

DSA using Python

Sorting



Saurabh Shukla (MySirG)

Agenda

- ① Sorting
- ② Various Sorting techniques

Sorting

Arranging data elements in some logical order is known as sorting.

Sorting we are going to cover is also known as internal sorting.

when elements are numbers, sorting means arranging numbers in ascending order (by default)

when elements are strings, sorting means arranging strings in dictionary order (alphabetical) order. (by default)

Various Sorting Algorithms

- ① Bubble Sort
- ② Modified Bubble Sort
- ③ Selection Sort
- ④ Insertion Sort
- ⑤ Quick Sort
- ⑥ Merge Sort
- ⑦ Heap Sort.

Bubble Sort

0 1 2 3 4 5
24 58 11 67 92 43

① (0, 1) (1, 2) (2, 3) (3, 4) (4, 5)

24 11 58 67 43 92

② (0, 1) (1, 2) (2, 3) (3, 4)

11 24 58 43 67 92

③ (0, 1) (1, 2) (2, 3)

11 24 43 58 67 92

④ $(0, 1)$ $(1, 2)$
11 24 43 58 67 92

⑤ $(0, 1)$
11 24 43 58 67 92

Modified Bubble Sort

n elements

Round - k $0 \leq k < n$

no swapping in k^{th} round
means elements are sorted
now, no more rounds to
be executed.

Selection Sort

0	1	2	3	4	5	6	7	8
38	90	47	69	52	88	71	18	20
18	90	47	69	52	88	71	38	20
18	20	47	69	52	88	71	38	90
18	20	38	69	52	88	71	47	90
18	20	38	47	52	88	71	69	90
18	20	38	47	52	88	71	69	90
18	20	38	47	52	69	71	88	90

Insertion Sort

0	1	2	3	4	5	6	7	8	9
50	20	37	91	64	18	43	59	72	81
20	50	37	91	64	18	43	59	72	81
20	37	50	91	64	18	43	59	72	81
20	37	50	91	64	18	43	59	72	81
20	37	50	64	91	18	43	59	72	81
18	20	37	50	64	91	43	59	72	81
18	20	37	43	50	64	91	59	72	81
18	20	37	43	50	59	64	91	72	81
18	20	37	43	50	59	64	72	91	81

18 20 37 43 50 59 64 72 81 91