



# INTRODUCTION TO PROGRAMMING LANGUAGES

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# WHAT IS A PROGRAMMING LANGUAGE

1. What is a natural language?

Human  Human

2. What is a programming language?

Human  Computers



# WHAT IS A PROGRAMMING LANGUAGE

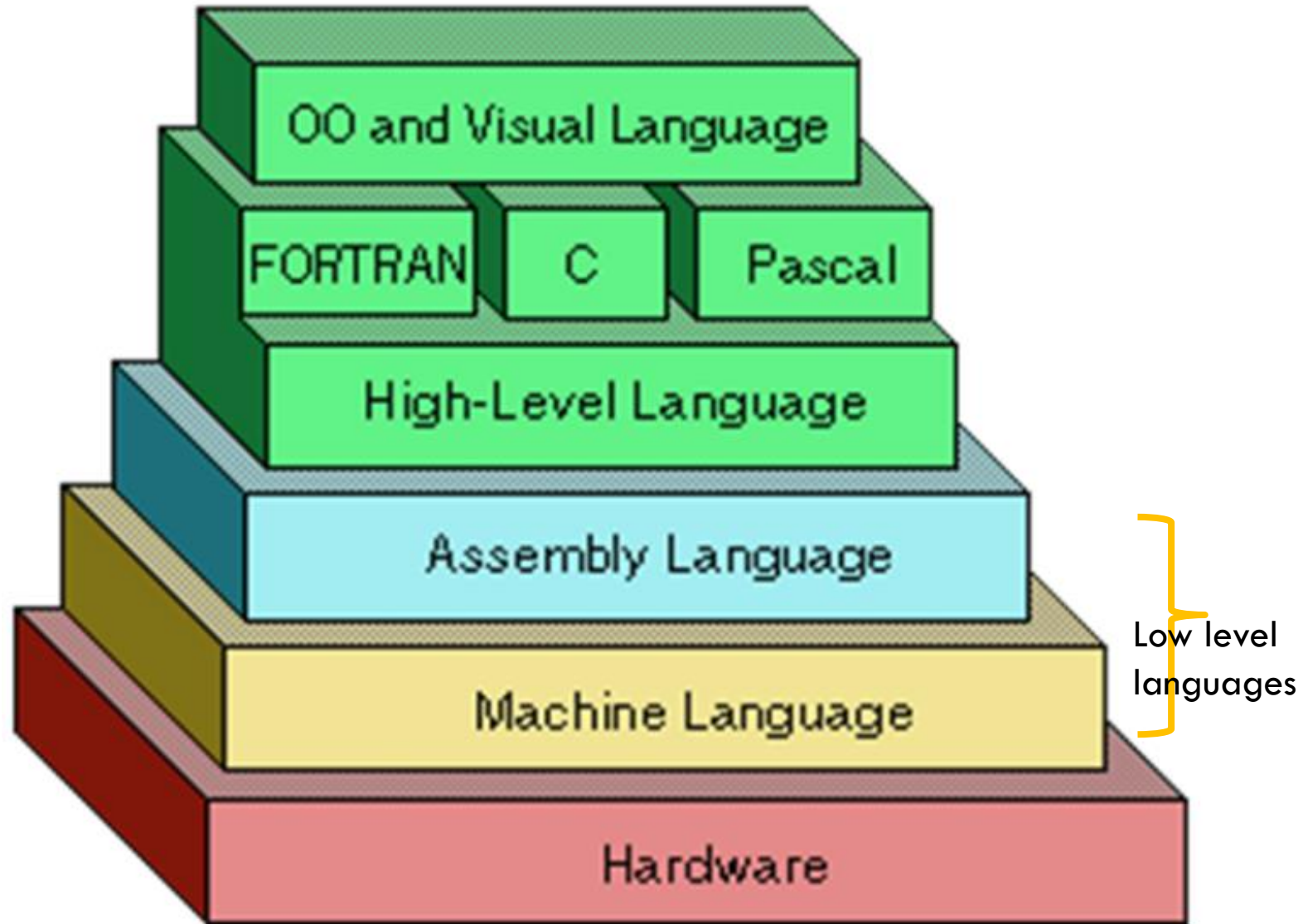
A programming language is a notation for describing computation in computer-readable and human-readable form.

