

EXPERIMENT NO: 09

PROGRAM:

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 void insertionSort(int arr[], int n);
4 void main()
5 {
6     int arr[100],i,n,x,choice,flag=0;
7     printf("\n WELCOME TO THE IMPLEMENTATION OF BINARY SEARCH\n");
8     printf("\n Enter the number of elements of array (maximum size=100): ");
9     scanf("%d",&n);
10    printf("\n Enter elements of the array:");
11    for(i=0;i<n;i++)
12    {
13        scanf("%d",&arr[i]);
14    }
15    insertionSort(arr,n);
16    do{
17        printf("\n Operation available:\n ");
18        printf("\n 1)Display sorted list\n 2)Search a particular value\n 3)Exit\n ");
19        printf("\n Please enter your choice:\n");
20        scanf("%d",&choice);
21        switch(choice)
22        {
23            case 1:
24            {
25                printf("\nThe sorted array is : \n");
26                for (i = 0; i < n; i++)
27                {
28                    printf(" %d \t", arr[i]);
29                }
30                break;
31            }
32            case 2:
33            {
34                printf("\n Enter the number to be searched : ");
35                scanf("%d", &x);
36                int beg = 0, end = n - 1, mid;
37                while (beg <= end)
38                {
39                    mid = (beg + end) / 2;
40                    if (arr[mid] == x)
41                    {
42                        printf("\n %d is present in the sorted array at index : %d", x, mid);
43                        flag = 1;
44                        break;
```

```

45         }
46         else if (arr[mid] > x)
47         {
48             end = mid - 1;
49         }
50         else
51         {
52             beg = mid + 1;
53         }
54     }
55     if (beg > end || flag == 0)
56     {
57         printf("\n %d does not exist int the array", x);
58     }
59     break;
60 }
61 case 3:
62 {
63     printf("\n Program Finished \n ");
64     break;
65 }
66 default:
67 {
68     printf("\n Please enter a valid choice 1, 2, 3.");
69 }
70 }
71 } while (choice != 3);
72
73 }
74
75 void insertionSort(int arr[], int n)
76 {
77     int i, j, temp;
78     for (i = 1; i < n; i++)
79     {
80         temp = arr[i];
81         j = i - 1;
82         while ((temp < arr[j]) && (j >= 0))
83         {
84             arr[j + 1] = arr[j];
85             j--;
86         }
87         arr[j + 1] = temp;
88     }

```

OUTPUT:

```
adminit@adminit-HP-ProDesk-400-G7-Microtower-PC: ~  
WELCOME TO THE IMPLEMENTATION OF BINARY SEARCH  
Enter the number of elements of array (maximum size=100): 5  
Enter elements of the array:1  
2  
3  
8  
54  
Operation available:  
1)Display sorted list  
2)Search a particular value  
3)Exit  
Please enter your choice:  
1  
The sorted array is :  
1      2      3      8      54  
Operation available:  
1)Display sorted list  
2)Search a particular value  
3)Exit  
Please enter your choice:  
2  
Enter the number to be searched : 78  
78 does not exist int the array  
Operation available:  
1)Display sorted list  
2)Search a particular value  
3)Exit  
Please enter your choice:  
█
```

NAME: AWANI GOYAL

SY/A

ROLL NO: 31