COMMUNICATING WITH YOUR COMPUTER
&
PYTHON INSTALLATION

CIS 830 (Spring 2021)

"PROGRAMMING" IS A FORM OF COMMUNICATING WITH YOUR COMPUTER
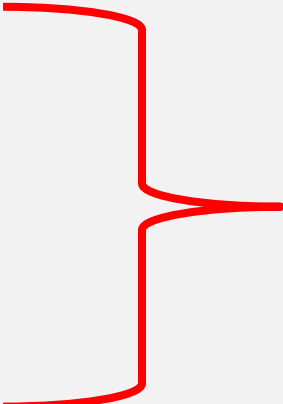
- You are instructing the computer to do tasks

- Programming = **Scripting** = *Coding* (for the purpose of this class)

- **Imperative**
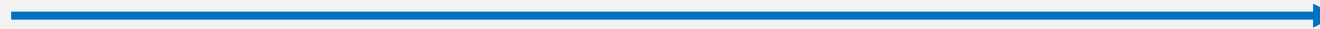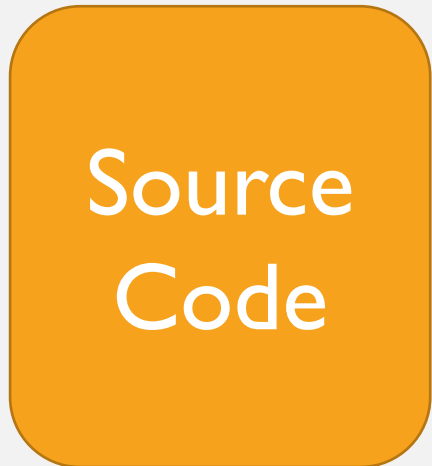 - The computer has no free will

- **Precise**
  - The computer has no context
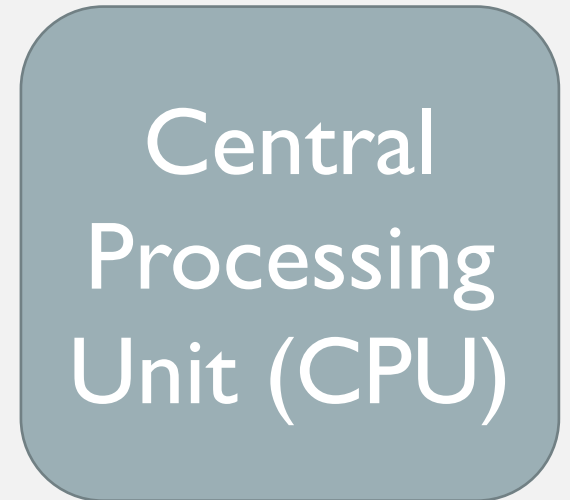
Write code deliberately, and with care

2

A PROGRAMMING LANGUAGE (E.G., PYTHON) IS AN ABSTRACTION OF WHAT THE COMPUTER PROCESSES

What you write

Part of the computer that does the work

Source Code

?

Central Processing Unit (CPU)

SOME LANGUAGES (E.G., C, C++, JAVA) USE A "COMPILER"

What you write

Part of the computer that does the work

Source Code → **Compiler** → **Binary (Machine) Code** → **Central Processing Unit (CPU)**
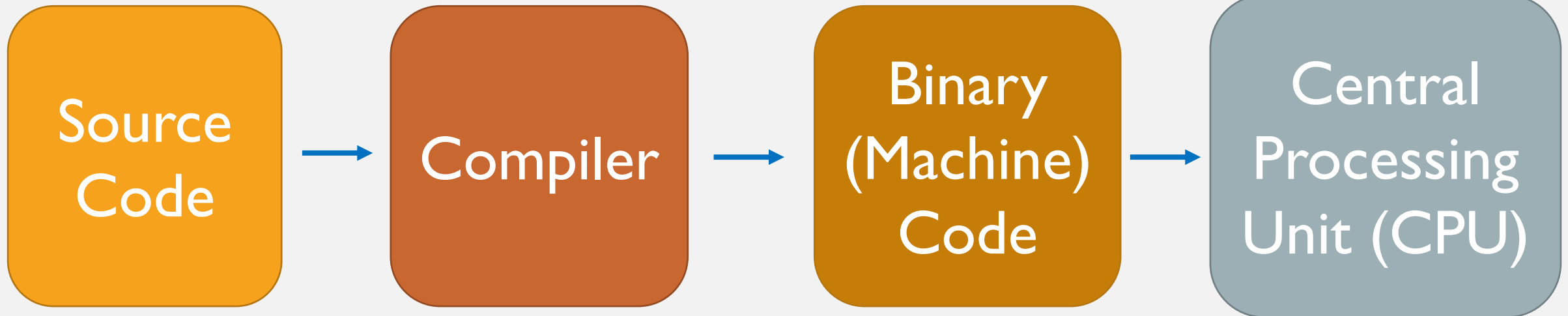
This code is directly *executable* by the CPU

