

85<sup>a</sup> EDIÇÃO

**SEQ UFRJ**  
20 a 24 de agosto



# Introdução à programação para ciência e engenharia em *Python*

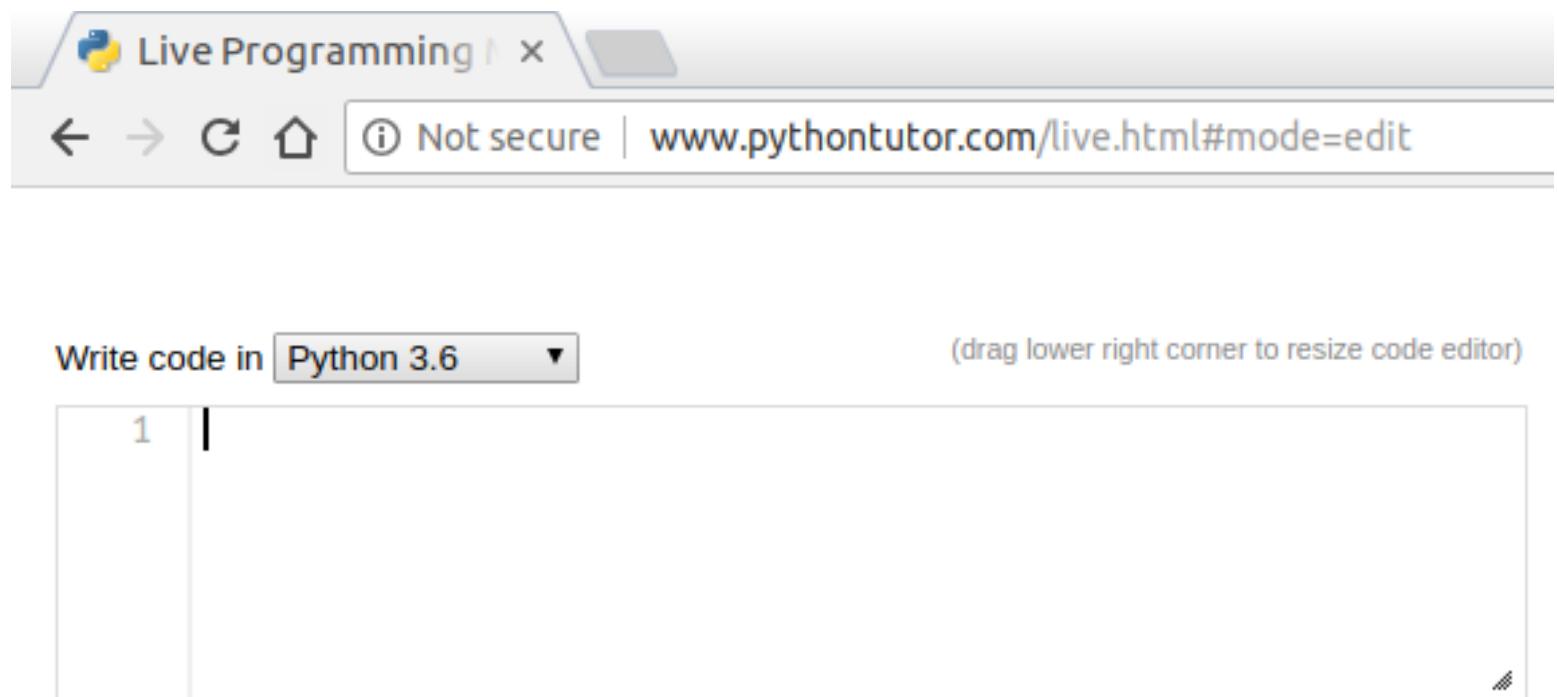
*Iuri Soter Viana Segtovich*

## Parte 2: Lógica e Sintaxe

Tipo lógico e condicionais: (bool, if, elif, else)

# python tutor

[www.pythontutor.com/  
live.html#mode=edit](https://www.pythontutor.com/live.html#mode=edit)



