

Introduction to Computers and Java

Chapter 1

Preliminaries

- Me: Raheel Ahmad
 - Ph.D., Southern Illinois University
 - M.S., University of Southern Mississippi
 - B.S., Zakir Hussain College, India
- Contact: Science 116, rahmad@manchester.edu, 982-5314
 - Tues: 9:00 - 12:00 am; Thu: 10:00 - 12:00 am
- Email me with subject starting with CPTR105
- <http://users.manchester.edu/Facstaff/RAhmad/classes/105/index.htm>
 - Also, Angel's course webpage has a link to above

Preliminaries

- Course
 - Crucial / Foundational
 - Fun, creativity
- Objectives
 - learn the foundation of programming
 - learn how to write and “think” in Java
- Discuss problems early, often
- Assignments, quizzes, tests
- Keep up to date with the deadlines and due dates

Short URL to course website:

<http://bit.ly/105>

What is programming?

- **Programming:** telling a computer how to solve a problem
- **Program:** set of instructions
- **Programmability:** ability of a computer to accept instructions

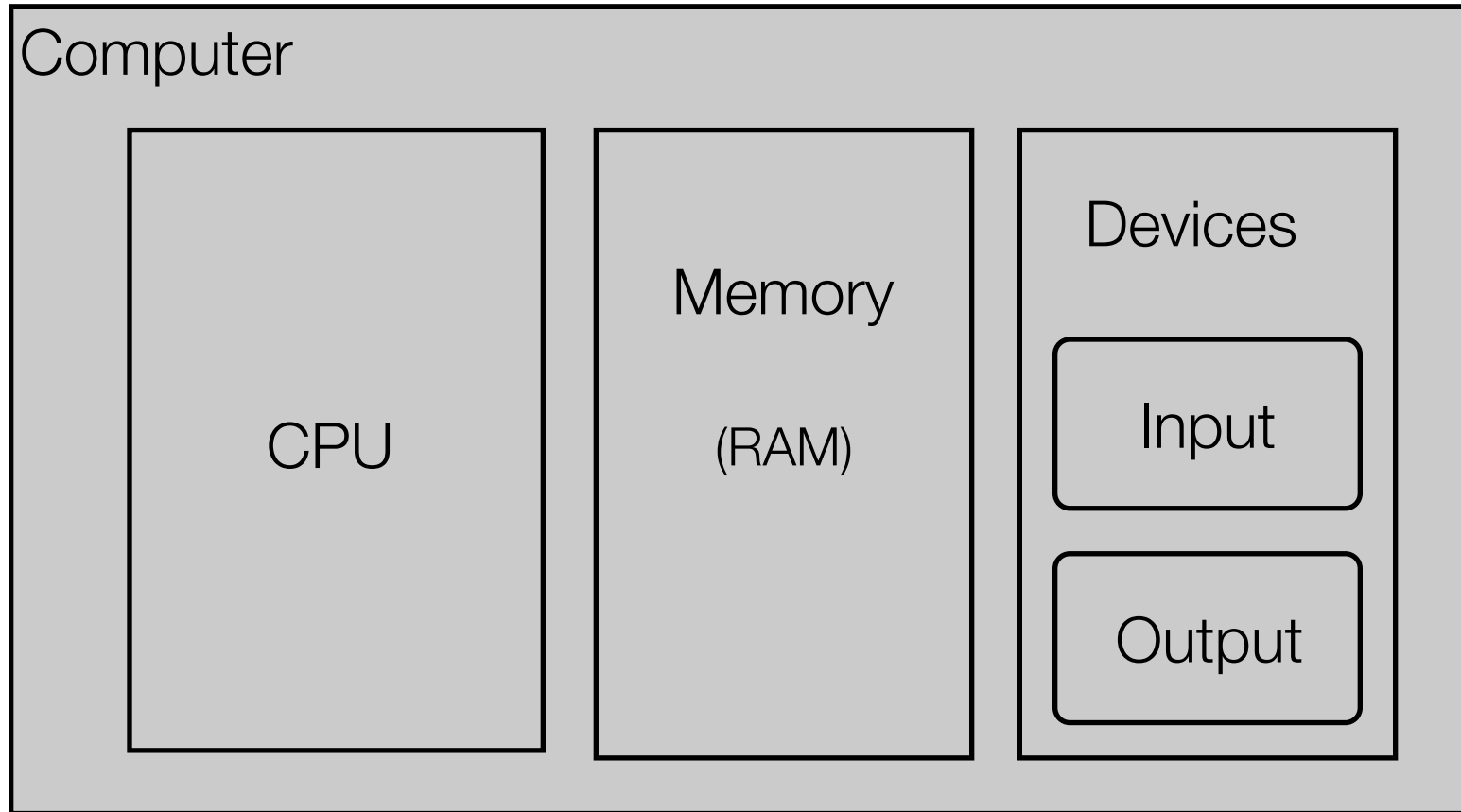
Programming

- Algorithm: also instructions to solve problems
 - but in English (natural language)
 - Example: algorithm for product of 1st 10 numbers:
 1. Start with **$a = 1, b = 1$**
 2. Let **$a = a * b$**
 3. Is **$b = 10?$**
 1. **yes** -> go to 4
 2. **no** -> add 1 to b ; go to 2
 4. **b** is the answer
- *Programming*: translate algorithm to a language the computer can understand
 - usually a *high-level language*
 - *English like syntax*: Java, C++, Python, ...

Hardware and Software

- Computer systems consist of hardware and software.
 - Hardware : the tangible parts of computer systems.
 - Software : programs - sets of instructions for the computer to follow.
- Familiarity with hardware basics helps us understand software.