# LEVELS OF PROGRAMMING LANGUAGES

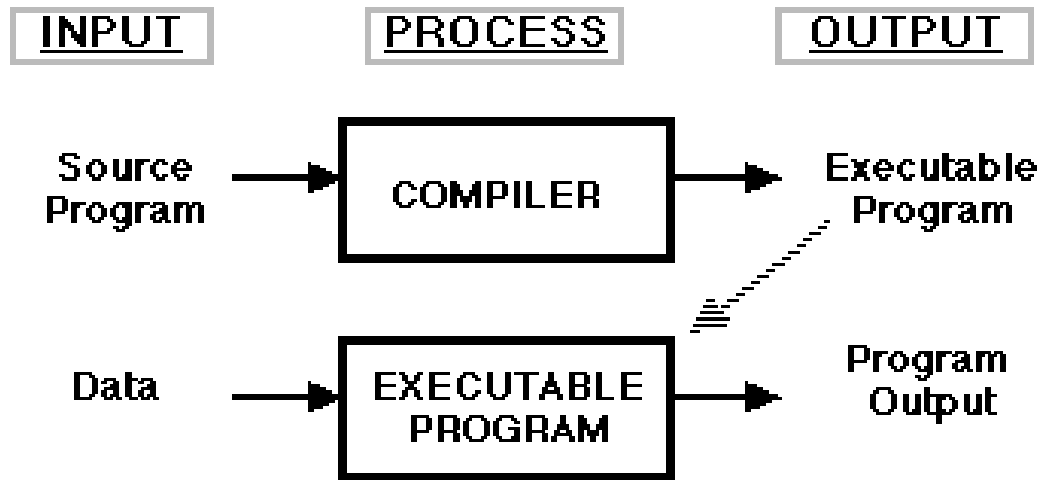
High-Level Language

Assembly Language (optional)

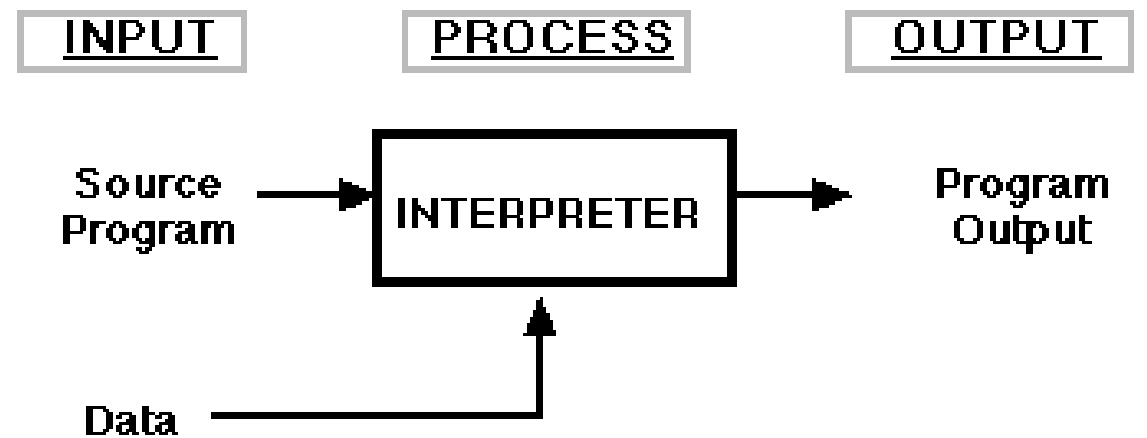
Machine Language



# COMPILERS



# INTERPRETERS



# WHAT IS A OBJECT-ORIENTED PROGRAMMING (OOP) LANGUAGE

Everything is based on “object”.

Attributes

Methods



python™

# INTRODUCTION TO PYTHON

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# WHAT IS PYTHON

Object-oriented programming language (OOP)