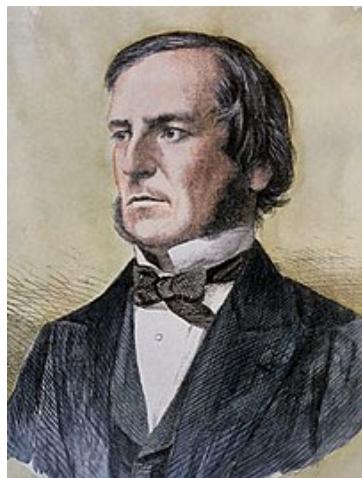
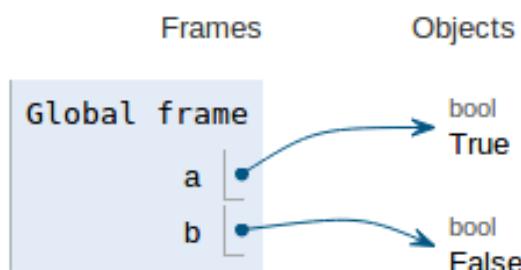
→ line that has just executed

→ next line to execute

# Bool - lógicos

```
1 a=True  
2 b=False  
3 print("a and b:", a and b)  
4 print("not a:", not a)  
→ 5 print("a or b:", a or b)
```

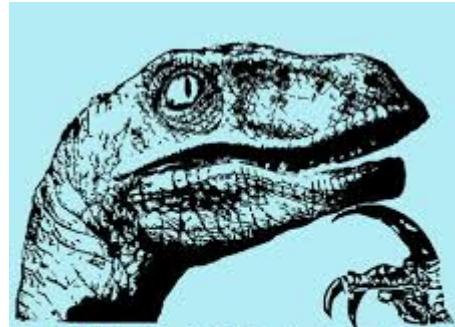
```
a and b: False  
not a: False  
a or b: True
```



A	B	A AND B	A OR B	NOT A
False	False	False	False	True
False	True	False	True	True
True	False	False	True	False
True	True	True	True	False

# Comparações

(number,number) → bool

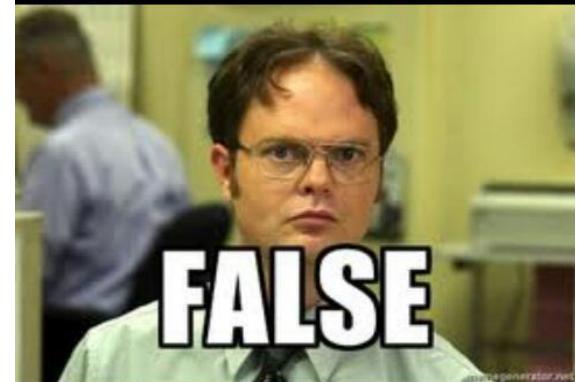
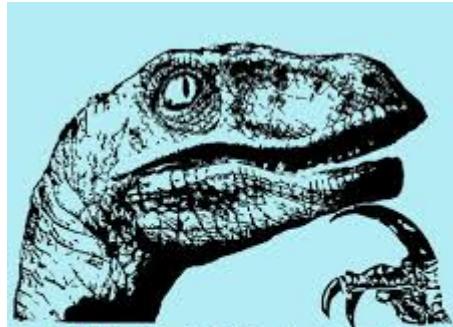


```
print(1<2)
```

```
| True
```

# Comparações

(number,number) → bool



```
print(1>2)
```

```
False
```

# Comparações

(number,number) → bool

```
print(1==2)
print(1<2)
print(1>2)
print(1<=2)
print(1>=2)
print(1!=2)
```

False  
True  
False  
True  
False  
True

# Comparações

com floats

```
1 x=1./7.  
2 print(" 1 2 3 4 5 6 7")  
3 print("y=x+x+x+x+x+x+x")  
4 y=x+x+x+x+x+x+x  
5 print(y)  
6 print(y==1)  
7  
8 tol=1e-14  
9 print(abs(y-1)<tol)  
10
```

```
1 2 3 4 5 6 7  
y=x+x+x+x+x+x+x  
0.9999999999999998  
False  
True
```

