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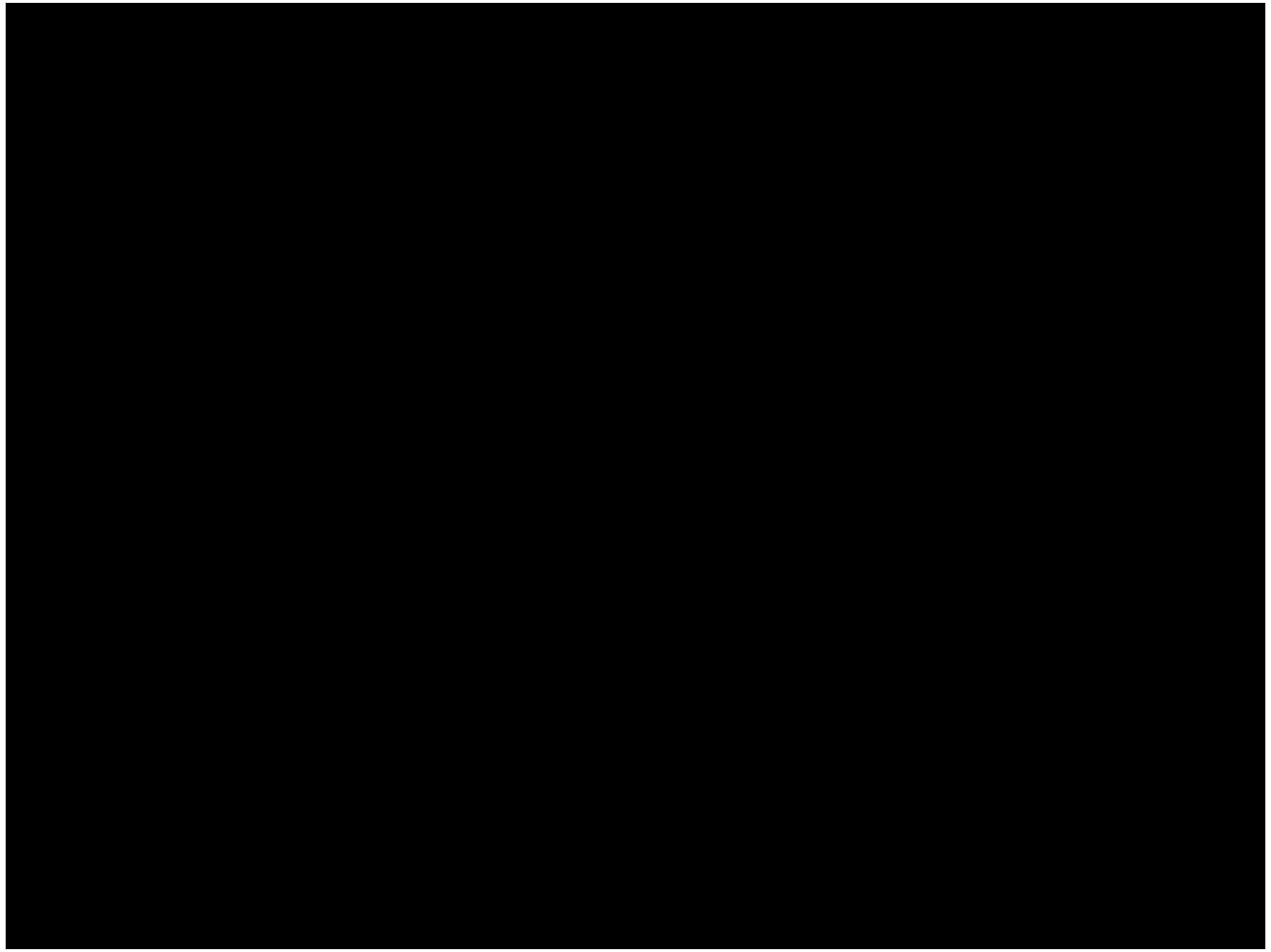
Introduction to Programming with Python

II.1. Introduction

Oscar Delgado
oscar.delgado@uam.es

How to talk to a computer?



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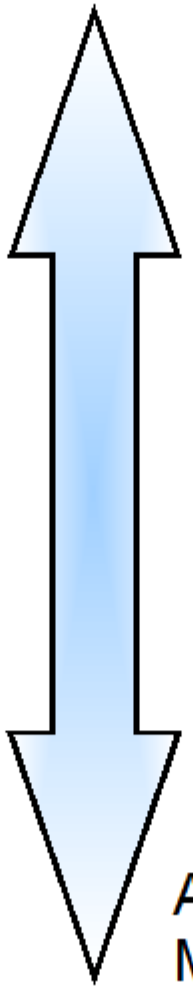
High vs low level languages

- High-level
  - Close to problem
  - System independent



SQL Python
Java, C#
FORTRAN, COBOL, C++

C/C++

- Low-level
  - Close to system
  - Doesn't reflect problem

Assembler
Machine

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Hello world!

