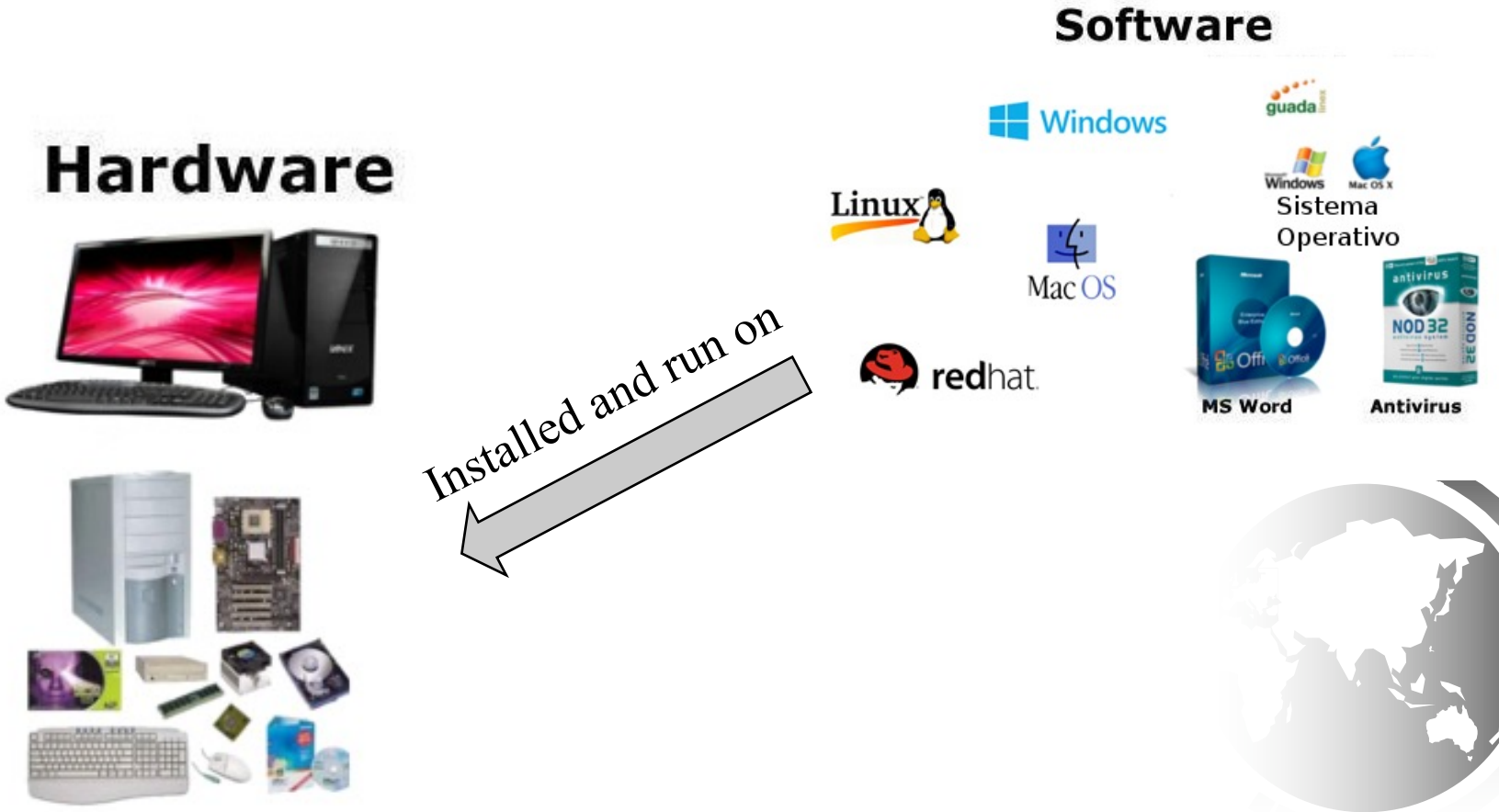
Objectives for Class 1

- 1.1 To explain and describe the concepts of computer hardware, programs, and operating systems (§1.2 -1.4)
- 1.2 To describe the history of Python (§1.5)
- 1.3 To explain the basic syntax of a Python program (§1.6)
- 1.4 To write and run a simple Python program (§1.6)

What is a Computer?

