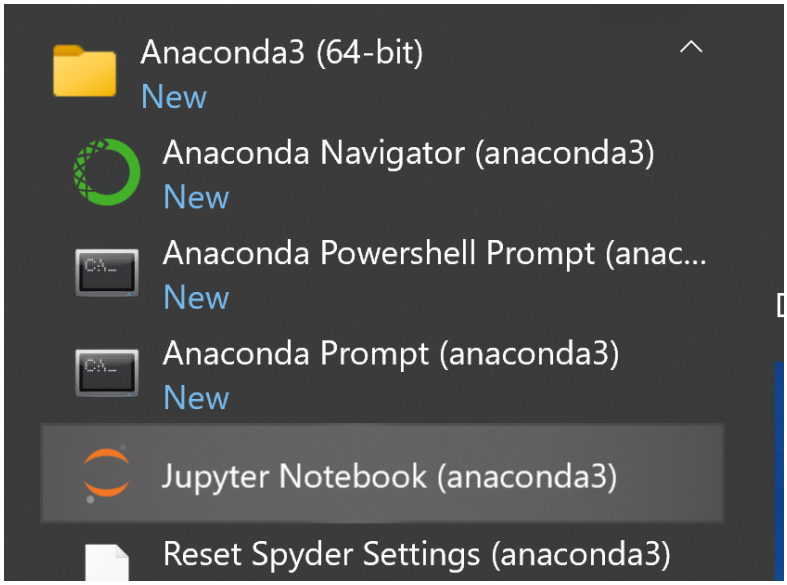
Programming

Learn to program == learning a new language

**Immersive**

Syntax / Grammar




New -> Python 3.

“Hello World!” → Prints “Hello World!”

There are lots of functions (i.e. **print**)
When calling functions we say function_name(...) when calling functions use parenthesis (new in Python 3).
When referring to phrases (called strings) put them in quotes (i.e. “Hello World!”)

print(“Hello World!”)

If you have Anaconda -> In group share the screen and do the typing

If no one in the group has Anaconda -> call me by method below.

If stuck, invite me to the room, type question below:

Group x: question…
[Marcelo] Answer…

**Problem 1**

Get Python to print (“Hello <name1>, <name2>!”)

Hello Jane, Joe, …!

| Group | Done |
|---|---|
| Sample | Done... |
| 1 | Done |
| 2 | Done |
| 3 | Done~ |
| 4 | Done |
| 5 | Done! |
| 6 | DONE. |
| 7 | Done! |

Variables: Variables are ways to refer to a particular value more than once.

Variable == nickname

Marcelo Guerra Hahn -> Marcelo

Marcelo is the variable name for the person Marcelo Guerra Hahn

variable_name = variable_value

```
marcelo = "Marcelo Guerra Hahn"
print(marcelo)
```

```
Marcelo Guerra Hahn
```

Variables, functions, operations (math operation, +, -, /, …)

Operations = calculator operations

1 + 1 Operation (value 1 adds it to the value 2)

Phrase (a.k.a. string) and apply the '+' operator this concatenates the strings.

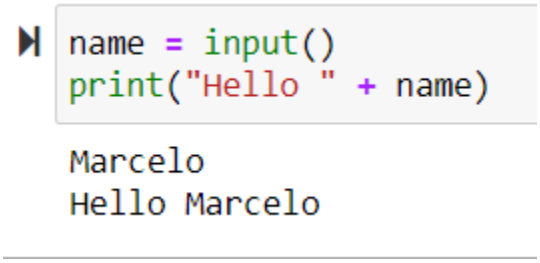
For example:

"Hello" + " " + "World" + "!" → "Hello World!"

```
name = "Marcelo Guerra Hahn"
print("Hello " + name)
```

Python
Name is now "Marcelo Guerra Hahn" (no output)
I need to print "Hello " + name
What is name?
Based on the previous line name is "Marcelo Guerra Hahn"
Replace name with what it is
"Hello " + "Marcelo Guerra Hahn"
I have a +, what does + do?
    +  concatenates
Concatenate "Hello Marcelo Guerra Hahn'
Print

If i want user input, then there is a function named input.




First interactive program, and input, a function call, and a output

| Group | Done |
|---|---|
| Sample | |
| 1 | |
| 2 | |

| | |
|---|---|
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |

**Problem 2**

Write a python program that asks the user for their name and prints:

“Hi <name>, welcome to LIS 511!”

| | |
|---|---|
| Group | Done |
| Sample | Done |
| 1 | Done |
| 2 | Done |
| 3 | Done! |
| 4 | |
| 5 | |
| 6 | DONE |
| 7 | Done |

```
x = input()
y = input()
print(x + y)
```

If x = 1 and y = 2 what will this print?

| | | | | | |
|---|---|---|---|---|---|
| 12 | 1 + 2 | Nothing | | | 3 |
| 3 | 3 I hope | 3 | 3 | | |
| | 3 | 3 | 3 | 1 + 2 | |

| | | | | | |
|---|---|---|---|---|---|
| 12 | 1 + 2 | 1+2 | | 12 | |
| 3 | | I cheated and ran it… XD | 3 | | 3 |
| 3 | 1 + 2 | | 3 | | |
| 12 | 1 + 2 | 1+2 | 3 (?) | 3 | 1+2 |

When using input() the variable will always be a string. If you don't want string i have to specifically tell the computer

There is a function named int (= integer) which does this.

x = int(input())

Take the input and make it a number

```
In [26]: x = input()
         y = input()
         number_x = int(x)
         number_y = int(y)
         print(number_x + number_y)

         1
         2
         3
```

```
In [28]: x = int(input())
         y = int(input())
         print(x + y)

         1
         2
         3
```

**Problem 3**

Ask the user for the birth year (use fake year)

Print “Your age is: <age>”

Assume the person was born after April 1.

If someone was born in 1980, their age is “2021 - 1980 - 1= 40 years old”

| Group | Done |
|---|---|
| Sample | Done |
| 1 | |
| 2 | |
| 3 | Done |
| 4 | Done-ish |
| 5 | |
| 6 | Done-ish? |
| 7 | Done! |

- \+ For numbers is different than + for strings

If you + a string with a number the computer doesn’t know what to do ?

“Age: “ + 40

“Age: 40”
“Age: “ is some sort of number to be added to 40.

Then you get an error due to this confusion.

```
In [30]: birth_year = int(input())
         age = 2021 - birth_year - 1
         print("Your age is: " + str(age))

         1960
         Your age is: 60
```

60 can be interpreted as the number 60 or the string “60”

“Age” will be an error if interpreted as a number, and it’s the string “Age”

**When programming, write one line, try it, next line, try… Too many lines and it’s really hard to figure out an error root cause.**

Auto-correct will look at the output and see if it’s correct.

If input is 1960 output should be “Your age is: 60” (LetsUseData)