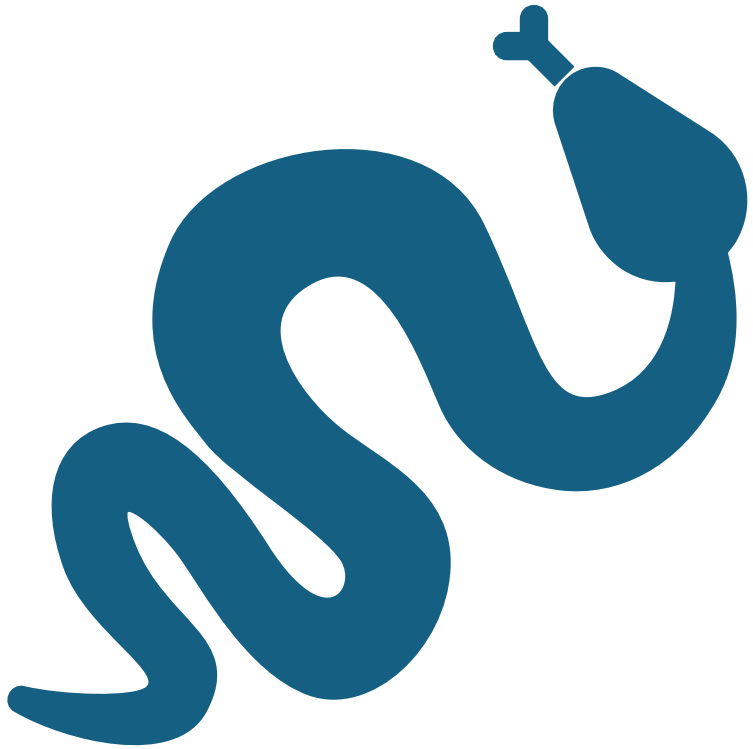


Lesson 1

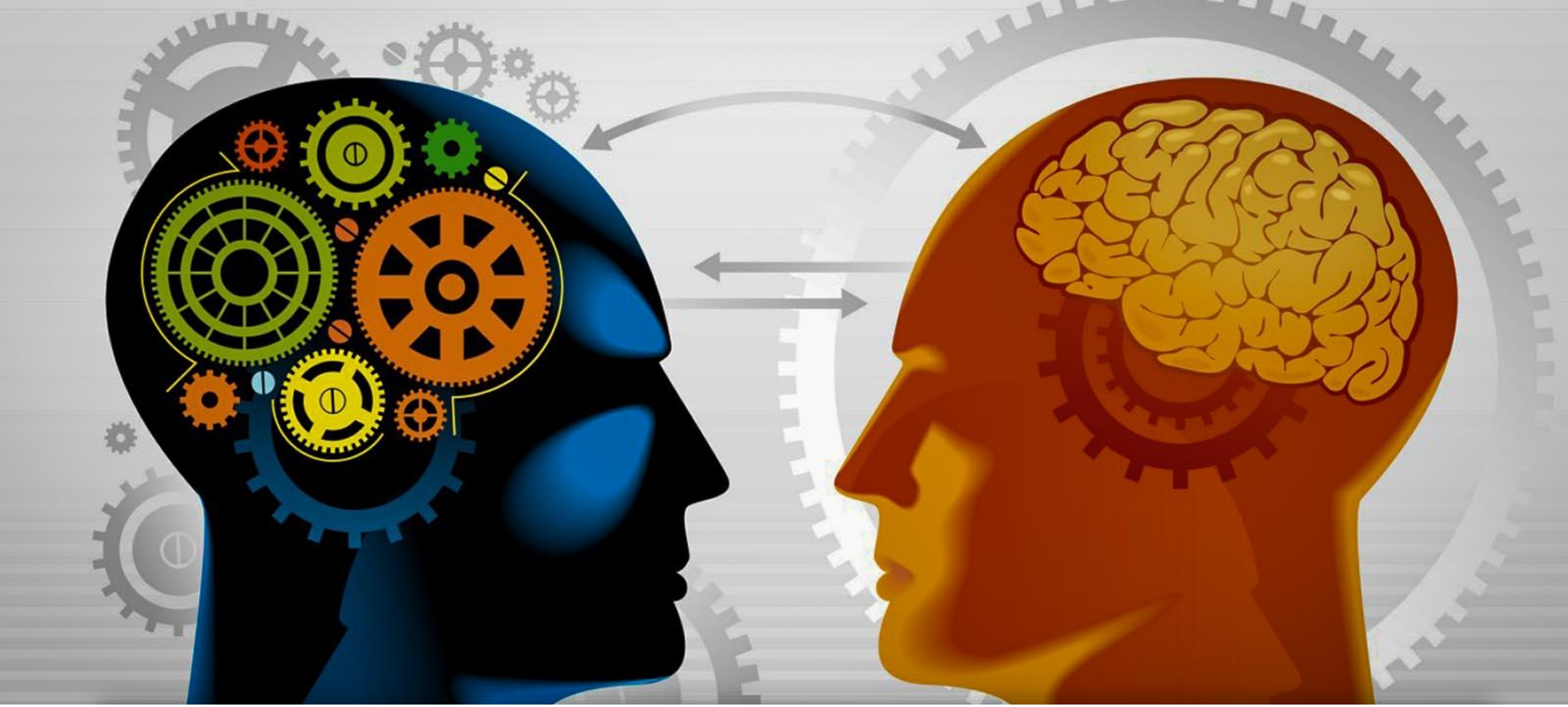
Python Fundamental

How Computer Function

INPUT

PROCESS

OUTPUT



Python

A language to communicate to computer

Math Operators

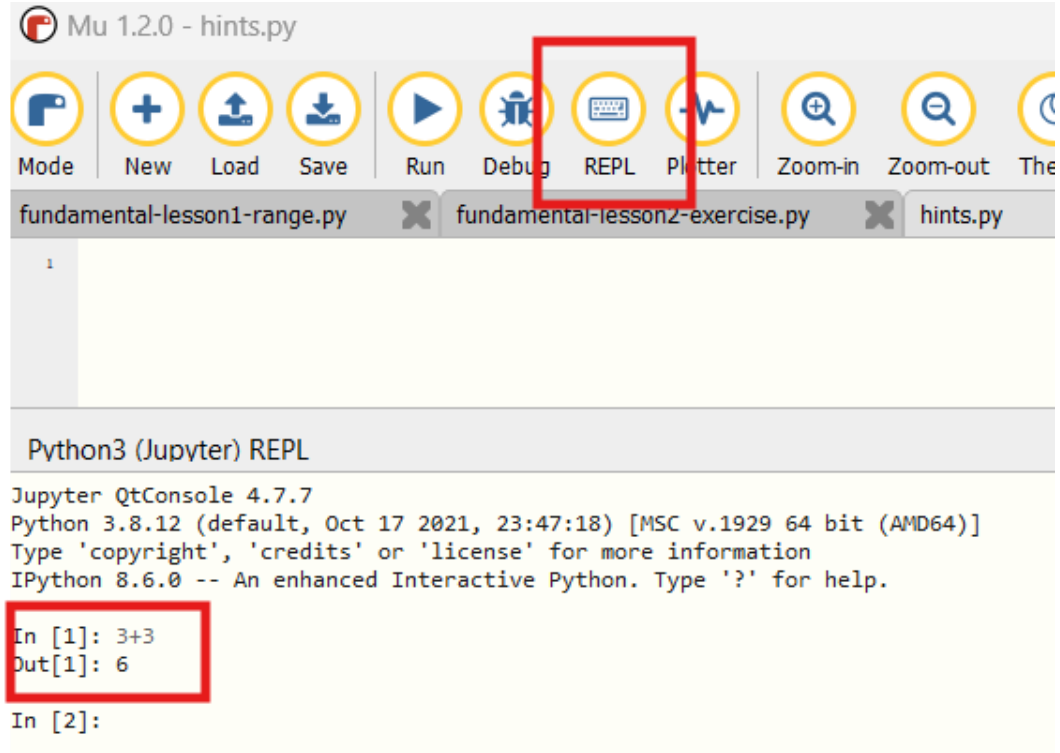
Math Operations	Python Syntax
a + b	a + b
a – b	a - b
a x b	a * b
a ÷ b	a / b
-12 (negative number)	-12
30%	0.3
a % c Modulus	5%3 = 2

Data Types

Data Types	Example
Integer	1 5 20 1000 50200
Float	3.5 4.78 10.0 100.45
Boolean	True False
String	"Boy" "2" "3.5" "%^&*" 'Boy' '2' '3.5' '%^&*'

Use single quote ' or double quote " to wrap a string

Interactive Mode



Math Operations or String Operations?