Assembly

```
section     .text
global      _start

_start:

    mov     edx,len
    mov     ecx,msg
    mov     ebx,1
    mov     eax,4
    int     0x80

    mov     eax,1
    int     0x80

section     .data

msg     db  'Hello, world!',0xa
len     equ $ - msg
```

C

```
#include<stdio.h>

main()
{
    printf("Hello World");


}
```

Python

```
print("Hello world!")
```

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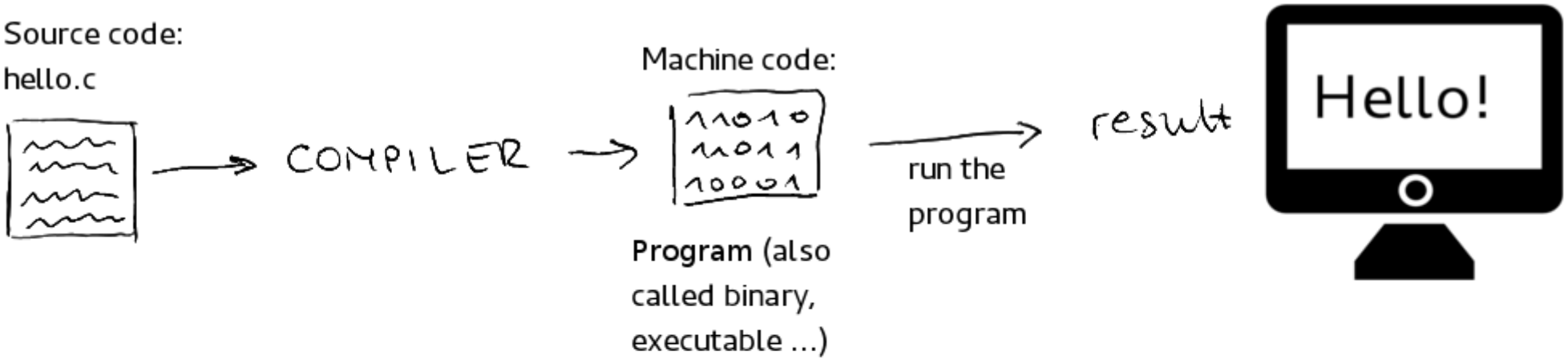
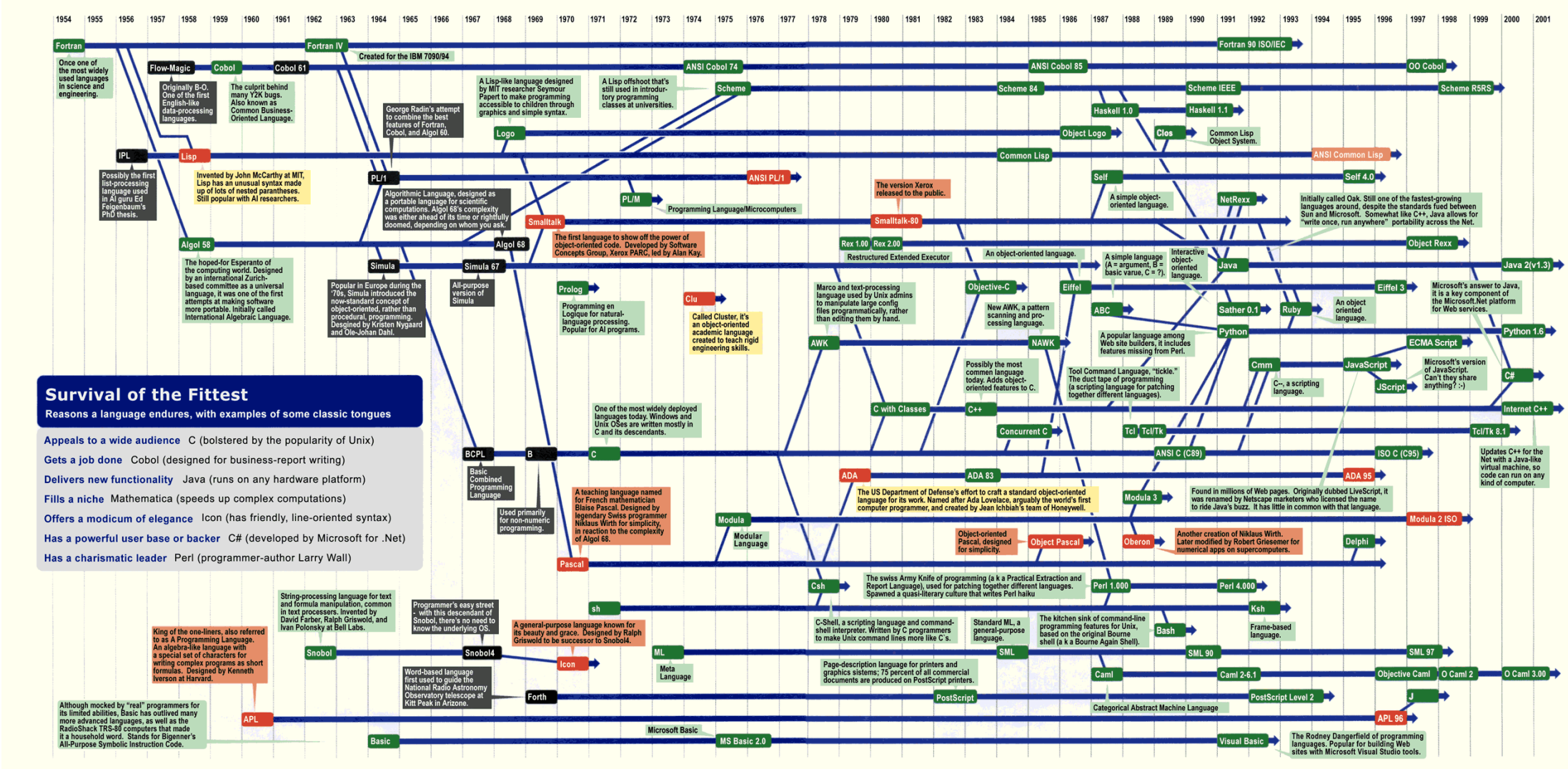
Compiled vs Interpreted