- `abs()` - função módulo

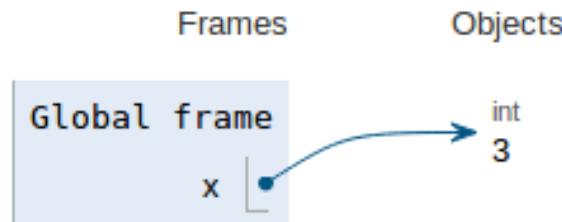
# Condicionais



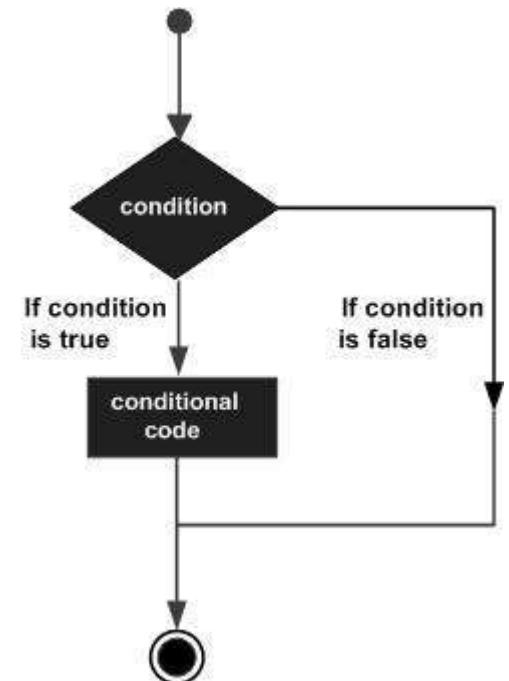
# if

```
1 x=3  
2 if x>0:  
3     print('x positivo')
```

```
x positivo
```

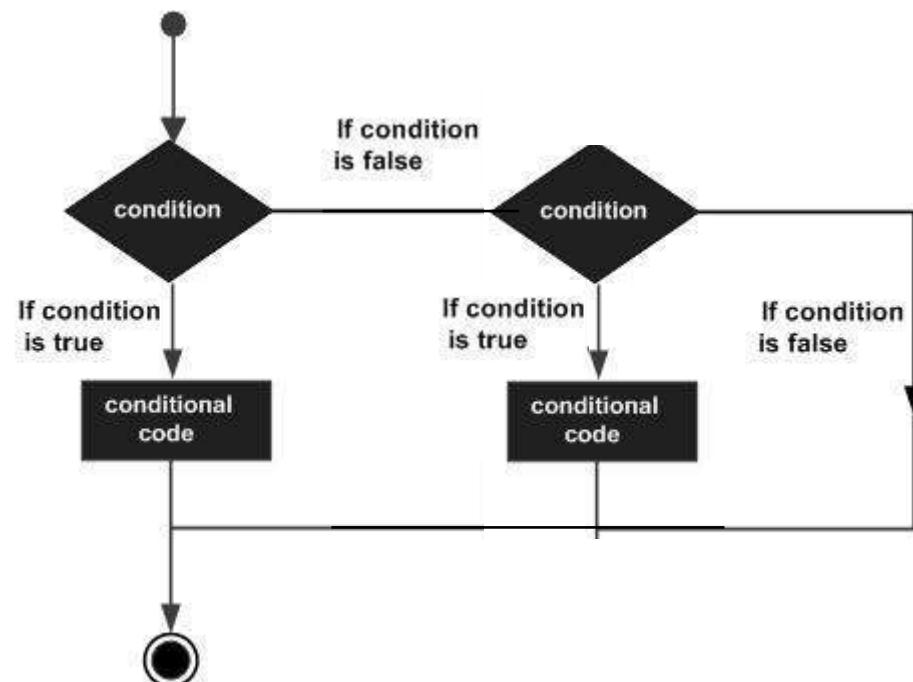
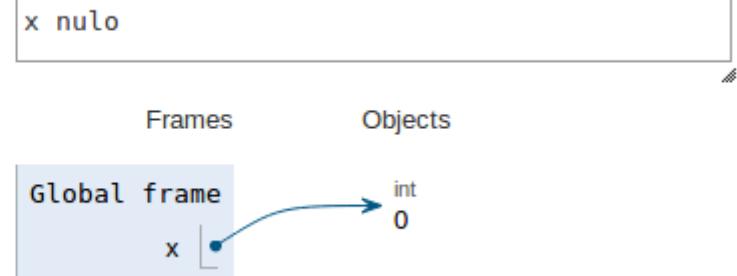


