# DEEP COPY Vs SHALLOW COPY

```
lst1 = [1,2,3,4]
lst 2 = lst1

lst 1  → [1,2,3,4]
lst 2  → [1,2,3,4]
lst 2[1] ⇒ 2

lst2[1] = 1000
lst 2 → [1,1000,3,4]
lst 1 → [1,1000,3,4]
```

same.

```
id (lst1)
id (lst2)
```

same

$$\frac{C}{5} = \frac{F-32}{9}$$

or, $5 \times F - 32 = 9C$

or, $F - 32 = \frac{9C}{5}$

or, $F = \frac{9C}{5} + 32$

```
# copy operation
# Shallow Copy
lst1 = [1,2,3,4]
lst 2 = lst1.copy()

lst 1 → [1,2,3,4]
lst 2 → [1,2,3,4]
lst 2[1] → 2
lst 2[1] = 1000
lst 2 → [1,1000,3,4]
lst 1 → [1,2,3,4]
```

different

```
id (lst 1)
id (lst 2)
```

different

$$\frac{C}{5} = \frac{F+32}{9}$$

x

C - 0 F - 32 or

# shallow copy with nested list

lst1 = [[1,2,3,4],[5,6,7,8]]

lst2 = lst1.copy()

lst1 → [[1,2,3,4],[5,6,7,8]]

lst2 → [[1,2,3,4],[5,6,7,8]]

lst1[1][0] → 5

lst1[1][0] = 100

lst1 → [[1,2,3,4],[100,6,7,8]] → same

lst2 → [[1,2,3,4],[100,6,7,8]]

id(lst1) → difference

id(lst2)

lst1.append([2,3,4,5])

lst1 → [[1,2,3,4],[100,6,7,8],[2,3,4,5]]

lst2 → [[1,2,3,4],[100,6,7,8]]

# deep copy

import copy

lst1 = [1,2,3,4]

lst2 = copy.deepcopy(lst1)

lst2[1] = 100

lst2 → [1,100,3,4] → difference

lst1 → [1,2,3,4]

id(lst2) → difference

id(lst1)

~~###~~ in a normal list shallow copy == deep copy.

lst1 = [[1,2,3], [3,4,5], [5,6,7]]

lst2 = copy.deepcopy(lst1)

lst2[1][0] ⟶ 3

lst2[1][0] ⟹ 100

lst2 ⟶ [[1,2,3], [100,4,5], [5,6,7]]

lst1 ⟶ [[1,2,3], [3,4,5], [5,6,7]] different

id(lst2) ⟶ difference

id(lst1)