Algorithm

Selection Sort

Example | Visual

Selection Sort

```
["Python", "Java", "C++", "JavaScript"]
```

Selection Sort

```
["Python", "Java", "C++", "JavaScript"]
```

min: “Python”

Selection Sort

```
["Python", "Java", "C++", "JavaScript"]
```

min: “Java”

Selection Sort

```
["Python", "Java", "C++", "JavaScript"]
```

min: “C++”

Selection Sort

```
["C++", "Java", "Python", "JavaScript"]
```

Selection Sort

```
["C++", "Java", "Python", "JavaScript"]
```

min: “Java”

Selection Sort

```
["C++", "Java", "Python", "JavaScript"]
```

min: “Python”

Selection Sort

```
["C++", "Java", "Python", "JavaScript"]
```

min: “JavaScript”

Selection Sort

```
["C++", "Java", "JavaScript", "Python"]
```

Selection Sort

Sorted

```
["C++", "Java", "JavaScript", "Python"]
```

To the Code!

Algorithm

Selection Sort

Example | Code

```
["Python", "Java", "C++", "JavaScript"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

```
==========> Starting Selection Sort <==========


=========> Outer Loop iteration #1

List: ['Python', 'Java', 'C++', 'JavaScript']
Sorted portion: []
Unsorted portion: ['Python', 'Java', 'C++', 'JavaScript']
The unsorted portion starts at index: 0

--> Inner Loop iteration
Current element: Java
Min element so far: Python
Is the current element smaller than the min element? Yes
Java is now the new min element. It is located at index: 1

--> Inner Loop iteration
Current element: C++
Min element so far: Java
Is the current element smaller than the min element? Yes
C++ is now the new min element. It is located at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: C++
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['Python', 'Java', 'C++', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: C++
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

```
["Python", "Java", "C++", "JavaScript"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “Python”

min_index: 0

```
==========> Starting Selection Sort <==========


=========> Outer Loop iteration #1

List: ['Python', 'Java', 'C++', 'JavaScript']
Sorted portion: []
Unsorted portion: ['Python', 'Java', 'C++', 'JavaScript']
The unsorted portion starts at index: 0

--> Inner Loop iteration
Current element: Java
Min element so far: Python
Is the current element smaller than the min element? Yes
Java is now the new min element. It is located at index: 1

--> Inner Loop iteration
Current element: C++
Min element so far: Java
Is the current element smaller than the min element? Yes
C++ is now the new min element. It is located at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: C++
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['Python', 'Java', 'C++', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: C++
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

```
["Python", "Java", "C++", "JavaScript"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “Java”

min_index: 1

```
==========> Starting Selection Sort <==========


=========> Outer Loop iteration #1

List: ['Python', 'Java', 'C++', 'JavaScript']
Sorted portion: []
Unsorted portion: ['Python', 'Java', 'C++', 'JavaScript']
The unsorted portion starts at index: 0

--> Inner Loop iteration
Current element: Java
Min element so far: Python
Is the current element smaller than the min element? Yes
Java is now the new min element. It is located at index: 1

--> Inner Loop iteration
Current element: C++
Min element so far: Java
Is the current element smaller than the min element? Yes
C++ is now the new min element. It is located at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: C++
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['Python', 'Java', 'C++', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: C++
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

["Python", "Java", "C++", "JavaScript"]

```
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “C++”

min_index: 2

```
==========> Starting Selection Sort <==========


=========> Outer Loop iteration #1

List: ['Python', 'Java', 'C++', 'JavaScript']
Sorted portion: []
Unsorted portion: ['Python', 'Java', 'C++', 'JavaScript']
The unsorted portion starts at index: 0

--> Inner Loop iteration
Current element: Java
Min element so far: Python
Is the current element smaller than the min element? Yes
Java is now the new min element. It is located at index: 1