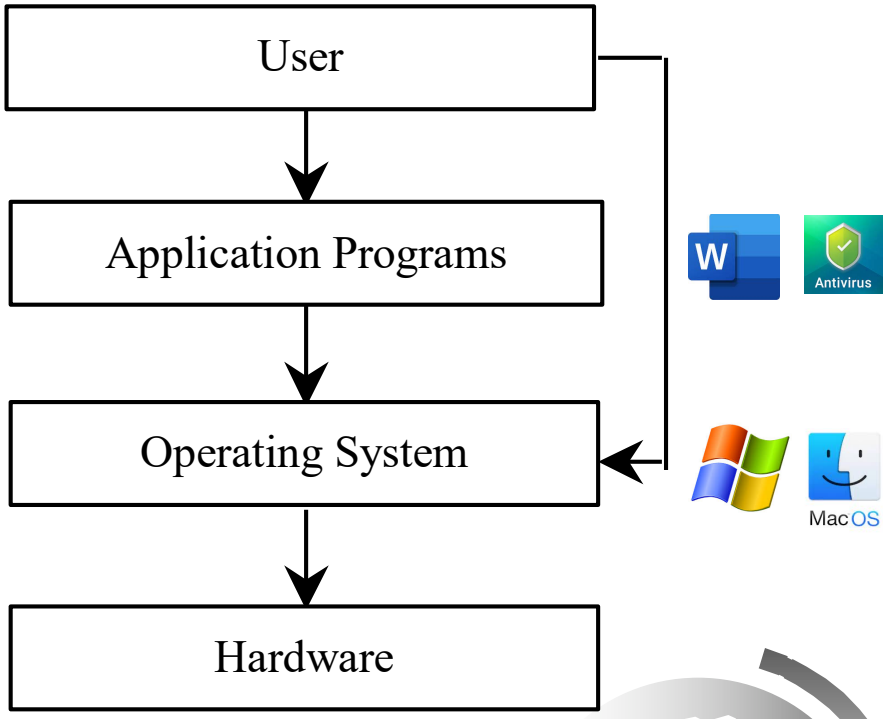


What is Software?

- Instructions to the computer
- Also known as computer programs
- Programs written using programming languages

Operating Systems

- A program
- **Manages and controls** a computer's activities.
- Must be installed on a computer
- Application programs cannot run without an operating system.



Exercise 1.1
(objective 1.1)

Types of Programming Languages

- Machine Language
  - Set of primitive instructions
  - Binary code
  - Program called machine code
- High-level Language
  - English-like
  - Program called source code

