EXPERIMENT-05

5) Implement Quick sort and observe the execution time for various input sizes(Average, Worst, Best).

AIM: To Implement Quick sort and observe the execution time for various input sizes(Average, Worst, Best).

ALGORITHM:

```
function quicksort(array, low, high)
    if low < high
        // Partition the array
        pivotIndex = partition(array, low, high)
        // Recursively apply quicksort to the subarrays
        quicksort(array, low, pivotIndex - 1)
        quicksort(array, pivotIndex + 1, high)
    end if
end function
function partition(array, low, high)
    // Select the pivot element (usually the last element in the range)
    pivot = array[high]
    // Index of the smaller element
    i = low - 1
    // Traverse through the array from low to high - 1
    for j = low to high – 1
        if array[j] <= pivot
            i = i + 1
            // Swap elements at i and j
            swap(array, i, j)
        end if
    end for
    // Swap the pivot element with the element at i+1
    swap(array, i + 1, high)
    // Return the partition index
    return i + 1
end function
function swap(array, index1, index2)
    temp = array[index1]
```

```
array[index1] = array[index2]
array[index2] = temp
end function
```

SOURCE CODE:

```
#include<stdio.h>
void quicksort(int a[25],int  low, int  high){
  int i, j, pivot, temp;
  if(low<high){
    pivot= low;
    i=low;
    j=high;
    while(i<j)
{
      while(a[i]<=a[pivot]&&i<high)
        i++;
      while(a[j]>a[pivot])
        j--;
      if(i<j)
{
        temp=a[i];
       a[i]=a[j];
        a[j]=temp;
      }
    }
    temp=a[pivot];
    a[pivot]=a[j];
    a[j]=temp;
    quicksort(a,low,j-1);
    quicksort(a,j+1,high);
  }
}
int main(){
  int i,n, a[25];
  printf("How many elements are u going to enter?: ");
  scanf("%d",&n);
  printf("Enter %d elements: ", n);
  for(i=0;i<n;i++)
    scanf("%d",&a[i]);
  quicksort(a,0, n-1);
  printf("Order of Sorted elements: ");
  for(i=0;i<n; i++)
    printf(" %d",a[i]);
  return 0;
}
```

OUTPUT:

```
How many elements are u going to enter?: 5
Enter 5 elements:
 50
40
30
20
10
Order of Sorted elements:  10 20 30 40 50
```

CONCLUSION: The above program is executed successfully to Implement Quick sort and observe the execution time for various input sizes(Average, Worst, Best).