LAB 08

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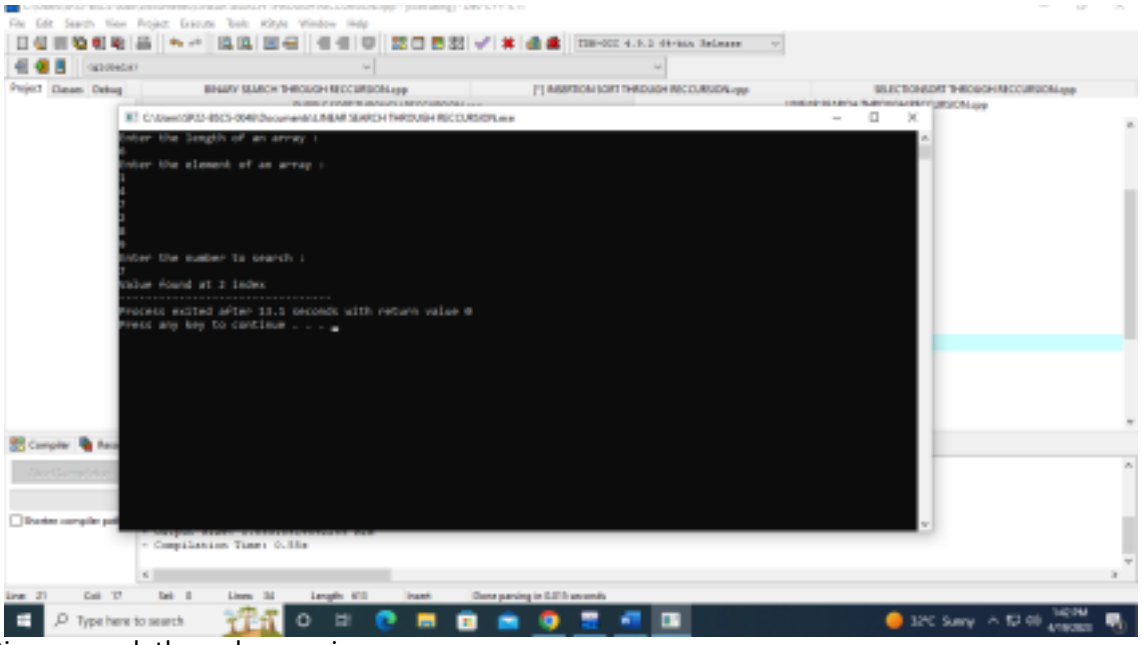
SP22-BSCS-0046
SECTION AM

1. Linear search through recursion.

SOURCE CODE:

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


void linearsearch(int arr[], int value, int length){
	if(length != 0){
		if(arr[length - 1] == value){
			cout<<"Value found at "<<length - 1<<" index";
		}
		else{
			linearsearch(arr,value,length - 1);
		}

	}
}

int main(){
	int length;
	int value;
	cout<<"Enter the length of an array : "<<endl;
	cin>>length;

	int arr[length];

	cout<<"Enter the element of an array : "<<endl;
	for(int i = 0; i < length; i++){
		cin>>arr[i];
	}
	cout<<"Enter the number to search : "<<endl;
	cin>>value;