Interpreted

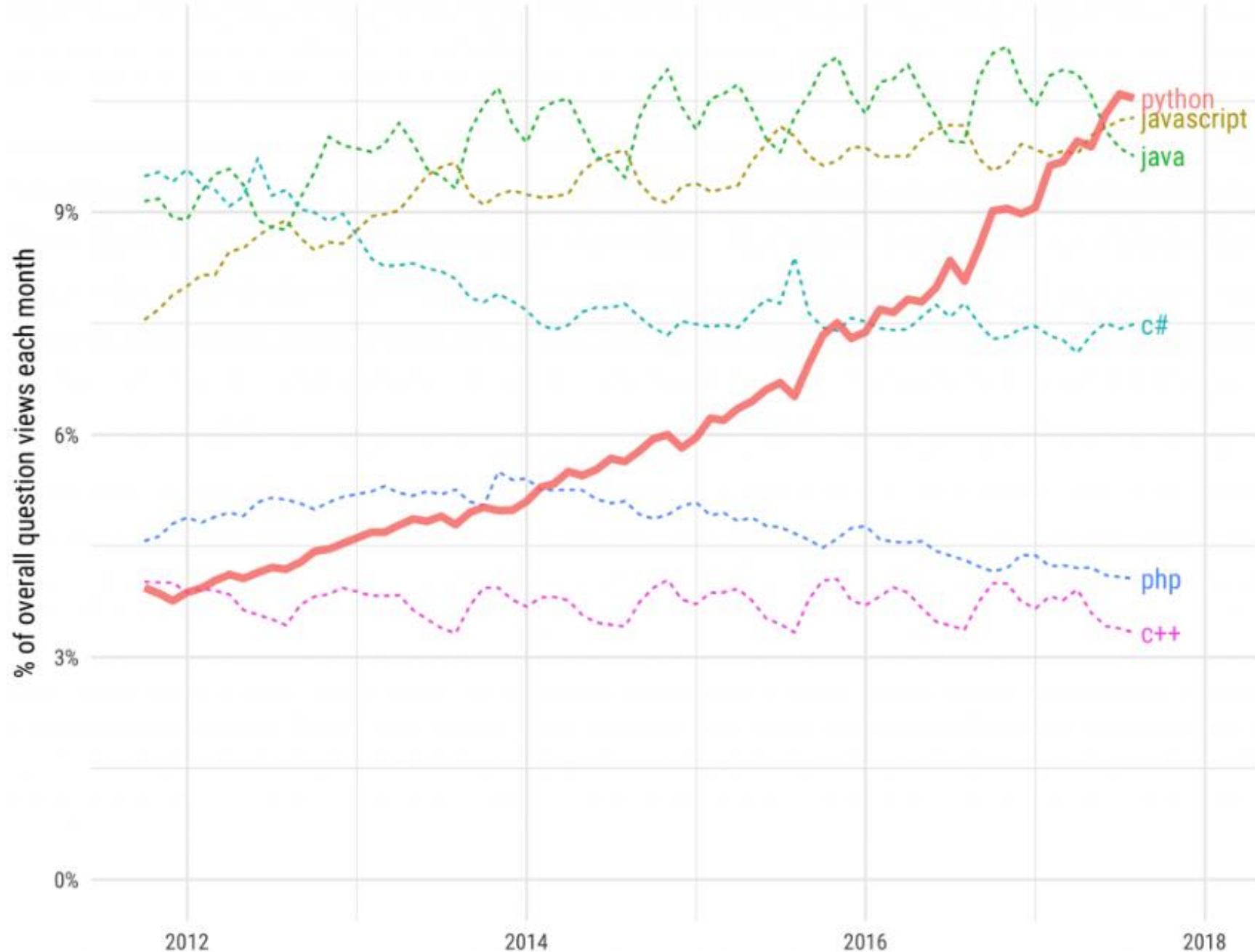
High level

...



# Growth of major programming languages

Based on Stack Overflow question views in World Bank high-income countries



# WHAT IS A PYTHON VARIABLE

A variable is created when you first assign a value to it

```
x = 5
```

# VARIABLE TYPES

**Numbers:** int, float, complex

**Strings:** `Hello world` / "Hello world"

**Lists:** [1, 2, 'hello', 'world']

**Tuples:** (1, 2, 'hello', 'world') (read-only)

**Dictionary:**

```
dict = {}
```

```
dict['one'] = 'hello'
```

```
dict['two'] = 'world' (key-value pairs)
```

# CASTING

```
x = int(1)    # x will be 1  
y = int(2.8) # y will be 2  
z = int("3") # z will be 3
```

# OPERATORS

+ Addition

- Subtraction

\* Multiplication

/ Division

% Modulus  $5\%2 = 1$

\*\* Exponentiation  $5**2 = 25$

// Floor division  $5//2 = 2$

# COMPARISON OPERATORS

== Equal

!= Not Equal

> Greater than

< Less than

>= Greater than or equal to

<= Less than or equal to

# LOGICAL OPERATORS

and:  $3 > 5$  and  $2 > 1$

or:  $3 > 5$  or  $2 > 1$

Not: not  $3 > 5$

(true or false?)

# IF STATEMENTS

```
a = 1  
b = 2  
if b > a: print("b is greater than a")
```

```
if b > a:  
    print("b is greater than a")  
elif a == b:  
    print("a and b are equal")  
  
else:  
    print("a is greater than b")
```





# INSTALL PYTHON

`“python --version”`

Windows users need to install Python manually.