- What is the output below? Try it out !

3+5

4*3

"3" + "5"

"4" * "3"

The First Output

Create few more lines using print function ...

```
In [1]: print("Hello world ! I'm ", 0, " years old !")
Hello world ! I'm  0  years old !
```

output

```
print("Hello world ! I'm ", 0, " years old !")
```

function

separator

object to print

Syntax

```
print(‘Hello world ‘)
print(‘Hello world’)

a = 3 + 2
a=3+2
```

```
print  (‘Hello world ‘)
print  ("Hello World")
print :(‘Hello world ‘)
print:("Hello World")
```

No space between print and (

No symbols between print and (

Variables

```
1 myage = 1
2 print("Hello world ! I'm ", myage, " years old !")
```

myage is a variable store value of 1

print function OUTPUT the variable content

- Variables are like a drawer in memory blocks store content (integer, float, string, and other data type we'll cover later) for temporary work

Formatted string literals (f-strings)

```
1 myage = 1
2 print("Hello world ! I'm ", myage, " years old !")
```

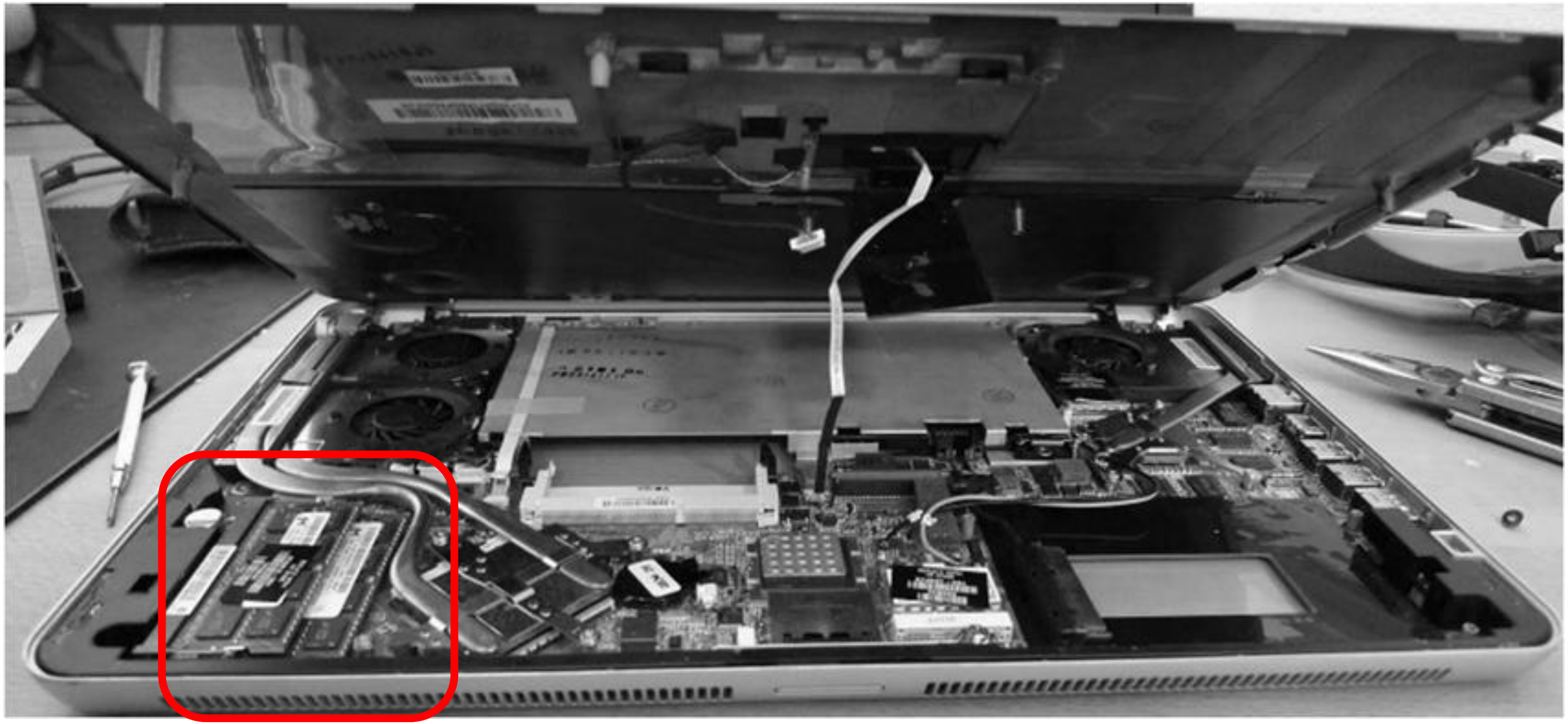
myage is a variable store value of 1

print function OUTPUT the variable content

- F-strings make it easy to include expressions and variables directly in strings.

```
myage = 1
Print(f"Hello word ! I'm {myage} years old !")
```

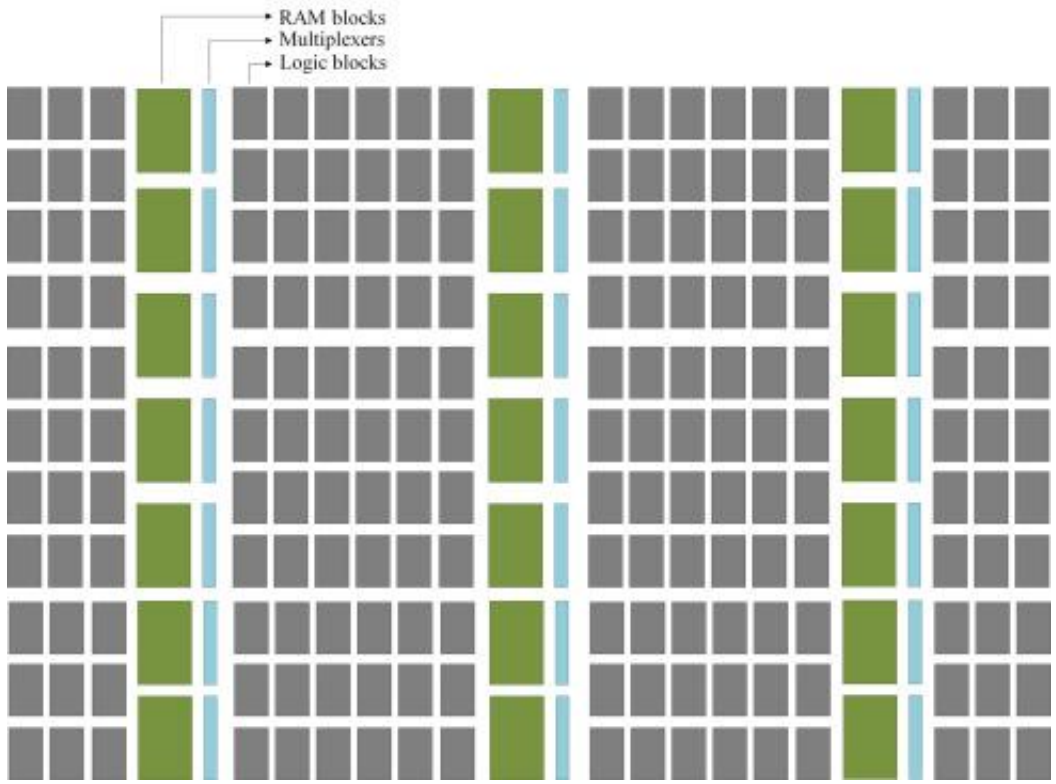
- Use f-strings instead of string concatenation



