

Sorting Strategies

I. SELECTION SORT

find lowest value, put it in position 1
then find next-lowest value, put it in position 2
and so on...

15, 8, 2, 3, 13

2, 8, 15, 3, 13

2, 3, 15, 8, 13

2, 3, 8, 15, 13

2, 3, 8, 13, 15

$O(n^2)$

WORST CASE

II. BUBBLE SORT

go through the list comparing adjacent values,
swapping them if out-of-order. do this $n-1$ times,
making one less comparison at the end each time.
"bubble up large values"

15, 8, 2, 3, 13

8, 15, 2, 3, 13

8, 2, 15, 3, 13

8, 2, 3, 15, 13

8, 2, 3, 13, 15

2, 8, 3, 13, 15

2, 3, 8, 13, 15

$O(n^2)$

WORST CASE

III. INSERTION SORT

go from left to right, inserting every new
value into its correct position in the ordered
collection of values you've already seen.
"like ordering a hand of cards"

$O(n^2)$

WORST CASE

15, 8, 2, 3, 13
8, 15, 2, 3, 13
2, 8, 15, 3, 13
2, 3, 8, 15, 13
2, 3, 8, 13, 15

IV. BUCKET SORT

stratify into buckets (e.g. 0-9, 10-19, ...), then sort within buckets, and finally concatenate all buckets' values in order

15, 8, 2, 3, 13

2, 3	8	15, 13
2, 3	8	13, 15

 2, 3, 8, 13, 15

$O(n^2)$
 WORST CASE

V. MERGE SORT

sort each adjacent 2, then each adjacent 4 (via linear merging process), then each adjacent 8 (via linear merging process) and so on...

15, 8, 2, 3, 13
8, 15, 2, 3, 13
8, 15, 2, 3, 13
2, 3, 8, 13, 15

$O(n \log n)$
 WORST CASE

VI. BOGOSORT

no.