Add two numbers

```
1101101010011010
```

```
14+56
```

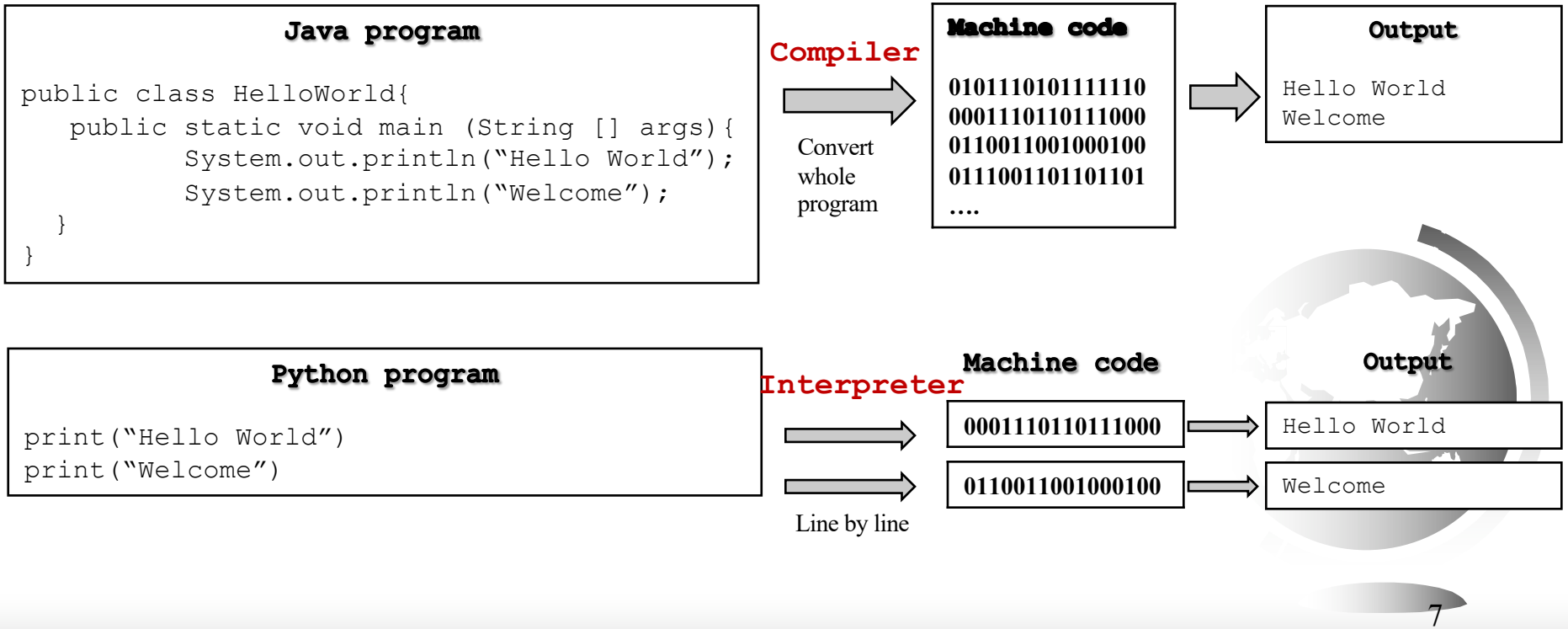
My Journey with High-Level Programming Languages

- Pascal - My first program at high school
- C – My first programming language at university
- C++ - Control robots as an undergraduate
- C# - Build my first website as an undergraduate

- Java – Various applications
- Python – AI, process data

Translating Source Code to Machine code

- Translator called as Interpreter (Python) or compiler (Java)
- Translator itself a program

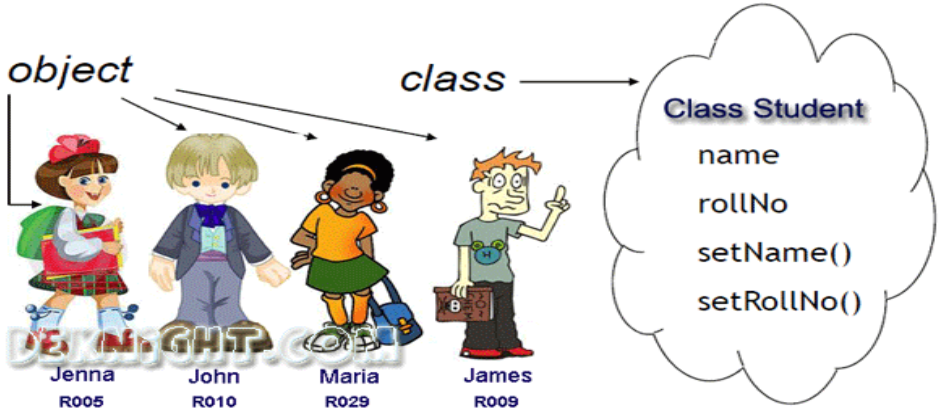


Python for General Purpose

- Write for **any** programming tasks.
  - Google - search engine,
  - NASA – mission critical project
  - New York Stock Exchange – processing financial transactions
  - Others?