- Dois pontos
- Identação



# elif

```
1 x=0
2 if x>0:
3     print('x positivo')
4 elif x==0:
5     print('x nulo')
```

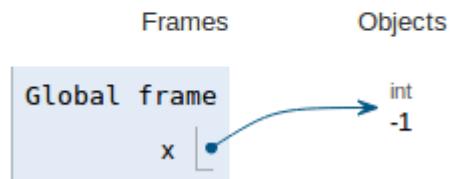


- Dois pontos
- Identação

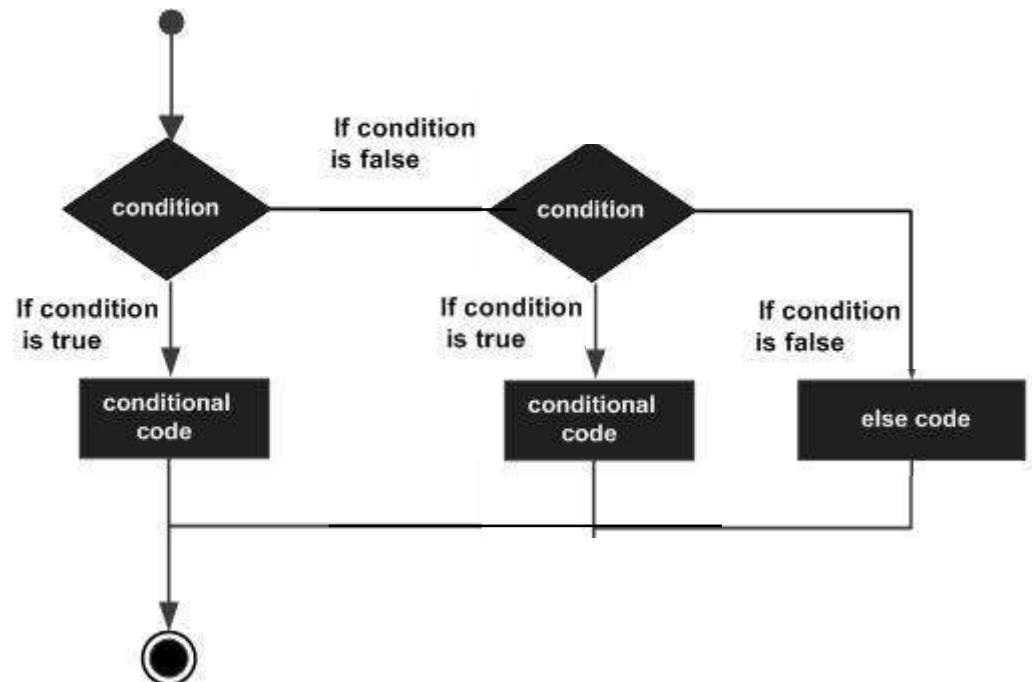
# else

```
1 x=-1
2 if x>0:
3     print('positivo')
4 elif x==0:
5     print('nulo')
6 else:
7     print('''se nao é positivo nem zero
8     deve ser negativo'''')
```

se nao é positivo nem zero  
deve ser negativo



- Dois pontos
- Identação



# Exemplo

- Tirou média maior que 7
- Tirou média final maior que 5

Nota P1 = 5

Nota P2 = 8

Verificar se média maior que 7

Verificar se nota menor que 3

Imprimir média e informação de aprovado ou em prova final ou reprovado direto

Apenas se foi pra PF:

