Vaidehi M Godbole Roll no 14

Exp 9

Code:

```
#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--;
}
arr[j + 1] = temp;
}
```

Output:

```
dl416@itadmin:~$ gcc exp9.c dl416@itadmin:~$ ./a.out
          --- WELCOME TO IMPLEMENTATION OF BINARY SEARCH ---
 Enter the number of elements of the array [maximum size = 100] : 5
 Enter 5 elements of the array :
12 3 19 8 6
!! -- Operations available -- !!
1. Display Sorted List
Please Enter your choice : 1
                                     2. Search a particular value
                                                                             3. Exit
The sorted array is:
3 6 8
                             12
!! -- Operations available -- !!
1. Display Sorted List 2
                                     2. Search a particular value 3. Exit
 Please Enter your choice : 2
 Enter the number to be searched: 19
 19 is present in the sorted array at index : 4
!! -- Operations available -- !!
1. Display Sorted List 2
Please Enter your choice : 3
                                     2. Search a particular value
                                                                             3. Exit
dl416@itadmin:~$
```