	linearsearch(arr,value,length);
}
```

PICTURE:



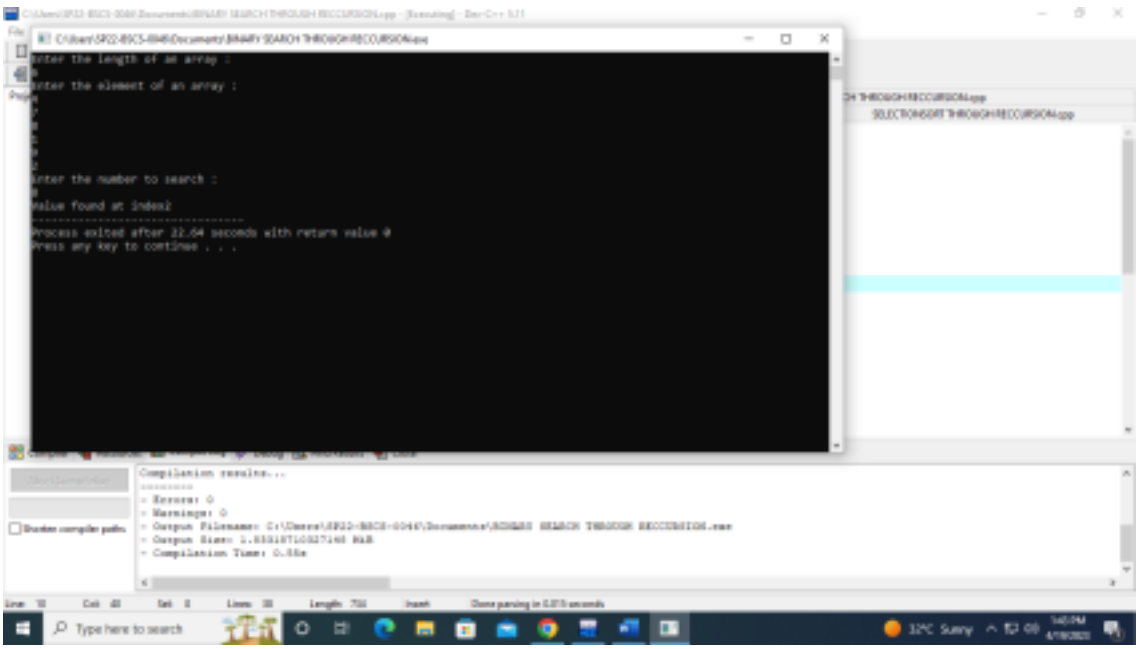
2. Binary search through recursion.

SOURCE CODE:

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


void binarysearch(int arr[],int value,int start,int end){

        if(start < end){
                int mid = (start+end)/2;
                if(arr[mid] == value){
                        cout<<"Value found at index"<<mid;
                }
                else if(arr[mid] > value){
                        binarysearch(arr,value,start,mid -1);
                }
                else if(arr[mid] < value){
                        binarysearch(arr, value,mid + 1,end);
                }
        }
}

int main(){
        int length;
        int value;
        cout<<"Enter the length of an array : "<<endl;
        cin>>length;

        int arr[length];

        cout<<"Enter the element of an array : "<<endl;
        for(int i = 0; i < length; i++){
```

```
            cin>>arr[i];
        }
        cout<<"Enter the number to search : "<<endl;
        cin>>value;

        binarysearch(arr,value,0,length - 1);

}
```

PICTURE:



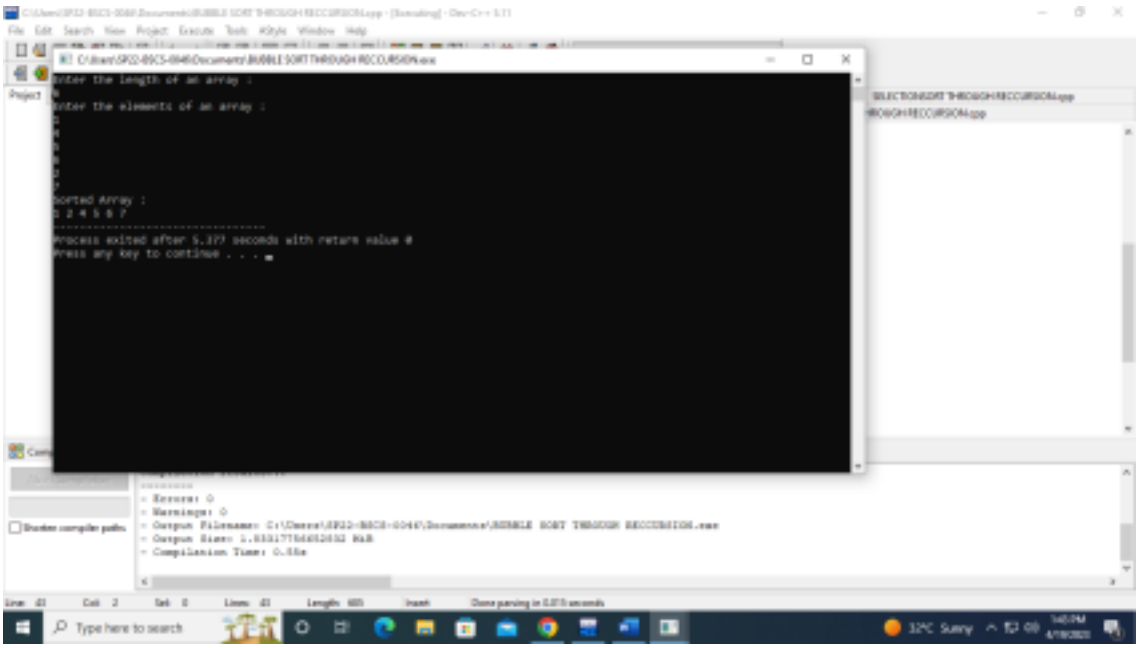
3. Bubble sort through recursion.

