

Q Sort the array 64, 34, 25, 12, 11, 22, 40 using bubble sort. what is the time

complexity of selection sort in that best, worst, average cases.

Q

64	34	25	12	11	22	40
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64	34	25	11	12	22	40
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∴ sorted array:

[11, 12, 22, 25, 34, 40, 64]

64	34	11	25	12	22	40
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64	11	34	25	12	22	40
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Selection sort:

11	64	34	25	12	22	40
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Time complexity:

11	64	34	12	25	22	40
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Best case: $O(n)$

11	64	12	34	25	22	40
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Average: $O(n^2)$

11	12	64	34	25	22	40
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Worst case: $O(n^2)$

11	12	64	22	34	25	40
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11	12	22	64	34	34	40
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11	12	22	34	64	40
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11	12	22	34	40	64
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- ③ sort the array 64, 25, 12, 22, 11 using selection sort. what is time complexity of selection sort in the best, worst and average cases.

⑤

64	25	12	22	11
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25	64	12	22	11
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25	12	64	22	11
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25	12	22	64	11
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25	12	22	11	64
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12	25	22	11	64
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12	22	25	11	64
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12	22	11	25	64
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12	11	22	25	64
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11	12	22	25	64
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∴ sorted list is 11, 12, 22, 25, 64

Time complexity:

selection sort:

Best case : $O(n^2)$

Average : $O(n^2)$

worst : $O(n^2)$

Q4) Sort the following elements using insertion sort using brute force approach strategy [38, 27, 43, 3, 9, 82, 10, 15, 88, 52, 60, 5] and analyze time complexity of the algorithm

5)

38	27	43	3	9	82	10	15	88	52	60	5
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27	38	43	3	9	82	10	15	88	52	60	5
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27	38	43	3	9	82	10	5	88	52	60	5
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3	27	38	43	9	82	10	15	88	52	60	5
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3	9	27	38	43	82	10	15	88	52	60	5
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3	9	27	38	43	82	15	88	52	60	5
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3	9	10	15	27	38	43	82	88	52	60	5
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3	9	10	15	27	38	43	52	82	88	60	5
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3	5	9	10	27	38	43	52	60	82	88	52
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3	5	9	10	15	27	38	43	52	60	82	88
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Time complexity : worst case : $O(n^2)$

Average case : $O(n^2)$

Best case : $O(n)$

⑤ Given array of $[4, -2, 5, 3, 10, -5, 2, 8, -3, 6, 7, -4, 1, 9, -1, 0, -6, 8, 11, -9]$ integers

sort the following elements using insertion sort using bubble sort approach strategy. analyse complexity of algorithm.

⑤ Insert: 4 = $[4]$
 Insert: -2 = $[-2, 4]$
 Insert: 5 = $[-2, 4, 5]$
 Insert: 3 = $[-2, 3, 4, 5]$
 Insert: 10 = $[-2, 3, 4, 5, 10]$
 Insert: -5 = $[-5, -2, 3, 4, 5, 10]$
 Insert: 2 = $[-5, -2, 2, 3, 4, 5, 10]$
 Insert: 8 = $[-5, -2, 2, 3, 4, 5, 8, 10]$
 Insert: -3 = $[-5, -3, -2, 2, 3, 4, 5, 8, 10]$
 Insert: 6 = $[-5, -3, -2, 2, 3, 4, 5, 6, 8, 10]$
 Insert: 7 = $[-5, -3, -2, 2, 3, 4, 5, 6, 7, 8, 10]$
 Insert: -4 = $[-5, -4, -3, -2, 2, 3, 4, 5, 6, 7, 8, 10]$
 Insert: 1 = $[-5, -4, -3, -2, 1, 2, 3, 4, 5, 6, 7, 8, 10]$
 Insert: 9 = $[-5, -4, -3, -2, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$
 Insert: -1 = $[-5, -4, -3, -2, -1, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$
 Insert: 0 = $[-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$
 Insert: -6 = $[-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]$
 Insert: 11 = $[-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11]$

Time complexity: Best: $O(n)$
 Average: $O(n^2)$
 Worst: $O(n^2)$