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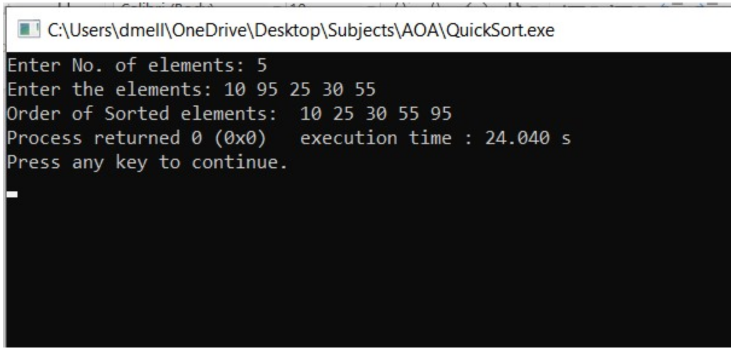
Experiment 3: Quick Sort

```
#include<stdio.h>
void quicksort(int number[25],int first,int last)
{
        int i, j, pivot, temp;
        if(first<last)
        {
                pivot=first;
                i=first;
                j=last;
                while(i<j)
                {
                        while(number[i]<=number[pivot]&&i<last)
                              i++;
                        while(number[j]>number[pivot])
                              j--;
                        if(i<j)
                        {
                                temp=number[i];
                                number[i]=number[j];
                                number[j]=temp;
                        }
                }
                temp=number[pivot];
                number[pivot]=number[j];
                number[j]=temp;
                quicksort(number,first,j-1);
                quicksort(number,j+1,last);
        }
}
int main()
{
        int i, count, number[25];
        printf("Enter No. of elements: ");
        scanf("%d",&count);
        printf("Enter the elements: ");
        for(i=0;i<count;i++)
              scanf("%d",&number[i]);
        quicksort(number,0,count-1);
        printf("Order of Sorted elements: ");
        for(i=0;i<count;i++)
              printf(" %d",number[i]);
        return 0;
}
```

Output



```
Enter No. of elements: 5
Enter the elements: 10 95 25 30 55
Order of Sorted elements:  10 25 30 55 95
Process returned 0 (0x0)   execution time : 24.040 s
Press any key to continue.
```

PostLab:

Space Complexity of Quick sort:
The space complexity is calculated based on the space used in the recursion stack.
The worst case space used will be O(n) .
The average case space used will be of the order O(log n).
The worst case space complexity becomes O(n), when the algorithm encounters its worst case where for getting a sorted list, we need to make n recursive calls