Why Python?



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Why Python?

Interpreted, high-level

Modern, easy-to-learn, powerful

Object oriented

"Quite" fast

EXTENSIVE library support

Printing

```
print('Hi there')
print('The value of 3+4 is', 3+4)
print('A', 1, 'XYZ', 2)
```

```
Hi there
The value of 3+4 is 7
A 1 XYZ 2
```

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Printing

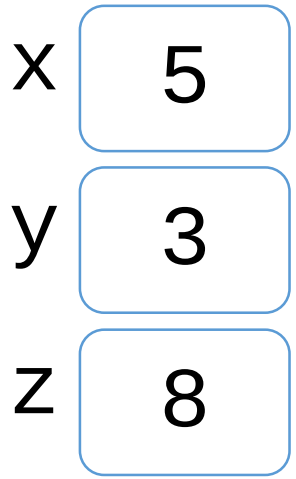
Python will insert a space between each of the arguments of the print function

The print function will automatically advance to the next line

Variables

Variables are “boxes” with a name for storing values

```
x = 5
y = 3
z = x+y
```



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Variables

Which are the final values for **x**, **y** and **z**?

```
x=3
y=4
z=x+y
z=z+1
x=y
y=5
```

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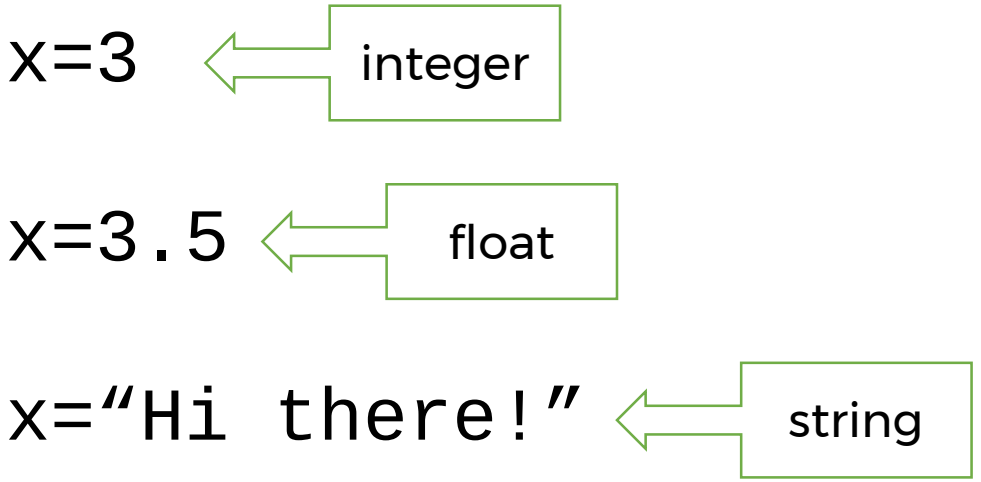
Variables data types

	C	Python
Declaration	int age;	-
Initialization	age=35;	age=35
Data type	Explicit (int)	Implicit

