AOA PRACTICAL LAB 1

Name: Brendan Lucas, Roll No:8953, Div: SE Comp B

Source Code:

```
#include <iostream>
#include <cstdlib>
using namespace std;

/int*/void selectionsort(int *arr,int n)
{
	//Declaring the variables
	int j,i,temp,min,sort;
	//int run=0;

	//First for loop
	for(i=0;i<n-1;i++)
	{
		//Set minimum varible index to current index
		min=i;

		//To check if other elements in array are sorted
		sort=0;

		//Second for loop
		for(j=i+1;j<n;j++)
		{
			//if current element is less than the min element, then make current element as min
			if(arr[min]>arr[j])
			{
				min=j;
			}

			//if the unsorted part of array is in correct order
			if(arr[j-1]<arr[j])
			{
				sort++;
			}
			//run++;
		}

		//if min element is not current element, then swap
		if(min!=i)
		{
			temp=arr[min];
			arr[min]=arr[i];
			arr[i]=temp;
		}

		//if after swapping the array is sorted, then break
		if(i+sort+2==n-1||i+sort==n-1)
		{
			break;
		}
	}
//	cout<<run;
//	return arr;
}

int main(void)
{

	//Declering variables
	int n,*arr,i;

	//Asking for No. of elements in array
	cout<<"Enter the no of elements in array:-\n";
	cin>>n;

	//Creating array of given size using malloc
	arr=(int*)malloc(sizeof(int)*n);

	//Taking input of elements of array
	cout<<"Enter the array\n";
	for(i=0;i<n;i++)
```

```
	{
		cin>>arr[i];
	}

	//Sorting the array
	//bubblesort(arr, n);
	selectionsort(arr, n);
	//quicksort(arr,0,n-1);

	//Displaying the final result
	cout<<"\nThe Sorted array is:- \n";
	for(i=0;i<n;i++)
	{
		cout<<arr[i]<<" ";
	}
	return 0;
}
```

Selection Sort:-

Code:-

```
for (i=0 ; i<n ; i++)
{
    min = i;

    for (j= i+1; j<n; j++)
    {
        if (arr[min] > arr[j])
        {
            min = j;
        }
    }
    if (min != i)
    {
        temp = arr[min];
        arr[min] = arr[i];
        arr[i] = temp;
    }
}
```

Time Analysis:-

pass 1 Traversing from i = 1 to n-1 → n-1

pass 2 Traversing from i = 2 to n-1 → n-2

⋮

pass(n-1) Traversing from i = n-1 to n-1 → 1

Total no of comparisons = (n-1) + (n-2) + ... 1

$$= \frac{n(n-1)}{2}$$

$$f(n) = 0.5n^2 - 0.5n - 00$$