Algorithm

Bubble Sort

Visual Walkthrough

Bubble Sort

- **Sort Problem:**

"Put the items of a list in a certain order".

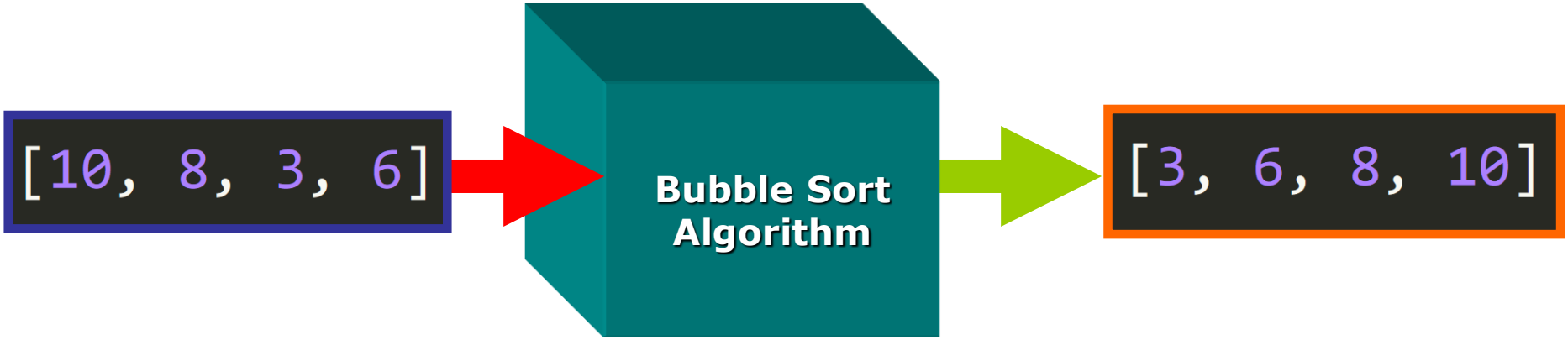
Most Common: Numerical & Lexicographical

Non-decreasing order	**Output has the same elements in a different order (a permutation).**

Bubble Sort

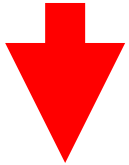
- **Simplest** sorting algorithm.
- Elements move “up” like bubbles.
- Uses a “**swapping**” mechanism.
- Can be used for small lists.
- Not very efficient for large lists.

Binary Search



Bubble Sort

```
[10, 8, 3, 6]
```



Sort

```
[3, 6, 8, 10]
```


Bubble Sort

```
[10, 8, 3, 6]
```

Bubble Sort

```
[8, 10, 3, 6]
```

Bubble Sort

```
[8, 3, 10, 6]
```

Bubble Sort

```
[8, 3, 6, 10]
```

Bubble Sort

```
[3, 8, 6, 10]
```

Bubble Sort

```
[3, 6, 8, 10]
```

Bubble Sort

Sorted!

```
[3, 6, 8, 10]
```

Bubble Sort

Sorted!

```
[3, 6, 8, 10]
```

But the algorithm doesn’t know yet….

Bubble Sort

```
[3, 6, 8, 10]
```

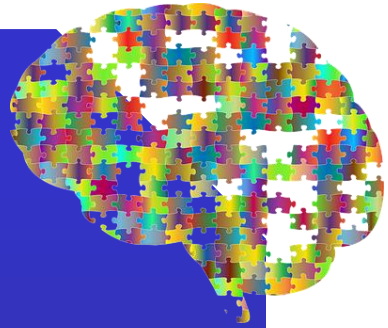
It has to complete all the iterations

Bubble Sort

Sorted!

```
[3, 6, 8, 10]
```

Algorithm



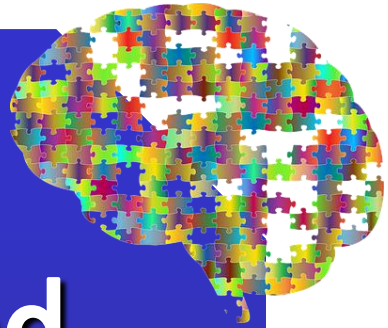
Bubble Sort

- **Start** with the first pair of elements.
- **Swap** the elements if the element located to the left is greater than the element located to the right.

Left-item > Right-item

- **Move** to the next index (next pair of contiguous elements).
- **Repeat** until you reach the end of the list.
- **Repeat** the previous steps once for every element.

Optimized Version



Time to Code!