PYTHON USES AN "INTERPRETER"

What you write
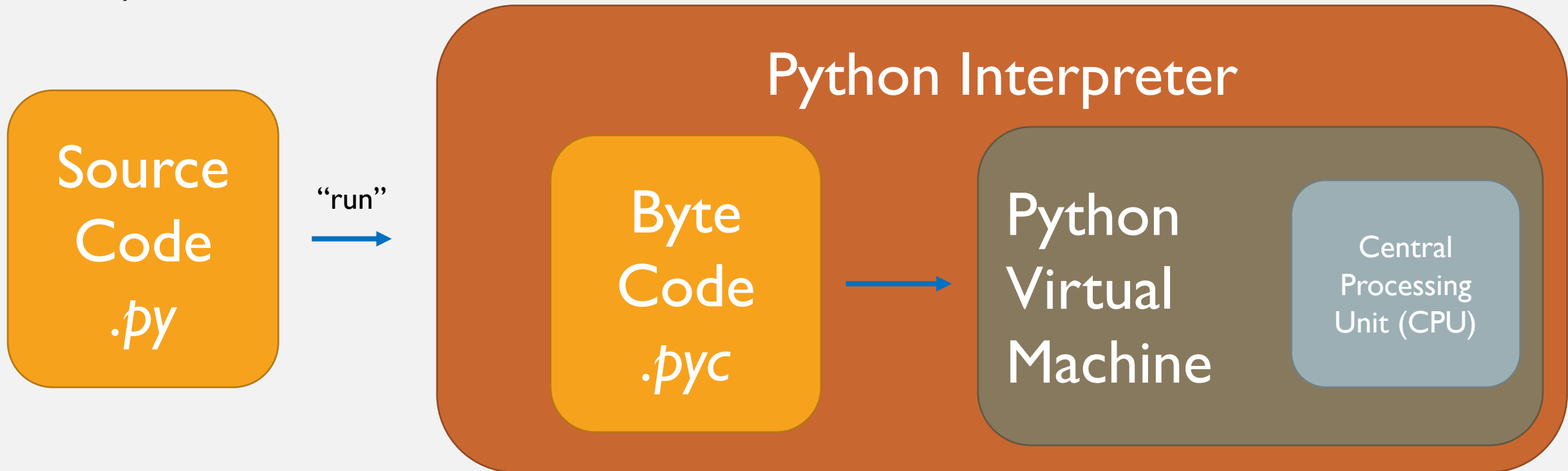
Source Code *.py*

"run" →

Python Interpreter

Byte Code *.pyc* →

Python Virtual Machine

Central Processing Unit (CPU)

COMPILER VS. INTERPRETER

- The interpreter is usually simpler for the user
  - Combines compiling and executing the code into a single step
  - Can be slower as a result (only important in large / complex codes)

- Debugging (finding errors):
  - Interpreter processes code line-by-line ("breaks" when it reaches error)
  - Compiler processes code all at once (breaks if error present anywhere)

Great for learning new languages!

Great for new programmers!

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INSTALLING PYTHON

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HTTPS://WWW.PYTHON.ORG/

- Python is free (no license required)

- Compatible with most operating systems
  - Windows PC
  - Mac (Apple)
  - Linux

PYTHON VERSIONS

- Two main versions: 2.X (latest = 2.7) and 3.X (latest = 3.9)

  - *Same language, different dialects*

  - If installing for the first time → Choose 3.X, which has various improvements over 2.X

    - 2.X is no longer supported by Python

  - BEWARE OF COMPATIBILITY: not all 2.X code will run in 3.X

  - You can install and use both separately (but be careful when doing this)

INSTALLING PYTHON

- Natively installed on Mac OSX and most Linux systems

- Must install on Windows PC

- Can also get Python in a "distribution"
  - Comes with a collection of "libraries" (pre-written Python code for many purposes)
- **Anaconda distribution**
  - Many commonly-used libraries
  - Data science oriented
  - Comes with "integrated development environments"

DOWNLOAD THE PYTHON 3.8 WITH THE ANACONDA DISTRIBUTION

- Visit https://www.anaconda.com/products/individual

- Click "Download" and choose the proper installer (recommend using graphical installer as opposed to command line)

- Follow instructions for installation

  - Do not select "Add Anaconda to PATH" if given the option

Anaconda Installers

Windows ⊞

Python 3.8

64-Bit Graphical Installer (457 MB)

32-Bit Graphical Installer (403 MB)

MacOS

Python 3.8

64-Bit Graphical Installer (435 MB)

64-Bit Command Line Installer (428 MB)

Linux 🐧

Python 3.8

64-Bit (x86) Installer (529 MB)

64-Bit (Power8 and Power9) Installer (279 MB)