Welcome to the

# Python Camp

**Day 04**

## Log into the virtual machine

Username: student

Password: StudentDLH2024

# Content of the course

- Variables and data types
- Logical and arithmetic operations
- Conditionals
- Loops
- Lists
- Dictionaries
- Sorting

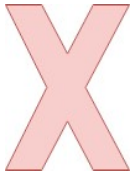
# Sorting algorithms

Sorting can only be applied to items that can be compared to one another.

checklist = [56, 2, 0, -3, 123]

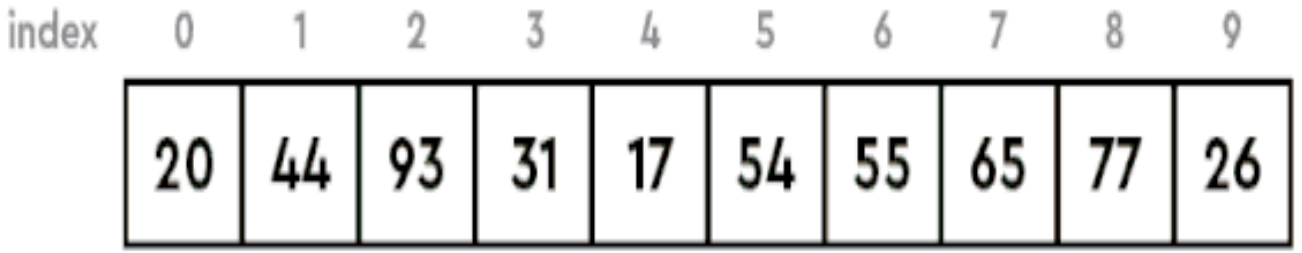
checklist = ["k", "s", "a", "b", "y", "e"]

checklist = ["k", 3, "n", -4, "y", 153, -9, "g"]



# Bubble sort

1. We start from the beginning of the list and compare each pair of adjacent elements.
2. If the elements are in the wrong order (i.e., the current element is greater than the next one), we swap them.
3. We repeat this process until no more swaps are needed, which means the list is sorted.



# Bubble sort (plan)

List given:

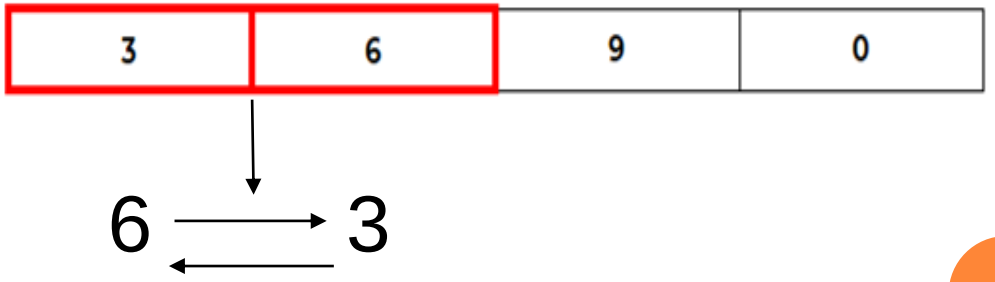

Select the first two items:

# Bubble sort (plan)

Compare them to one another:


6 > 3 ?

If the condition is true (6 is greater than 3), we swap the items:



# Bubble sort (plan)

Take the following two items:


We also compare them to one another:


6 > 9 ?

# Bubble sort (plan)

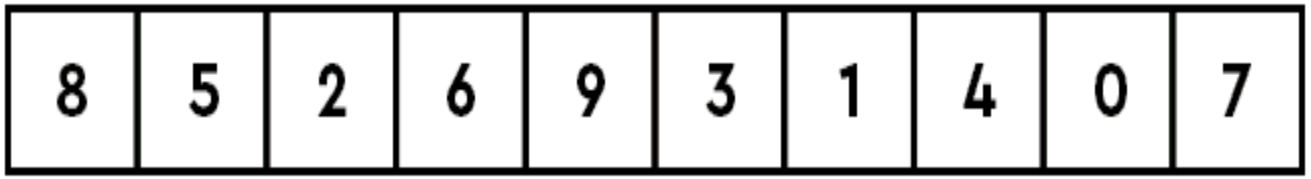
The condition is false (6 is not greater than 9), which means the items remain in their places:

# Now YOUR TURN !

Let’s implement the Bubble Sort algorithm

# Selection sort

1. The input array is divided into two parts: a sorted part and an unsorted part.
2. The algorithm repeatedly finds the minimum element in the unsorted part and swaps it with the leftmost element of the unsorted part, thus expanding the sorted part by one element.



# Selection sort (plan)

List given:


Remember the first item:

# Selection sort (plan)

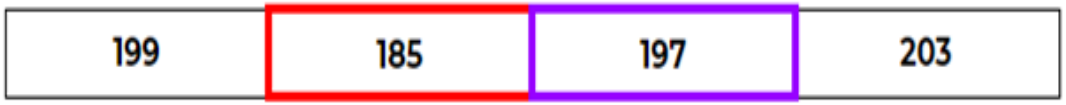
Compare it to the nex
item:


199 > 185 ?

If the condition is true (199 is greater than 185), remember the new item:

# Selection sort (plan)

Compare it to the next item:

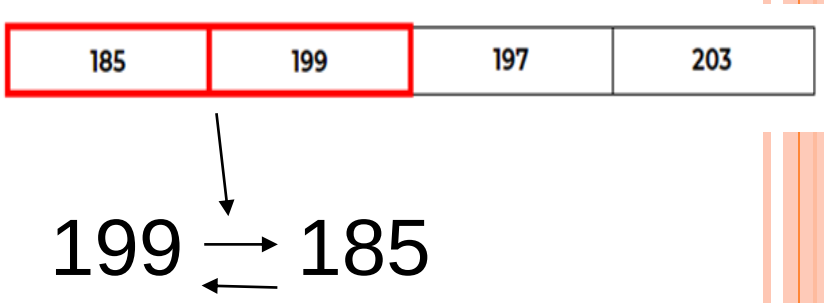



185 > 197 ?

If the condition is false (185 is less than 199), the smallest item remains the same:

# Selection sort (plan)

We compare all the remaining items in this way. If there is no smaller item, we put the smallest one we remembered at the top of the list. The item there goes to the place where the smallest was:



# Now YOUR TURN !

Let’s implement the Selection Sort algorithm

https://dlh.cloud.processmaker.net/webentry/learner-feedback/1