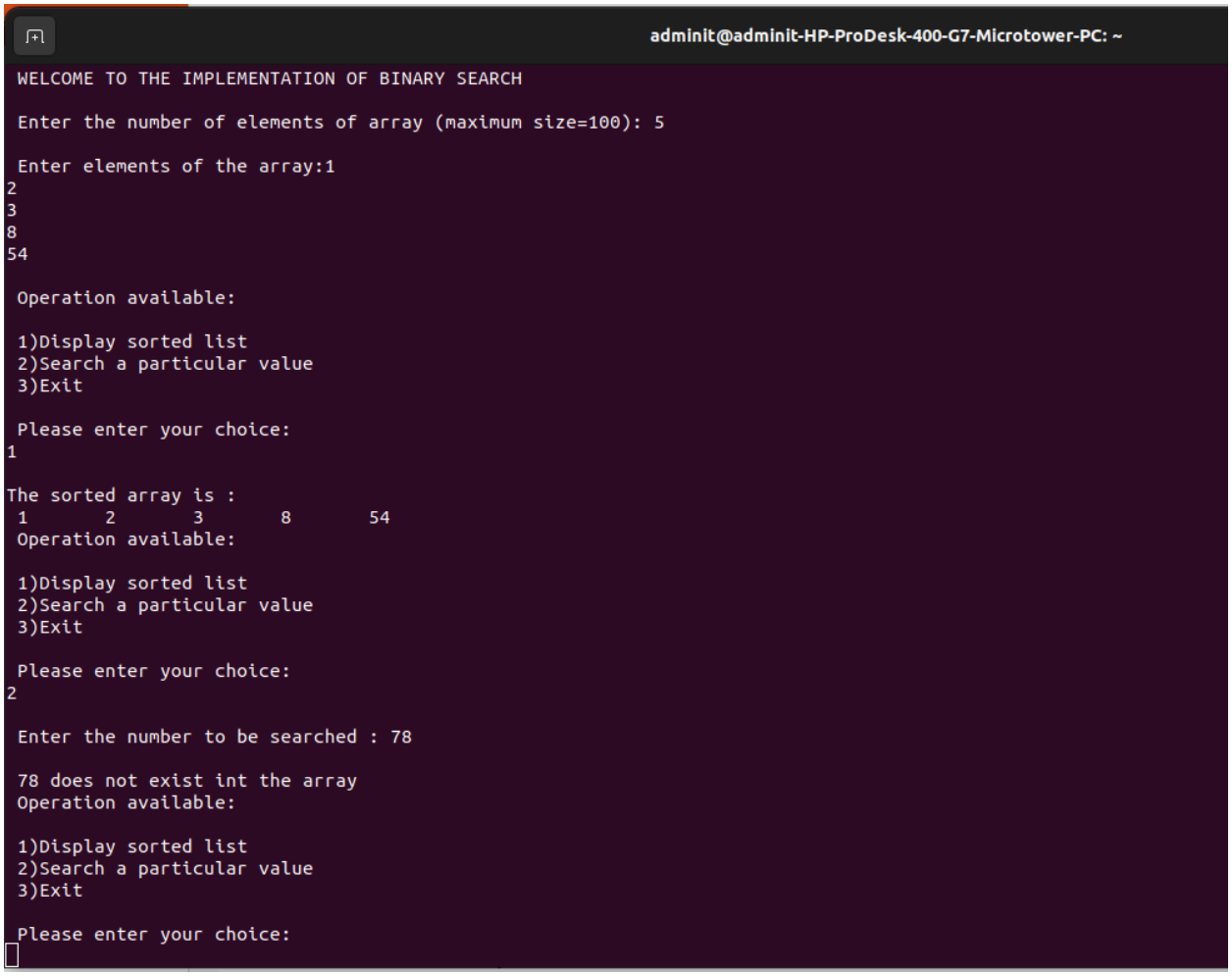
EXPERIMENT NO: 09

PROGRAM:

```c
#include<stdio.h>
#include<stdlib.h>
void insertionSort(int arr[], int n);
void main()
{
int arr[100],i,n,x,choice,flag=0;
printf("\n WELCOME TO THE IMPLEMENTATION OF BINARY SEARCH\n");
printf("\n Enter the number of elements of array (maximum size=100): ");
scanf("%d",&n);
printf("\n Enter elements of the array:");
for(i=0;i<n;i++)
{
scanf("%d",&arr[i]);
}
insertionSort(arr,n);
do{
printf("\n Operation available:\n ");
printf("\n 1)Display sorted list\n 2)Search a particular value\n 3)Exit\n ");
printf("\n Please enter your choice:\n");
scanf("%d",&choice);
switch(choice)
{
        case 1:
        {
            printf("\nThe 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;
```

```
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:



NAME: AWANI GOYAL
SY/A
ROLL NO: 31