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**Question 1**

Consider the selection sort algorithm given below. Selection sort algorithm sorts  $n$  numbers stored in array  $A$  by first finding the smallest element of  $A$  and exchanging it with the element in  $A[1]$ . Then find the second smallest element of  $A$ , and exchange it with  $A[2]$ . Continue in this manner for the first  $n - 1$  elements of  $A$ .

**SELECTION-SORT( $A$ )**

1.  $n = A.length$
2. for  $j = 1$  to  $n - 1$
3.      $smallest = j$
4.     for  $i = j + 1$  to  $n$
5.         if  $A[i] < A[smallest]$
6.              $smallest = i$
7.     exchange  $A[j]$  with  $A[smallest]$

Write a program to sort a set of numbers using selection sort algorithm

**Question 2**

- a. Write a program to read a set of numbers and store them on an array.
- b. Write function named as partition to divide the array into two parts according to the partition point.

**PARTITION( $A, p, r$ )**

- 1  $x = A[r]$
- 2  $i = p - 1$
- 3     **for**  $j = p$  **to**  $r - 1$
- 4         **if**  $A[j] \leq x$
- 5             **then**  $i = i + 1$
- 6             exchange  $A[i]$  with  $A[j]$
- 7     exchange  $A[i + 1]$  with  $A[r]$
- 8     **return**  $i + 1$

- c. Call the function from the main program and display the array.

**Lab Exercise 7 – Selection Sort and Quick Sort Algorithm**

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- d. Modify the program to sort the elements of the array using quick sort algorithm.

**QUICKSORT** ( $A, p, r$ )

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1  if  $p < r$ 
2     $q = \text{PARTITION}(A, p, r)$ 
3    QUICKSORT ( $A, p, q-1$ )
4    QUICKSORT ( $A, q+1, r$ )
```