SOURCE CODE:

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


void bubblesort(int arr[],int length){
        if(length != 1){
                for(int i = 0; i < length-1; i++){
                        if(arr[i] > arr[i + 1]){
                                int temp = arr[i];
                                arr[i] = arr[i + 1];
                                arr[i + 1] = temp;
                        }

                }bubblesort(arr, length - 1);
        }
        else{
                return;
        }

}
```

```
int main(){
	int length;

	cout<<"Enter the length of an array :
	"<<endl; cin>>length;

	int arr[length];

	cout<<"Enter the elements of an array :
	"<<endl; for(int i = 0; i < length; i++){
		cin>>arr[i];
	}

	bubblesort(arr, length);

	cout<<"Sorted Array : "<<endl;
	for(int i = 0; i < length; i++){
		cout<<arr[i]<<" ";
	}

}
```

PICTURE:



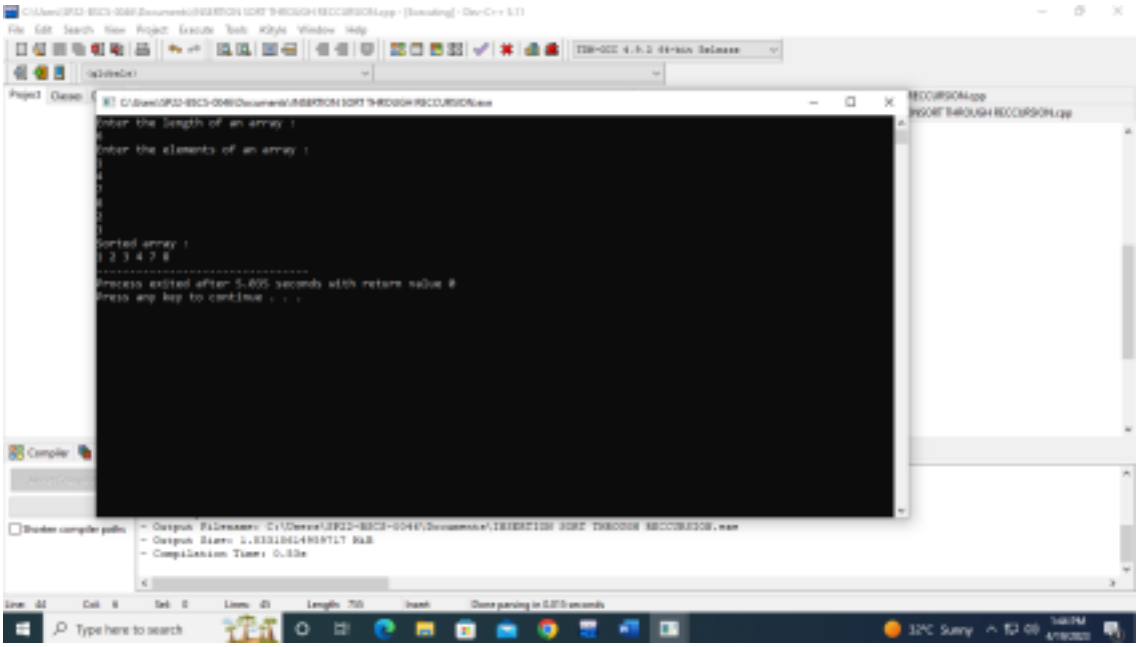
4. Insertion sort through recursion.

SOURCE CODE:

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


void insertionsort(int arr[],int length){

	if(length != 0){
		int key;
```

```
                int j;
                int i;
                insertionsort(arr,length - 1);
                for(int i = 1; i < length; i++){
                                key = arr[i];
                                j = i - 1;

                                while(j >= 0 && arr[j] > key){
                                        arr[j + 1] = arr[j];
                                        arr[j] = key;
                                        j = j - 1;
                                }
                                arr[j + 1] = key;
                        }
                }
}
int main(){
        int length;

        cout<<"Enter the length of an array : "<<endl;
        cin>>length;

        int arr[length];

        cout<<"Enter the elements of an array : "<<endl;
        for(int i = 0; i < length; i++){
                cin>>arr[i];
        }

        insertionsort(arr,length);
        cout<<"Sorted array : "<<endl;
        for(int i = 0; i < length; i++){
                cout<<arr[i]<<" ";
        }
}
```

PICTURE:



5. Selection sort through recursion.

SOURCE CODE:

```
#include<iostream>
using namespace std;
    void selectionsort(int arr[],int min,int
        length){ if(min != length){
            int i = min;
            for(int j = min + 1;j < length; j++){
                if(arr[i] > arr[j]){
                    i = j;
                }
            }
            int temp = arr[min];
            arr[min] = arr[i];
            arr[i] = temp;

            selectionsort(arr,min + 1,length);
        }
}


int main(){
        int length;

        cout<<"Enter the length of an array :
        "<<endl; cin>>length;

        int arr[length];

        cout<<"Enter the elements of an array :
        "<<endl; for(int i = 0; i < length; i++){
            cin>>arr[i];
```

```
        }

        selectionsort(arr,0,length);
        cout<<"Sorted array : "<<endl;
        for(int i = 0; i < length; i++){
                cout<<arr[i]<<" ";
        }
}
```

PICTURE: