

# Selection sort and Insertion sort

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## Aim:

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To write a program to perform selection sort and insertion sort using python programming.

## Equipment's required:

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1. Hardware – PCs
2. Anaconda – Python 3.7 Installation / Moodle-Code Runner

## Algorithm:

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### Selection Sort Algorithm:

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1. Set the first unsorted element as the minimum
2. For each of the unsorted elements, check if the element  $<$  current minimum.
3. If yes, set the element as the new minimum.
4. Swap minimum with first unsorted position.
5. Repeat the steps 2 and 3 for all the elements in the array.

### Insertion Sort Algorithm:

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1. Set the first element as sorted element  $j$ .
2. For each unsorted element  $X$ , check if current sorted element  $j > X$ .
3. If yes, move sorted element to the right by 1.
4. Break the loop and insert  $X$ .
5. Repeat the steps 2 to 4 for sorting all the elements in the array.

## Program:

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i) #Selection Sort

```
'''
```

```
Program to sort the elements in the list using the Selection Sort algorithm  
Developed by: Tamizhselvan .R
```

```

RegisterNumber: 22002952
'''
def selectionSort(array, size):

    for ind in range(size):
        min_index = ind

        for j in range(ind + 1, size):

            if array[j] < array[min_index]:
                min_index = j

        (array[ind], array[min_index]) = (array[min_index], array[ind])

arr = eval(input())
size = len(arr)
selectionSort(arr, size)
print(arr)

```

## ii) #Insertion Sort

```

'''
Program to sort the elements in the list using the Insertion Sorting Alg
Developed by: Tamizh selvan.R
RegisterNumber: 22002952
'''
def insertion_sort(nums):
    for i in range(1, len(nums)):
        item_to_insert = nums[i]
        j = i - 1
        while j >= 0 and nums[j] > item_to_insert:
            nums[j + 1] = nums[j]
            j -= 1
        nums[j + 1] = item_to_insert

list_of_nums = eval(input())
insertion_sort(list_of_nums)
print(list_of_nums)

```

## Output:

	Input	Expected	Got	
✓	[12, 34, 7, 45, 86, 8]	[7, 8, 12, 34, 45, 86]	[7, 8, 12, 34, 45, 86]	✓
✓	[120, 45, 68, 250, 176]	[45, 68, 120, 176, 250]	[45, 68, 120, 176, 250]	✓

Passed all tests! ✓

**Correct**

Marks for this submission: 10.00/10.00.

	Input	Expected	Got	
✓	[12, 34, 7, 45, 86, 8]	[7, 8, 12, 34, 45, 86]	[7, 8, 12, 34, 45, 86]	✓
✓	[120, 45, 68, 250, 176]	[45, 68, 120, 176, 250]	[45, 68, 120, 176, 250]	✓

Passed all tests! ✓

**Correct**

Marks for this submission: 10.00/10.00.

## Result:

Thus the program is written to perform selection sort and insertion sort using python programming.