Dynamic variables datatype

- Variables datatype is dynamic: it “adapts” to the type of the content it holds



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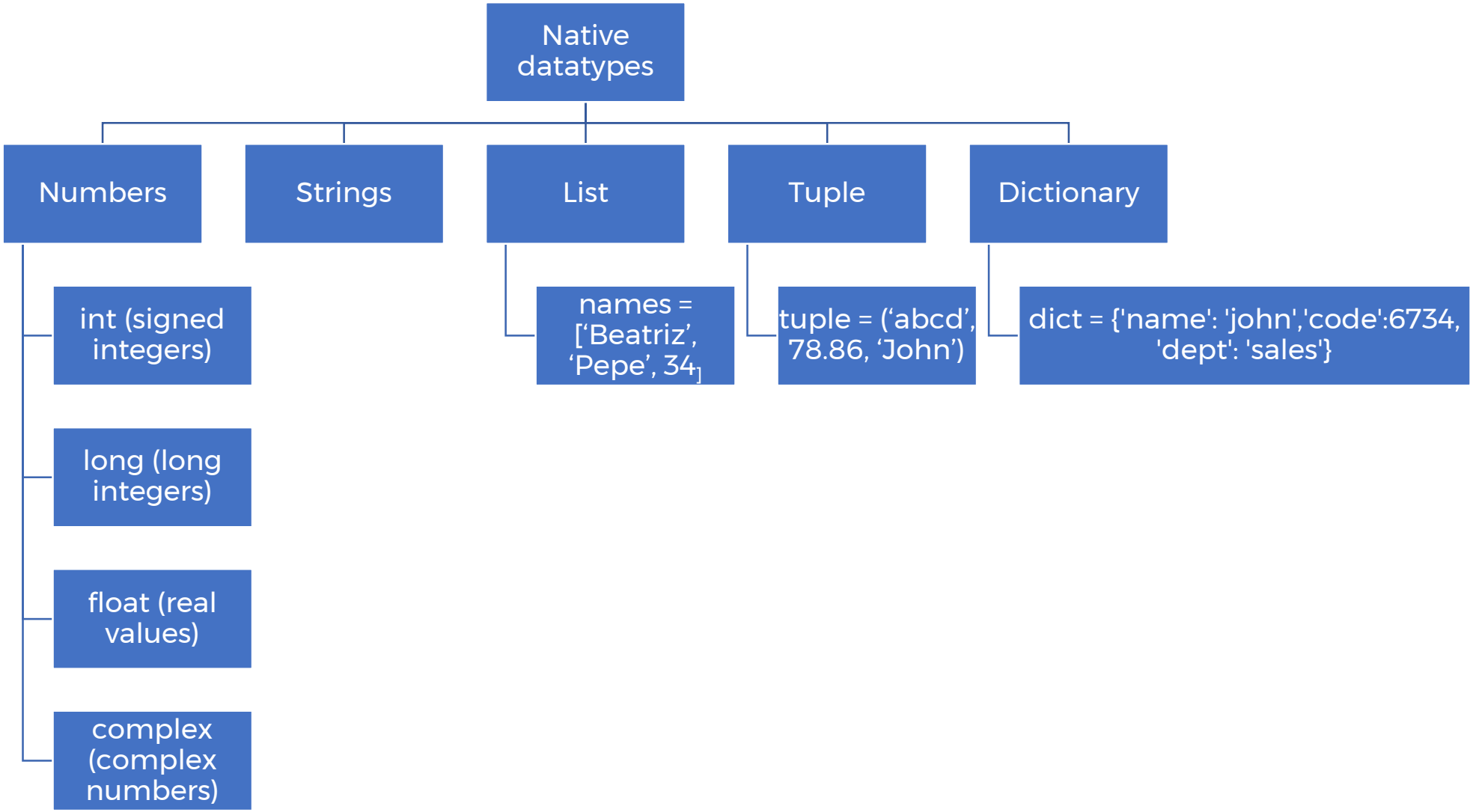

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Variable names

- Can contain letters, numbers, and the underscore.
- *Cannot* contain spaces.
- *Cannot* start with a number.
- Case matters—for instance, temp and Temp are different.

Getting input

The input function is a simple way to get information from people using your program.

```
name = input('Enter your name: ')
print('Hello, ', name)
```

Getting input

To get numbers from the user, we need the eval function:

```
n = input('Enter a number: ')
num = eval(n)
print('Your number squared:', num*num)
```

n is a varible of type string
num is a variable of type integer

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Comments

A comment is a message in the code of the program, often used to describe what a section of code does or how it works, especially with tricky sections of code.

Single-line comments For a single-line comment, use the # character.

```
# a slightly sneaky way to get two values at once
num1, num2 = eval(input('Enter two numbers separated by commas: '))
```

Multi-line comments For comments that span several lines, you can use triple quotes.

```
""" Program name: Hello world
    Author: Brian Heinold
  Date: 1/9/11
"""
print('Hello world')
```

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