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Program:

```
#include <stdio.h>

#include <stdlib.h>

void insertionSort(int arr[], int n);

void main()
{
	int arr[100], i, n, x, choice, flag = 0;
	printf("\t --- WELCOME TO IMPLEMENTATION OF BINARY SEARCH --- \n");
	printf("\n Enter the number of elements of the array [maximum size = 100] : ");
	scanf("%d", &n);
	printf("\n Enter %d elements of the array : \n", n);
	for (i = 0; i < n; i++)
	{
	scanf(" %d", &arr[i]);
	}
	insertionSort(arr, n);
	do
	{
	printf("\n\n !! -- Operations available -- !!");
	printf("\n 1. Display Sorted List \t 2. Search a particular value \t 3. Exit");
	printf("\n Please Enter your choice : ");
	scanf("%d", &choice);
	switch (choice)
	{
	case 1:
	{
	printf("\n\n The sorted array is : \n");
	for (i = 0; i < n; i++)
	{
		printf(" %d \t", arr[i]);
	}
```

```
break;
}
case 2:
{
printf("\n Enter the number to be searched : ");
scanf("%d", &x);
int beg = 0, end = n - 1, mid;
while (beg <= end)
{
        mid = (beg + end) / 2;
        if (arr[mid] == x)
        {
        printf("\n %d is present in the sorted array at index : %d", x, mid);
        flag = 1;
        break;
        }
        else if (arr[mid] > x)
        {
        end = mid - 1;
        }
        else
        {
        beg = mid + 1;
        }
}
if (beg > end || flag == 0)
{
        printf("\n %d does not exist int the array", x);
}
break;
}
case 3:
{
printf("\n Program Finished !! Thank You");
break;
}
default:
```

```
        {
        printf("\n Please enter a valid choice 1, 2, 3.");
        }
        }
        } while (choice != 3);

}

void insertionSort(int arr[], int n)
{
        int i, j, temp;
        for (i = 1; i < n; i++)
        {
        temp = arr[i];
        j = i - 1;
        while ((temp < arr[j]) && (j >= 0))
        {
        arr[j + 1] = arr[j];
        j--;
        }
```