

▼ Bubble Sort

```
def customBubbleSort(data):
    lenData = len(data)
    swap = True
    print(f"data = {data}")
    while swap == True:
        swap = False
        for i in range(lenData - 1):
            if data[i] > data[i + 1]:
                swap = True
                data[i], data[i + 1] = data[i + 1], data[i]
        if swap == True:
            print("Genap - Ganjil Sorting")
            for i in range(0, lenData - 1, 2):
                if data[i] > data[i + 1]:
                    data[i], data[i + 1] = data[i + 1], data[i]
            print(data)
            print("ganjil - Genap Sorting ")
            for i in range(1, lenData - 1, 2):
                if data[i] > data[i + 1]:
                    data[i], data[i + 1] = data[i + 1], data[i]
            print(data)
    print()
    return data
```

```
data = [13, 12, 10, 8, 7, 5, 11, 2]
print(customBubbleSort(data))
```

```
data = [13, 12, 10, 8, 7, 5, 11, 2]
Genap - Ganjil Sorting
[12, 13, 8, 10, 5, 7, 2, 11]
ganjil - Genap Sorting
[12, 8, 13, 5, 10, 2, 7, 11]
Genap - Ganjil Sorting
[8, 12, 5, 13, 2, 10, 7, 11]
ganjil - Genap Sorting
[8, 5, 12, 2, 13, 7, 10, 11]
Genap - Ganjil Sorting
[5, 8, 2, 12, 7, 13, 10, 11]
ganjil - Genap Sorting
[5, 2, 8, 7, 12, 10, 13, 11]
Genap - Ganjil Sorting
[2, 5, 7, 8, 10, 12, 11, 13]
ganjil - Genap Sorting
[2, 5, 7, 8, 10, 11, 12, 13]

[2, 5, 7, 8, 10, 11, 12, 13]
```

▼ Selection Sort

```
def customSelectionSort(data):
    print('algoritma modifikasi Selection Sort')
    print(f'data awal = {data}')
    lenData = len(data)
    count = 1
    for i in range(lenData // 2):
        min_idx = i
        print(f'iterasi ke - {i + 1}')
        for j in range(min_idx, len(data)):
            if data[min_idx] > data[j]:
                min_idx = j
        data[i], data[min_idx] = data[min_idx], data[i]
        print(f"urut data minimal : {data} ")
        max_idx = lenData - 1
        for j in range(lenData - 1, i, -1):
            if data[max_idx] < data[j]:
                max_idx = j
        data[lenData - 1], data[max_idx] = data[max_idx], data[lenData - 1]
        print(f"urut data maksimal : {data} ")
        lenData -= 1
    print(f'data urut = {data}')
```

```
data = [10, 2, 5, 8, 1, 20, 7, 12, 4]
customSelectionSort(data)
```

```
↳ algoritma modifikasi Selection Sort
data awal = [10, 2, 5, 8, 1, 20, 7, 12, 4]
iterasi ke - 1
urut data minimal : [1, 2, 5, 8, 10, 20, 7, 12, 4]
urut data maksimal : [1, 2, 5, 8, 10, 4, 7, 12, 20]
iterasi ke - 2
urut data minimal : [1, 2, 5, 8, 10, 4, 7, 12, 20]
urut data maksimal : [1, 2, 5, 8, 10, 4, 7, 12, 20]
iterasi ke - 3
urut data minimal : [1, 2, 4, 8, 10, 5, 7, 12, 20]
urut data maksimal : [1, 2, 4, 8, 7, 5, 10, 12, 20]
iterasi ke - 4
urut data minimal : [1, 2, 4, 5, 7, 8, 10, 12, 20]
urut data maksimal : [1, 2, 4, 5, 7, 8, 10, 12, 20]
data urut = [1, 2, 4, 5, 7, 8, 10, 12, 20]
```