Nota PF = 7

Verificar se nota final maior que 5

Imprimir média final e informação de aprovado ou reprovado

# Comparação com NAN

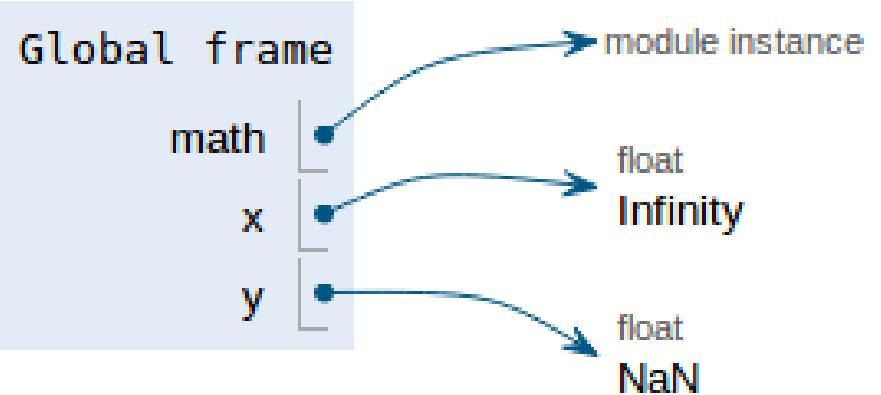
- inf - infinity
- nan – not a number

```
1 import math
2 x=1.02e23
3 print(math.log10(x))
4 x=x*x
5 print(math.log10(x))
6 x=x*x
7 print(math.log10(x))
8 x=x*x
9 print(math.log10(x))
10 x=x*x
11 print(math.log10(x))
12 print(x)
13 y=x-x
14 print(x)
15
```

```
23.008600171761916
46.01720034352383
92.03440068704766
184.06880137409533
inf
inf
nan
```

Frames

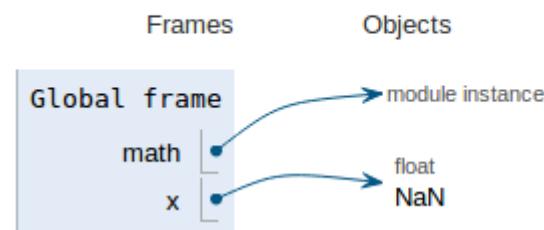
Objects



# Exemplo

```
1 import math
2 x=float("nan")
3 if (x>0):
4     print(x,: positivo")
5 elif x==0:
6     print(x,: nulo")
7 elif x<0:
8     print(x,: negativo")
9 elif math.isnan(x):
10    print(x,: erro tipo not a number")
11 else:
12    print(x,: exceção não prevista!")
13
```

nan : erro tipo not a number



# Referências principais

[https://www.tutorialspoint.com/  
python3/  
python\\_basic\\_syntax.htm](https://www.tutorialspoint.com/python3/python_basic_syntax.htm)

[https://stackoverflow.com/  
search](https://stackoverflow.com/search)

# EXERCÍCIO DE lógica DE PROGRAMAÇÃO

A Scratch-like programming interface with a yellow background featuring a brick pattern. In the center, a small grey robot is positioned on a path made of blue and yellow blocks. A yellow lightbulb is placed on one of the blocks. To the left, there are four control buttons: a blue double arrow, a red double arrow, a white play button, and a green speaker icon. Below these buttons, the text "3-2" is displayed. At the bottom, there is a row of six grey blocks with icons: an upward arrow, a lightbulb, a curved arrow, a circular arrow, a stack of coins, and a "P1" block. On the right side, there are two grey rectangular areas representing scripts. The top script is labeled "MAIN" and contains a "P1" block. The bottom script is labeled "PROC1" and contains three blocks: a stack of coins, a lightbulb, and another "P1" block.

# perguntas

