# Programación. Python

## Tipos mutables e inmutables

Cristóbal Pareja Flores

```python
lista = [1, 2, 3]
print(lista)
print(id(lista))
n = 7
print(n)
print(id(n))
```

```
[1, 2, 3]
2957914260104
7
1417525904
```

```python
lista = [1, 2, 3]
print(lista)
print(id(lista))
lista[0] = 666
print(lista)
print(id(lista))
```

```
[1, 2, 3]
2957914260552
[666, 2, 3]
2957914260552
```

```python
n = 100
print(n)
print(id(n))
n = 666
print(n)
print(id(n))
```

```
100
1417528880
666
2957914520240
```

```
lista = [1, 2, 3]
print(lista)
print(id(lista))
n = 7
print(n)
print(id(n))
```

```
[1, 2, 3]
2957914260104
7
1417525904
```

```
lista = [1, 2, 3]
print(lista)
print(id(lista))
lista[0] = 666
print(lista)
print(id(lista))
```

```
[1, 2, 3]
2957914260552
[666, 2, 3]
2957914260552
```

```
n = 100
print(n)
print(id(n))
n = 666
print(n)
print(id(n))
```

```
100
1417528880
666
2957914520240
```
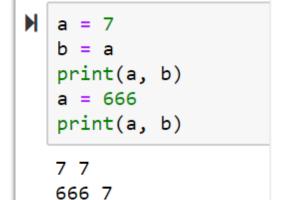
mutable          inmutable

```
def cambio(numeros, a):
    numeros[0] = numeros[0] * 100
    a = a + 1000


lista = [1, 2, 3]
n = 5
print(id(lista), lista)
print(id(n), n)
cambio(lista, n)
print(id(lista), lista)
print(id(n), n)
```

```
2957914915464 [1, 2, 3]
1417525840 5
2957914915464 [100, 2, 3]
1417525840 5
```

```python
lista_a = [1, 2, 3]
lista_b = lista_a
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [666, 2, 3]
```

```
lista_a = [1, 2, 3]
lista_b = lista_a
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [666, 2, 3]
```

```
a = 7
b = a
print(a, b)
a = 666
print(a, b)
```
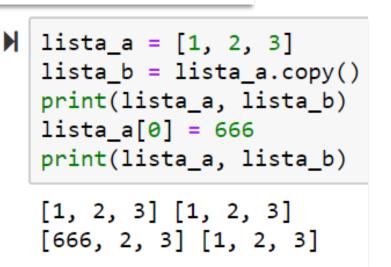
```
7 7
666 7
```

```
lista_a = [1, 2, 3]
lista_b = lista_a
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [666, 2, 3]
```

```
a = 7
b = a
print(a, b)
a = 666
print(a, b)
```

```
7 7
666 7
```

```
lista_a = [1, 2, 3]
lista_b = lista_a.copy()
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [1, 2, 3]
```

```python
lista_a = [1, 2, 3]
lista_b = lista_a
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [666, 2, 3]
```

```python
lista_a = [1, 2, 3]
lista_b = lista_a.copy()
print(lista_a, lista_b)
lista_a[0] = 666
print(lista_a, lista_b)
```

```
[1, 2, 3] [1, 2, 3]
[666, 2, 3] [1, 2, 3]
```

```python
a = 7
b = a
print(a, b)
a = 666
print(a, b)
```

```
7 7
666 7
```

```python
a = [7]
b = a
print(a, b)
a = [666]
print(a, b)
print("--------------------------------")
def cambio(nn):
    nn[0] = nn[0] + 1000
cambio(a)
print(a, b)
```

```
[7] [7]
[666] [7]
--------------------------------
[1666] [7]
```

```python
a = [0, [1, 2]]
b = a
c = a.copy()

import copy
d = copy.deepcopy(a)

print("a = ", a)
print("b = ", b)
print("c = ", c)
print("d = ", d)
print()


a[0] = "cambio"
a[1][1] = "cambio"

print("a = ", a)
print("b = ", b)
print("c = ", c)
print("d = ", d)
```

**Copy y deepcopy**

```
a =  [0, [1, 2]]
b =  [0, [1, 2]]
c =  [0, [1, 2]]
d =  [0, [1, 2]]
```

```
a =  ['cambio', [1, 'cambio']]
b =  ['cambio', [1, 'cambio']]
c =  [0, [1, 'cambio']]
d =  [0, [1, 2]]
```

```
matriz = [[1, 2, 3]] * 3
print(matriz)
matriz[0][0] = 666
print(matriz)
```

**Peligros**

```
[[1, 2, 3], [1, 2, 3], [1, 2, 3]]
[[666, 2, 3], [666, 2, 3], [666, 2, 3]]
```

```
print(matriz[0], id(matriz[0]))
print(matriz[1], id(matriz[1]))
print(matriz[2], id(matriz[2]))
```

```
[666, 2, 3] 2049131588096
[666, 2, 3] 2049131588096
[666, 2, 3] 2049131588096
```

# Catálogo de objetos mutables e inmutables

- *Inmutables*: int, float, decimal, complex, bool, string, tuple, range, frozenset, bytes
- *Mutables*: list, dict, set, bytearray, user-defined classes (salvo que se declaren específicamente como inmutables