--> Inner Loop iteration
Current element: C++
Min element so far: Java
Is the current element smaller than the min element? Yes
C++ is now the new min element. It is located at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: C++
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['Python', 'Java', 'C++', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: C++
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

```
["C++", "Java", "Python", "JavaScript"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

```
=========> Outer Loop iteration #2

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++']
Unsorted portion: ['Java', 'Python', 'JavaScript']
The unsorted portion starts at index: 1

--> Inner Loop iteration
Current element: Python
Min element so far: Java
Is the current element smaller than the min element? No
No need to change the min element

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Java
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Java
With the min element found: Java
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

["C++", "Java", "Python", "JavaScript"]

```
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “Java”

min_index: 1

```
=========> Outer Loop iteration #2

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++']
Unsorted portion: ['Java', 'Python', 'JavaScript']
The unsorted portion starts at index: 1

--> Inner Loop iteration
Current element: Python
Min element so far: Java
Is the current element smaller than the min element? No
No need to change the min element

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Java
Is the current element smaller than the min element? No
No need to change the min element

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Java
With the min element found: Java
New list: ['C++', 'Java', 'Python', 'JavaScript']
```

["C++", "Java", "Python", "JavaScript"]

```
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “Python”

min_index: 2

```
==========> Outer Loop iteration #3

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++', 'Java']
Unsorted portion: ['Python', 'JavaScript']
The unsorted portion starts at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Python
Is the current element smaller than the min element? Yes
JavaScript is now the new min element. It is located at index: 3

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: JavaScript
New list: ['C++', 'Java', 'JavaScript', 'Python']

==========> Outer Loop iteration #4

The list is now sorted!
['C++', 'Java', 'JavaScript', 'Python']
```

["C++", "Java", "Python", "JavaScript"]

```
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

min: “JavaScript”

min_index: 3

```
==========> Outer Loop iteration #3

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++', 'Java']
Unsorted portion: ['Python', 'JavaScript']
The unsorted portion starts at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Python
Is the current element smaller than the min element? Yes
JavaScript is now the new min element. It is located at index: 3

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: JavaScript
New list: ['C++', 'Java', 'JavaScript', 'Python']

==========> Outer Loop iteration #4

The list is now sorted!
['C++', 'Java', 'JavaScript', 'Python']
```

```
["C++", "Java", "JavaScript", "Python"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

```
=========> Outer Loop iteration #3

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++', 'Java']
Unsorted portion: ['Python', 'JavaScript']
The unsorted portion starts at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Python
Is the current element smaller than the min element? Yes
JavaScript is now the new min element. It is located at index: 3

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: JavaScript
New list: ['C++', 'Java', 'JavaScript', 'Python']

=========> Outer Loop iteration #4

The list is now sorted!
['C++', 'Java', 'JavaScript', 'Python']
```

```
["C++", "Java", "JavaScript", "Python"]
```

```python
def selection_sort(lst):
    for i in range(len(lst)):

        min_index = i

        for curr_index in range(i+1, len(lst)):
            if lst[min_index] > lst[curr_index]:
                min_index = curr_index

        lst[i], lst[min_index] = lst[min_index], lst[i]
```

```
=========> Outer Loop iteration #3

List: ['C++', 'Java', 'Python', 'JavaScript']
Sorted portion: ['C++', 'Java']
Unsorted portion: ['Python', 'JavaScript']
The unsorted portion starts at index: 2

--> Inner Loop iteration
Current element: JavaScript
Min element so far: Python
Is the current element smaller than the min element? Yes
JavaScript is now the new min element. It is located at index: 3

-> Out of inner loop
Previous list: ['C++', 'Java', 'Python', 'JavaScript']

Swapping the first element in the unsorted portion: Python
With the min element found: JavaScript
New list: ['C++', 'Java', 'JavaScript', 'Python']

=========> Outer Loop iteration #4

The list is now sorted!
['C++', 'Java', 'JavaScript', 'Python']
```

Time to Practice!