Memory chips

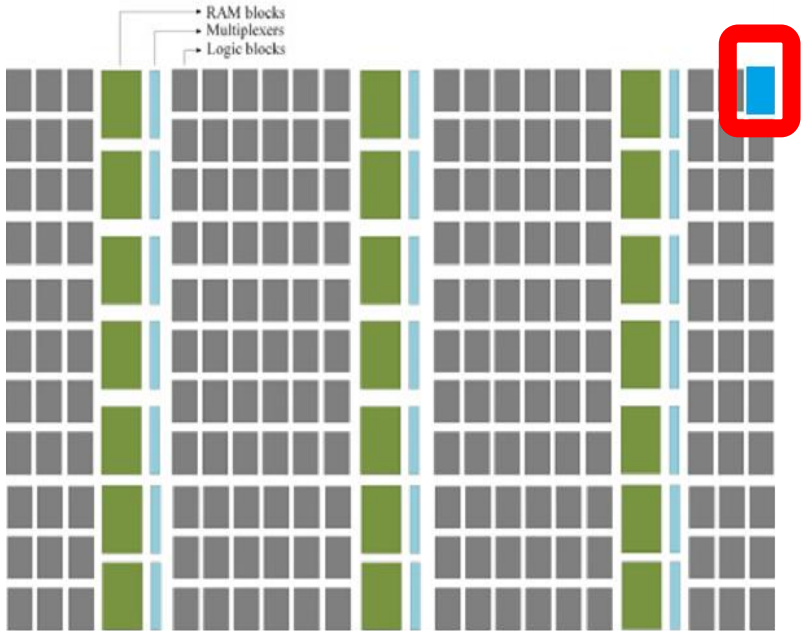
Inside the cover

Computer Memory and Variables



Memory is organized block by block in a computer

Variables




```
1 myage = 1
2 print("Hello world ! I'm ", myage, " years old !")
```

myage is a variable store value of 1

print function OUTPUT the variable content

Above Code:

- Allocate a block from memory named **`myage`**
- Assign value 1 to **`myage`**
- Some other values like string or list need more blocks

Lab

Create few more lines with variable

Print it out

```
1 yourName = ""
2 yourName = input("What is your name: ")
3 print(f"Hello {yourName}"
4
```

Function: **input()**

What does it do?

- You need a VARIABLE [**yourName**] to store user input (allocate memory block)
- Line 1 – allocate a block from memory. The initial value is an empty string “”
- Line 2 – use input function to capture user’s input from keyboard
- Line 3 – print out the variable [**yourName**] to the screen

Rules to name a variable

Rule	Valid ✓	Wrong ✗
start with a letter or the underscore character	myName MyAge _address	%myName
cannot start with a number	types3	3types
only contain alpha-numeric characters and underscores (A-z, 0-9, and _)	user_10	user_10**
case-sensitive	age is not equal to Age or AGE	
cannot be any of the Python keywords	print_out input_age	print = 2 input = 4

Capture User Input – integer and float

- The `input()` function always receives user input **as a string**
- To perform calculations, you must convert it into a number using int() or float()

- for whole number: use `int()`

```
age = int(input("How old are you:"))
```

- For decimals numbers: use `float()`

```
price = float(input("How much for this item:"))
```

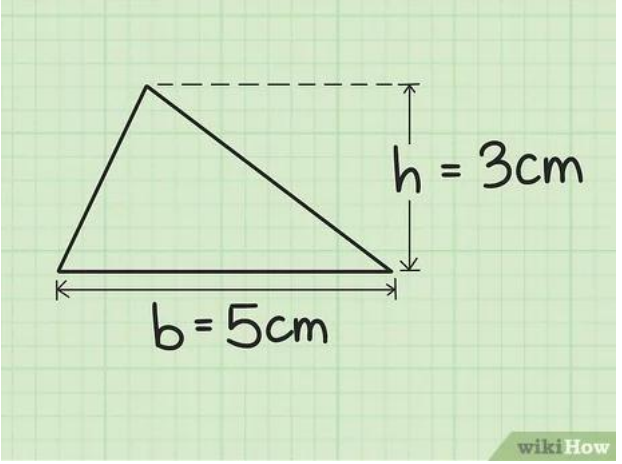
Quiz

- What's wrong with below code? How to correct it?

```
print("Calculate Square Area")
side = 0
area = 0
side = input("What is the side value in cm:")
area = side * side
print(f"The square area is {area} cm")
```

Exercise

Develop a program to calculate the area of a triangle



Hints

1. Declare variables: area, base, and height
2. **Input**: base and height
3. **Process**: calculate the area using the formula above and assign the value to area variable
4. **Output**: Print out the area with a proper statement

Area = (Base * Height) ÷ 2

Area = (5cm * 3cm) ÷ 2
= 15cm ÷ 2
= 7.5cm