INSERTION SORT

Input: unsorted array. Example: [22, 27, 16, 2, 18, 6].

Output: sorted array of input. Example: [2, 6, 16, 18, 22, 27].

Step 0:

22	27	16	2	18	6

Step 1: Assume the first element is sorted.

22	27	16	2	18	6

Step 2: Take the next element 27.

22 < 27 then array of first two element is sorted.

22	27	16	2	18	6

Step 3: Take the next element 16.

22	27	16	2	18	6

16 < 22 and 27 then place 16 in an appropriate place and shift bigger elements to the right.

16	22	27	2	18	6

Step 4: Take the next element 2.

16	22	27	2	18	6

2 < 16, 22 and 27 then place it in an approptiate place and shift bigger elements to the right.

2	16	22	27	18	6

Step 5: Take the next element 18.

2	16	22	27	18	6

18 < 22 and 27 then place it in an appropriate place and shift bigger elements to the right.

2	16	18	22	27	6

Step 6: Take the next element 6.

2	16	18	22	27	6

6 < 16, 18, 22 and 27 then place it in an appropriate place and shift bigger elements to the right.

2	6	16	18	22	27

Best Case of Insertion Sort: O(n)

Average Case of Insertion Sort: O(n^2)

Worst Case of Insertion Sort: O(n^2)

Question: After the array is sorted, the number 18 is included in which of the cases?

Answer: The number 18 is included Average Case because the number 18 is around the middle of the array.

Question: Sort the array [7, 3, 5, 8, 2, 9, 4, 15, 6] using Insertion Sort. (first 4 step)

Step 0:

7	3	5	8	2	9	4	15	6

Step 1: Take the next element 3.

7	3	5	8	2	9	4	15	6

3 < 7 then place it in an appropriate place and shift bigger elements to the right.

3	7	5	8	2	9	4	15	6

Step 2: Take the next element 5.

3	7	5	8	2	9	4	15	6

5 < 7 then place it in an appropriate place and shift bigger elements to the right.

3	5	7	8	2	9	4	15	6

Step 3: Take the next element 8.

3	5	7	8	2	9	4	15	6

3, 5, and 7 < 8 then the array of first four elements is already sorted.

Step 4: Take the next element 2.

3	5	7	8	2	9	4	15	6

2 < 3, 5, 7 and 8 then place it in an appropriate place and shift bigger elements to the right.

2	3	5	7	8	9	4	15	6