

Section - 2

Question:- ① Write python program for a selection sort.

Answer:- Selection Sort:-

Algorithm is an in-place comparison based algorithm.

The algorithm divides the array into two segments.

- ① The sorted part at the left end.
- ② The remaining unsorted part at the right end.

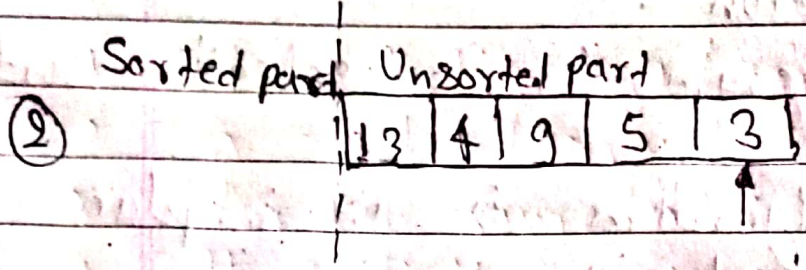
The algorithm involves finding the minimum or maximum elements in the unsorted portion of the array and then placing it in the correct position of the array.

⊗ How does a selection sort work ?

①

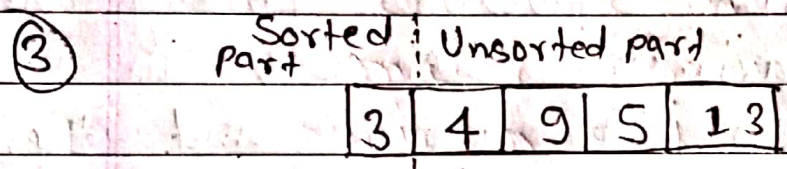
13	4	9	5	3
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Given an array, we need to sort it using Selection sort. Hence, we must select the smallest element in the array.



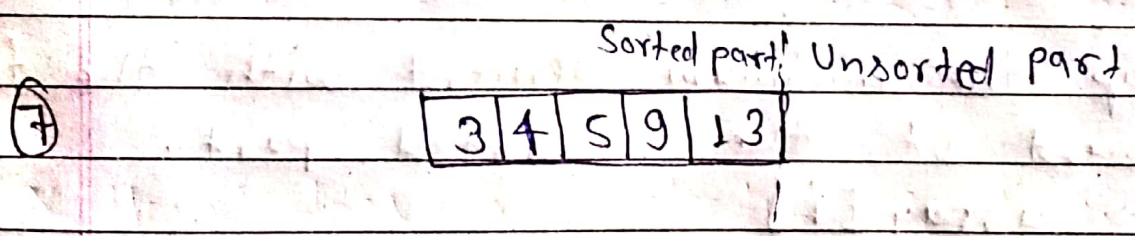
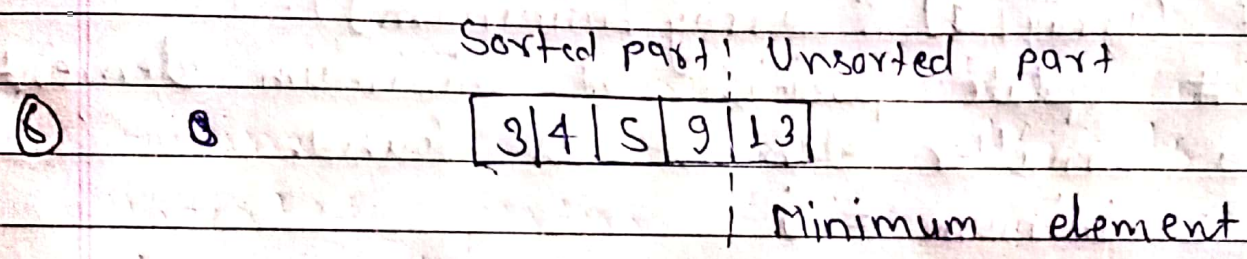
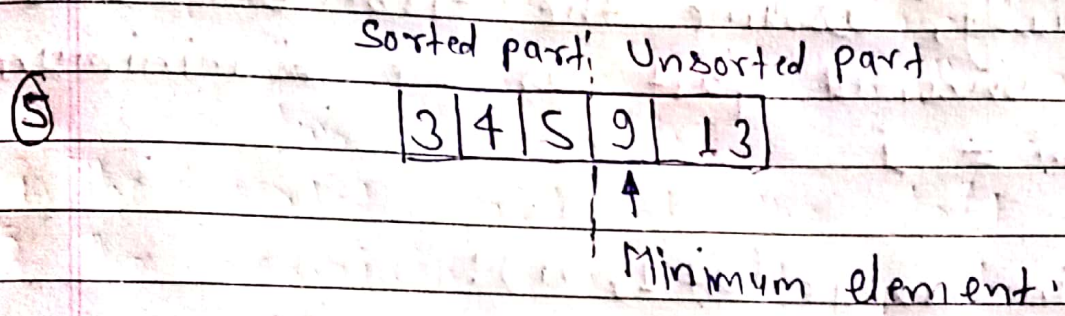
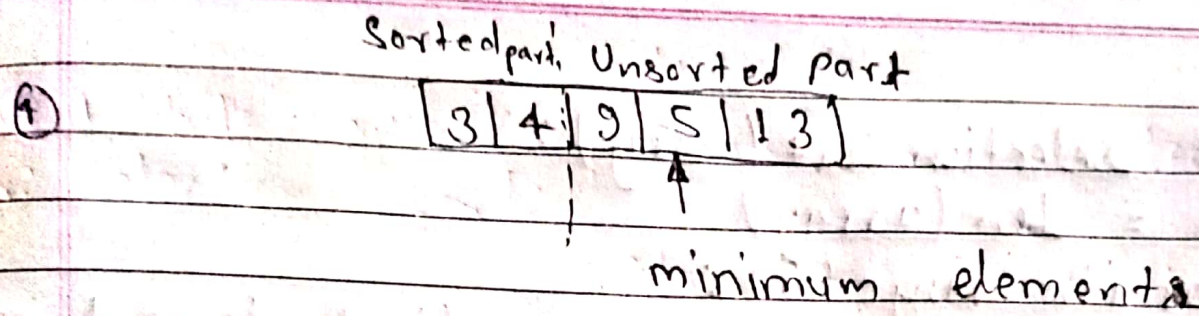
minimum element

The minimum element is swapped with the first element of the unsorted array. This element will become a part of the sorted array.



Minimum element

In every iteration, a new minimum element is found in the unsorted part of the array and swapped with the first element of the unsorted part of the array.



The process continues until there are no more element left in the unsorted part

(*) Implementation:-

Now that we know how the algorithm works in theory, let's see how to write the code in implement it.

```

1 def selectionSort(array):
2     n = len(array)
3     for i in range(n):
4         # Initially, assume the first element of
           unsorted part as the minimum.
5         minimum = i
6
7         for j in range(i+1, n):
8             if (array[j] < array[minimum]):
9                 # update position of minimum element
           a smaller element is found.
10                minimum = j
11
12            # Swap the minimum element with the first
           element of the unsorted part.
13            temp = array[i]
14            array[i] = array[minimum]
15            array[minimum] = temp
16
17            return array
18
19            # Driver code
20            array = [13, 4, 9, 5, 3, 16, 12]
21            print(selectionSort(array))

```