Algorithm Implementation. Implement the algorithms indicated for each **data set**. **20 points for the implemented algorithm**.

1. **[23,89, 7, 56, 44] –** Implement the Bubble Sort Algorithm for the Dataset and sort the data into **ascending order**.

Code:

```
def bubble_sort(array1):
    n = len(array1)
    for i in range(len(array1)):
        for j in range(0, len(array1) - i - 1):
            if array1[j] > array1[j + 1]:
                array1[j], array1[j + 1] = array1[j + 1], array1[j]
    print("Bubble sort in Ascending:", array1)

array1 = [23, 89, 7, 56, 44]
bubble_sort(array1)
```

Output:

```
C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\.
Bubble sort in Ascending: [7, 23, 44, 56, 89]

Process finished with exit code 0
```

2. **[12, 78, 91, 34, 62] –** Implement the Insertion Sort Algorithm for the Dataset and sort the data into **ascending order**.

Code:

```
array2 = [12, 78, 91, 34, 62]
print("Array 2 before bubble sort:")
print(array2)
for i in range(1, len(array2)):
    key = array2[i]
    j = i - 1
    while j >= 0 and key < array2[j]:
        array2[j + 1] = array2[j]
        j -= 1
    array2[j + 1] = key
print("Insertion Sort in Ascending:")
print(array2)
```

Output:

```
C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\.
Array 2 before bubble sort:
[12, 78, 91, 34, 62]
Insertion Sort in Ascending:
[12, 34, 62, 78, 91]

Process finished with exit code 0
```

3. **[5, 99, 48, 15, 67] –** Implement the Selection Sort Algorithm for the Dataset and sort the data into **descending order**.

Code:

```
def select_sort(array3):
    print("Array 2 before Selection Sort:")
    print(array3)
    for i in range(len(array3)):
        max_idx = i
        for j in range(i + 1, len(array3)):
            if array3[max_idx] > array3[j]:
                max_idx = j
        array3[i], array3[max_idx] = array3[max_idx], array3[i]
    print("Array 3 after selection sort:", array3)
array3 = [5, 99, 48, 15, 67]
select_sort(array3)
```

Output:

```
C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\.
Array 2 before Selection Sort:
[5, 99, 48, 15, 67]
Array 3 after selection sort: [5, 15, 48, 67, 99]

Process finished with exit code 0
```

4. **[38, 82, 25, 74, 13] –** Implement the Insertion Sort Algorithm for the Dataset and sort the data into **descending order.**

Code:

```
array4 =  [38, 82, 25, 74, 13]
1 usage
def insertsort_des(array4):
    print("Array 4 before Insertion Sort in Descending:")
    print(array4)
    for i in range(1, len(array4)):
        key = array4[i]
        j = i - 1
        while j >= 0 and key < array4[j]:
            array4[j + 1] = array4[j]
            j -= 1
        array4[j + 1] = key
    print("Array 4 after Insertion Sort in Descending:", array4)
array4 =  [38, 82, 25, 74, 13]
insertsort_des(array4)
```

Output:

```
C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\.venv\Scripts\python.exe (
Array 4 before Insertion Sort in Descending:
[38, 82, 25, 74, 13]
Array 4 after Insertion Sort in Descending: [13, 25, 38, 74, 82]

Process finished with exit code 0
```

5. **<u>Copy</u>** all of the values from the second index and third index of the **previous datasets** into **one dataset.** After copying, sort the data into **ascending order** and **descending order** each order of the dataset is inserted into a separate list/array.

Code:

main.py

```
136
137 arrays = [12, 78, 91, 34,62,599, 48, 82, 25]
138 print("In Ascending order:")
139 print(arrays)
140 for i in range(1, len(arrays)):
141     key = arrays[i]
142     j = i - 1
143     while j >= 0 and key < arrays[j]:
144         arrays[j + 1] = arrays[j]
145         j -= 1
146     arrays[j + 1] = key
147
148 arrays = [12, 78, 91, 34,62,599, 48, 82, 25]
149 for i in range(1, len(arrays)):
150     key = arrays[i]
151     j = i - 1
152     while j >= 0 and key < arrays[j]:
153         arrays[j + 1] = arrays[j]
154         j -= 1
155     arrays[j + 1] = key
156     print("In Descending order:")
157     print(arrays)
158
```

Output:

6. Create a new list/array or values copying all of the values from **item number 1 to 4**. Implement the **Selection Sort Algorithm** and sort the data into **ascending order**.

Code:

```python
#6.Create a new list/array or values copying all of
#the values from item number 1 to 4. Implement the Selection
#Sort Algorithm and sort the data into ascending order.
lists = [23,89, 7, 56, 44,12, 78, 91, 34, 62,5, 99, 48, 15, 67,38, 82, 25, 74, 13]
print("Lists before Selection Sort:")
print(lists)
for i in range(len(lists)):
    min_idx = i
    for j in range(i + 1, len(lists)):
        if lists[min_idx] < lists[j]:
            min_idx = j
    lists[i], lists[min_idx] = lists[min_idx], lists[i]
print("Selection sort in Descending order:")
print(lists)
```

Output:

```
C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\.venv\Scripts\python.exe C:\Users\domisiw_e\PycharmProjects\SortingAlgorithm\main.py
Lists before Selection Sort:
[23, 89, 7, 56, 44, 12, 78, 91, 34, 62, 5, 99, 48, 15, 67, 38, 82, 25, 74, 13]
Selection sort in Descending order:
[99, 91, 89, 82, 78, 74, 67, 62, 56, 48, 44, 38, 34, 25, 23, 15, 13, 12, 7, 5]

Process finished with exit code 0
```

7. Print the **even and odd** values of the list/array created in **item number 6**.