"Sort of" Exercise

Table of Contents

1 Description

Complete the following exercises and submit your answer to KATIE as a single file (archive).

You can complete this exercise either manually (paper and pencil) or by modifying the implementations of the algorithms provided in the textbook and pythonds3 to print status after each iteration.

1. Sort list using *Insertion* sorting
2. Sort list using *Selection* sorting
3. Sort list using *MergeSort*
4. Sort list using *QuickSort*
5. Sort list using *HeapSort* algorithm

The provided output file contains the results of using various algorithms to sort list `[594, 850, 281, 952, 129, 348, 264, 972, 598, 758]`.

The value is marked **red** while under review and **blue** once it's settled in its final position.

2 Algorithms

2.1 Insertion Sort

---

15 16 73 65 38 10 22 79 87 64

15 16 73 65 38 10 22 79 87 64

15 16 73 65 38 10 22 79 87 64

15 16 65 73 38 10 22 79 87 64

15 16 38 65 73 10 22 79 87 64

10 15 16 38 65 73 22 79 87 64

10 15 16 22 38 65 73 79 87 64

10 15 16 22 38 65 73 79 87 64

10 15 16 22 38 65 73 79 87 64

10	15	16	22	38	64	65	73	79	87
10	15	16	22	38	64	65	73	79	87

2.2 Selection Sort

15	16	73	65	38	10	22	79	87	64
10	16	73	65	38	15	22	79	87	64
10	15	73	65	38	16	22	79	87	64
10	15	16	65	38	73	22	79	87	64
10	15	16	22	38	73	65	79	87	64
10	15	16	22	38	73	65	79	87	64
10	15	16	22	38	64	65	79	87	73
10	15	16	22	38	64	65	79	87	73
10	15	16	22	38	64	65	73	87	79
10	15	16	22	38	64	65	73	79	87
10	15	16	22	38	64	65	73	79	87
10	15	16	22	38	64	65	73	79	87

2.3 Merge Sort

```
Splitting [15, 16, 73, 65, 38, 10, 22, 79, 87, 64]

Splitting [15, 16, 73, 65, 38]

Splitting [15, 16]

Splitting [15]

Merging [15]

Splitting [16]

Merging [16]

Merging [15, 16]

Splitting [73, 65, 38]

Splitting [73]

Merging [73]

Splitting [65, 38]

Splitting [65]
```

```
Merging [65]

Splitting [38]

Merging [38]

Merging [38, 65]

Merging [38, 65, 73]

Merging [15, 16, 38, 65, 73]

Splitting [10, 22, 79, 87, 64]

Splitting [10, 22]

Splitting [10]

Merging [10]

Splitting [22]

Merging [22]

Merging [10, 22]

Splitting [79, 87, 64]

Splitting [79]

Merging [79]

Splitting [87, 64]

Splitting [87]

Merging [87]

Splitting [64]

Merging [64]

Merging [64, 87]

Merging [64, 79, 87]

Merging [10, 22, 64, 79, 87]

Merging [10, 15, 16, 22, 38, 64, 65, 73, 79, 87]

[10, 15, 16, 22, 38, 64, 65, 73, 79, 87]
```

2.4 Quick Sort

15	16	73	65	38	10	22	79	87	64

10	15	73	65	38	16	22	79	87	64
10	15	64	65	38	16	22	73	87	79
10	15	16	22	38	64	65	73	87	79
10	15	16	22	38	64	65	73	87	79
10	15	16	22	38	64	65	73	87	79
10	15	16	22	38	64	65	73	79	87
10	15	16	22	38	64	65	73	79	87

2.5 Heap Sort

15	16	73	65	38	10	22	79	87	64
15	16	73	65	64	10	22	79	87	38
15	16	73	87	64	10	22	79	65	38
15	16	73	87	64	10	22	79	65	38
15	87	73	79	64	10	22	16	65	38
87	79	73	65	64	10	22	16	15	38
10	15	16	22	38	64	65	73	79	87

Created: 2021-03-27 Sat 16:55