



Programación. Python

Tipos mutables e inmutables

```
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
```

```
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

immutable

```
▶ 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
```

▶

```
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]
```

```
▶ 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]
```

```
▶ 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]
```

```
▶ 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]
```

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

```
7 7
666 7
```

```
▶ 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]
```



```
a = [0, [1, 2]]
```

```
b = a
```

```
c = a.copy()
```

```
import copy
```

```
d = copy.deepcopy(a)
```

Copy y deepcopy



```
print("a = ", a)
```

```
print("b = ", b)
```

```
print("c = ", c)
```

```
print("d = ", d)
```

```
print()
```

```
a = [0, [1, 2]]
```

```
b = [0, [1, 2]]
```

```
c = [0, [1, 2]]
```

```
d = [0, [1, 2]]
```

```
a[0] = "cambio"
```

```
a[1][1] = "cambio"
```

```
print("a = ", a)
```

```
print("b = ", b)
```

```
print("c = ", c)
```

```
print("d = ", d)
```

```
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
```

Igualdad e identidad

```
a = [1, 2, 3]
b = a
c = a[:]
print(a == b, a == c)
print(a is b, a is c)
```

```
print(".....")
```

```
a = [[1, 2, 3], [1, 2, 3]]
print(a)
print(a[0] == a[1], a[0] is a[1])
b = [1, 2, 3]
c = [b, b]
print(c[0] == c[1], c[0] is c[1])
```

True True
True False

[[1, 2, 3], [1, 2, 3]]
True False
True True

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)