Python is Object-Oriented

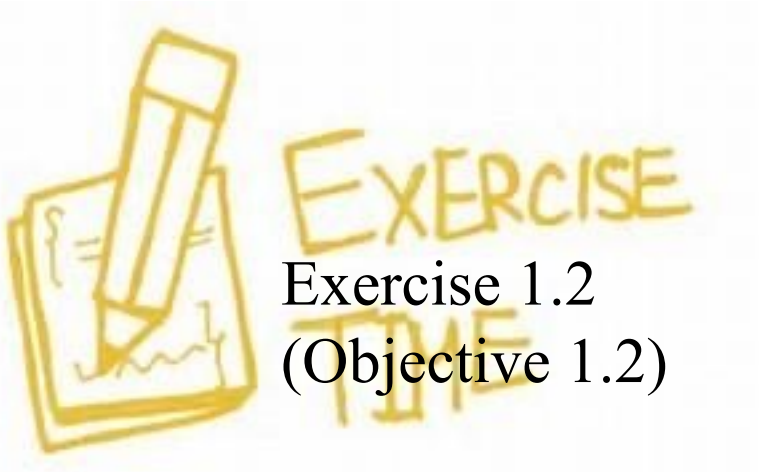
- An object-oriented programming(OOP) language
- A powerful tool for developing reusable software.



Advantage: With OOP, we do not need to write a program for each student.

The History of Python

- Created by Guido van Rossum in Netherlands in 1990
- Open source
- Python 2 vs. Python 3



Exercise 1.2
(Objective 1.2)

Step 1: Google Python → download → Python 3.9.1 → install → using IDLE (Python GUI)

https://www.python.org/

When you start Python, you will see something like:

```
Python 3.9.1 (v3.9.1:e09359112e, Jul  8 2019, 14:54:52)
[Clang 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.
>>>
```

Note: The ">>>" is a Python prompt indicating that Python is ready for us to give it a command. These commands are called statements.

Step 2: Run the commands in red below one by one. Remember to press Enter key at the end of each command.

```
>>> print("Hello, world")
Hello, world
>>> print(2+3)
5
>>> print("2+3=", 2+3)
2+3= 5
>>>
```

Interactive mode

Step 3: File -> New File;
Step 4: Type the three lines below in the text editor;
Step 5: File -> Save as “test”
Step 6: Run -> run module
Please check what will be printed.

```
print("Hello, world“)
print(2+3)
print("2+3=", 2+3)
```

Script mode

Step 7: Create a new Python program "`ComputeExp`" and enter the commands below.

Please check what will be printed.

```
# Display three messages
print("Welcome to Python")
print("Python is fun")
print("Problem Driven") # Display Problem Driven
```

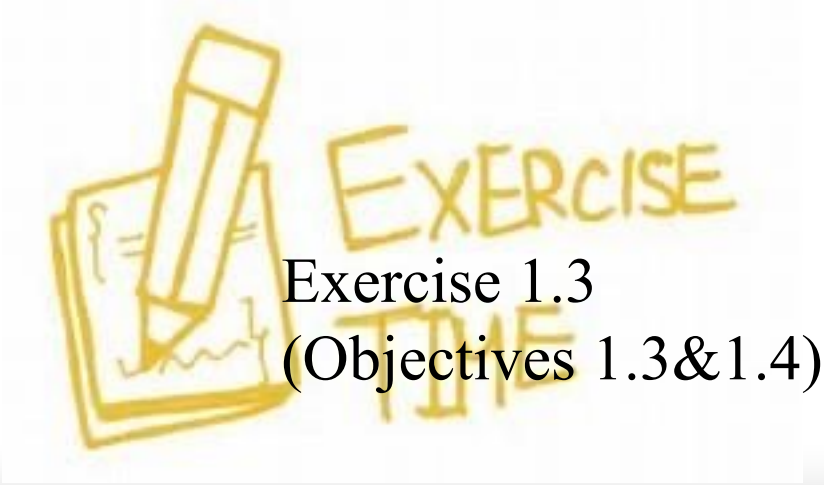
Script mode

Step 8: Create a new Python program "`Welcome`" and enter the commands below.

Please check what will be printed.

Script mode

```
# Compute expression
print("(10.5 + 2 * 3) / (45 - 3.5) = ")
print((10.5 + 2 * 3) / (45 - 3.5)) # Display the result of the expression
```



Exercise 1.3
(Objectives 1.3&1.4)