Computer architecture

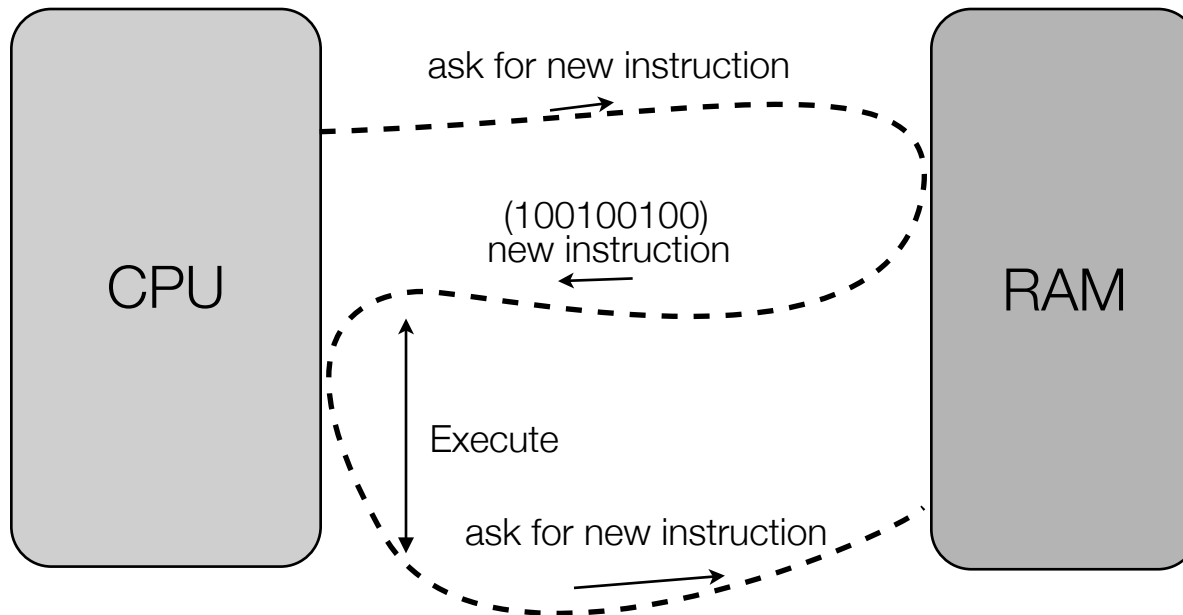


Processor, the brain

- Processor, Central Processing Unit (CPU)
 - executes programs
- Program for CPU: set of instructions
 - in machine language
 - low-level, 1's and 0's
- Executing program is in main memory (RAM)

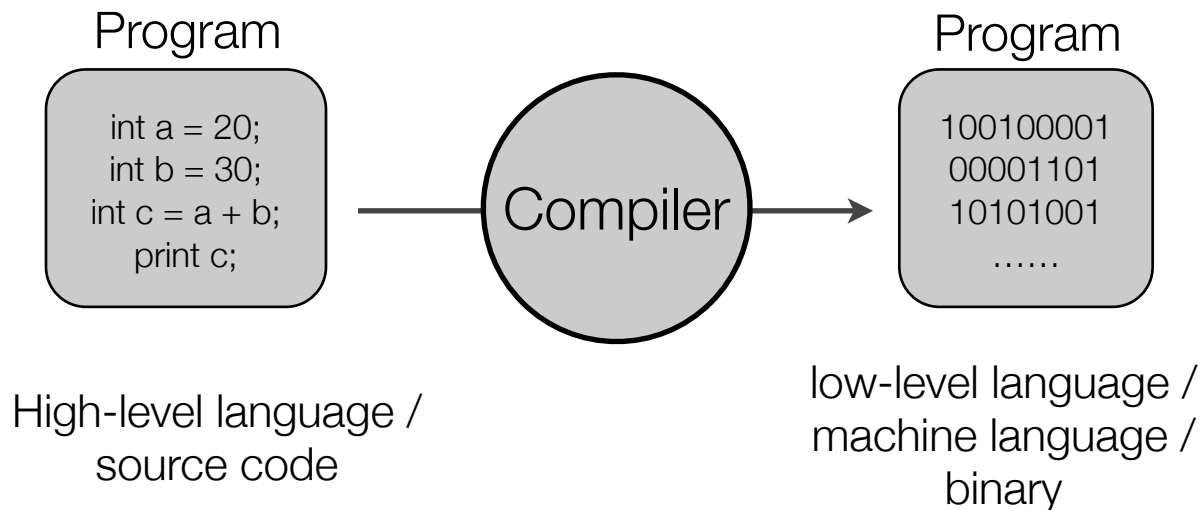
Fetch and execute cycle

- Basic mode of CPU functioning
- Fetch: get a new instruction (or data) from memory
 - in binary (1, 0)
- Execute it
- Fetch new instruction



High-level languages

- Java, C++, etc.
- Cannot run directly on CPU
 - compiler translates from HLL to ML



Example of writing and running a Java program

source code:

```
class Printer {  
    public static void main(String[] args) {  
        System.out.println("Welcome to Java");  
    }  
}
```

save in file:

Printer.java

compile:

javac Printer.java

run:

java Printer

output:

Welcome to Java

Execute your first program

- Go to H:, make a folder “105_programs”
- Code in Notepad, save in previous folder (Printer.java) °
- setx path “%PATH%;C:\Program Files\Java\jdk1.5.0_16\bin”
- Restart command prompt; check javac
- Go to the folder; javac Printer.java; java Printer °

° : steps you always take when programming