Batch:A2

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Program

```c
#include<stdio.h>



int binarySearch(int arr[],int max, int min, int key){
   if(max<min) return -1;
   int mid=(max+min)/2;
   if(arr[mid]>key) return binarySearch(arr,mid-1,min,key);
   if(arr[mid]<key) return binarySearch(arr,max,mid+1,key);
   else return mid;
}



void countingSort(int *arr,int n){
   int output[n];

   int max=arr[0];
   for(int i=1;i<n;i++){
       if(arr[i]>max){
           max=arr[i];
       }
   }


   int count[max+1];
   for(int i=0;i<=max;i++){
       count[i]=0;
   }


   for(int i=0;i<n;i++){
       count[arr[i]]++;
   }
   for(int i=1;i<=max;i++){
       count[i]+=count[i-1];
   }
   for(int i=n-1;i>=0;i--){
       output[count[arr[i]]-1]=arr[i];
```

```
        count[arr[i]]--;
    }
    for(int i=0;i<n;i++){
        arr[i]=output[i];
    }

}




int main(){
    int n,i;
    printf("Enter size of Array: ");
    scanf("%d",&n);
    int arr[n];
    printf("Enter the array with space separation: ");
    for(i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    countingSort(arr,n);
    int find;
    printf("Enter the element you want to search: ");
    scanf("%d",&find);
    int x=binarySearch(arr,n-1,0,find);
    if(x!=-1){
        printf("Element exists!");
    }
    else{
        printf("Element Not Found");
    }

    return 1;

}
```

OUTPUT

```
● → d:\testing sudo gcc test.c
⊗ → d:\testing ./a.out
  Enter size of Array: 8
  Enter the array with space separation: 1 9 2 8 3 7 4 6
  Enter the element you want to search: 7
  Element exists!%
⊗ → d:\testing ./a.out
  Enter size of Array: ^[[A^[[B^C
⊗ → d:\testing ./a.out
  Enter size of Array: 8
  Enter the array with space separation: 1 9 2 8 3 7 4 6
  Enter the element you want to search: 10
  Element Not Found%
○ → d:\testing
```