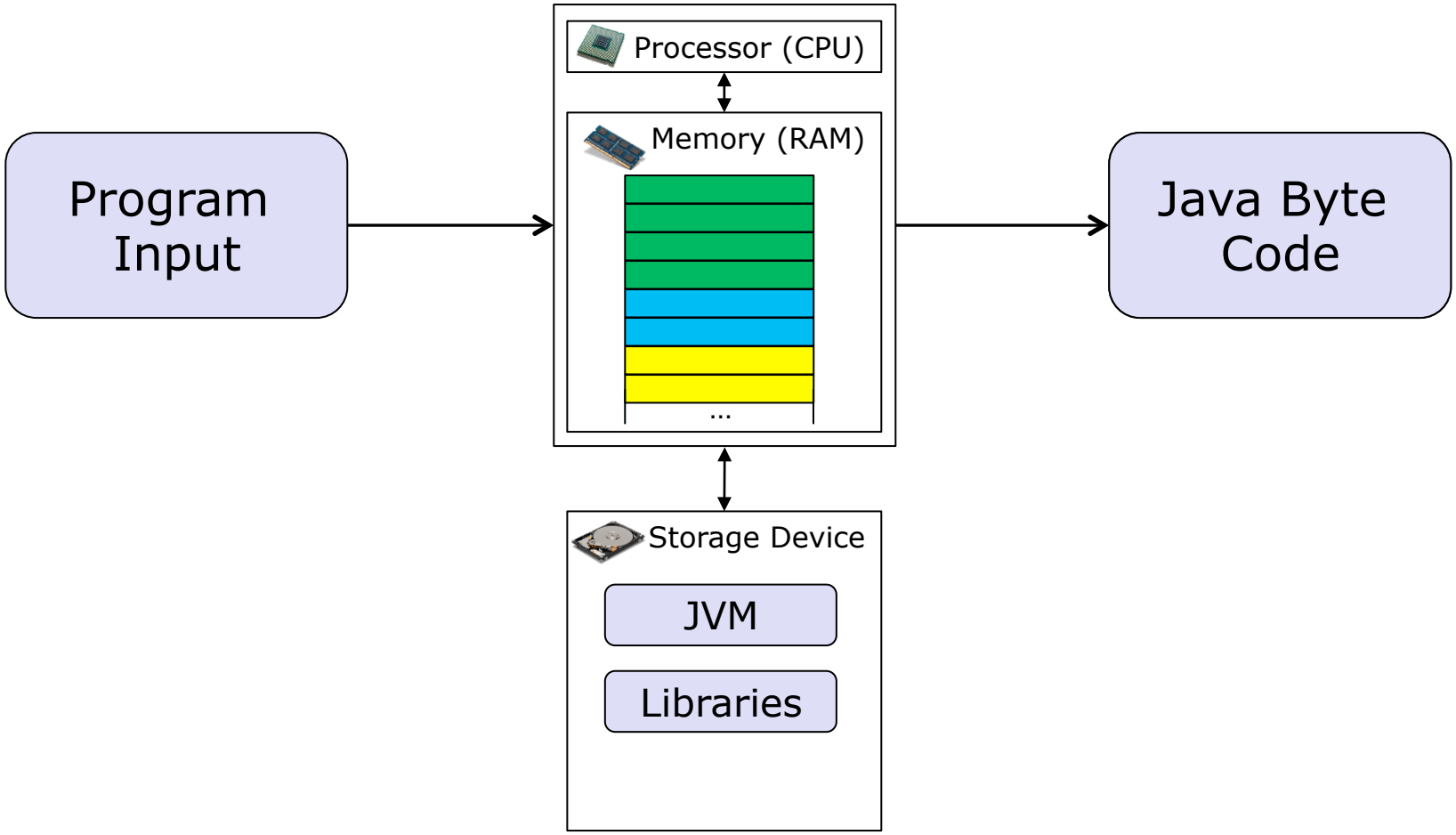
Java Virtual Machine

- Java byte code also can't be executed by a CPU directly
- Instead, the Java Virtual Machine (JVM) is another program that interprets the byte code and translates it into the native CPU language
  - » Allows a program to be compiled once and run on all types of computers (that have a JVM available and installed)
- Other high level languages work differently

Building a Java Program



Running a Java Program



Take Home Points

- Computers have 5 main components: Processor, Main Memory, Input Devices, Output Devices, Storage Devices
- 1 byte = 8 bits (binary digits)
- Main Memory is a sequence of bytes, each with a memory address
- The Java compiler turns source code into byte code
- The JVM uses that byte code along with additional libraries in order to execute your program