

■ "Programming Languages"

- Synthetic Language intended to write computer instructions.
- A separate programs (compiler / Interpreter) translates the language to binary instructions.

'59 IBM FORTRAN
 by John Backus.

■ Python
 '98 Guido Van Rossum.

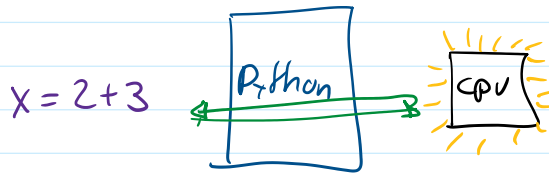


'98 Guido Van Rossum.

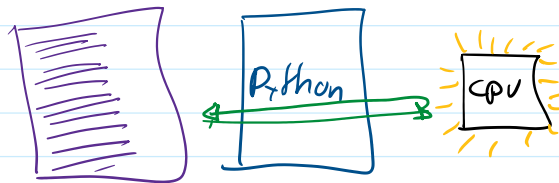
'2008 Python-3



Interactive Mode



Batch Mode.



• Most Basic Python:

- Literal: constant values part of the language.
 - Numbers
 - Strings.

- Expressions:

Sentences made of operands and operators that are part of the language.

+ - * / ()
// % ← remainder

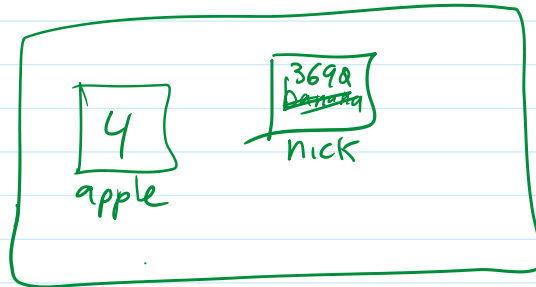
- Assignment.

assign a value to a (named) piece of memory

Syntax: `name = expression`

Syntax: `name = expression`

variable.



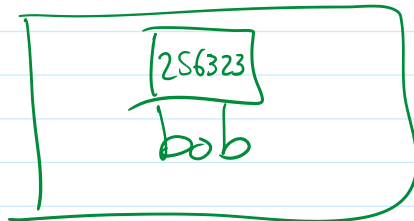
- basic input/output.

`print(expression)`

displays expression into screen.

`name = input()`

read from keyboard and store in name.



- Conditionals (Chap-4)

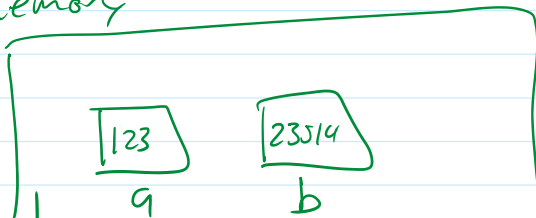
Programs can make decisions.

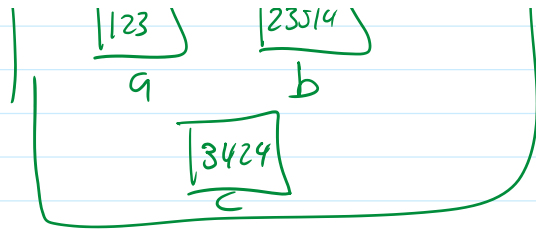
- Repetition (Chap-5)

Programs can repeat a block of instructions a fixed number of times or until some condition is true/false.

→ Demo: batch/file mode.

Memory





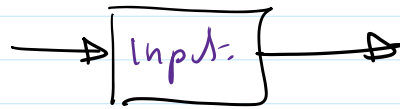
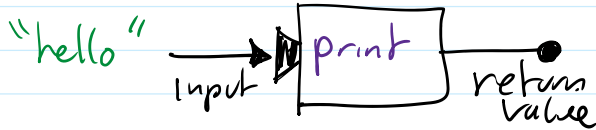
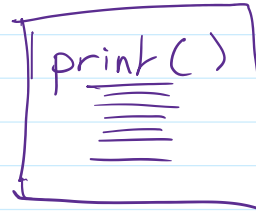
• A Little about "functions"

print()
input()

A "named piece of code"

A "black box"

print('hello')



• function int(x)

takes a value x and returns an integer representation of x, if possible.

• Assignment is not Algebra.

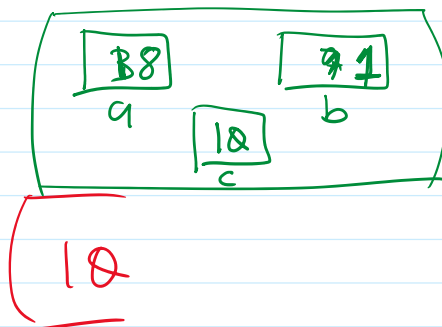
= is not the "equals" from Math.



```

1 a = 3
2 b = 7
3 c = a + b
4 a = 8
  print(c)
  b = 1

```



- Rules for names.

- a b c apple
- Names can consist of letters, numbers and '_' underscore
 - Names cannot begin with a number.
 - Names are case sensitive.

Apple apple ~~2p~~ p23

orange

a_p_27

- There is a list of reserved names.

- More Arithmetic operators.

a ** b exponentiation.

+ = apply operation and assign.

- =
/ =
* = e.g. $x = x + 2 \equiv x += 2$
"increment x by 2"

$x -= 2$ "decrement x by 2"
 $x *= 2$ "multiply x by 2"

- Boolean Expressions.

operators

< >
<= >= or
== != and
 not

< True
False.

- Entering Numbers.

$x = \text{input}(msg)$

~~33~~
33
age

$x = \text{int}(\text{input}(msg))$