EXPERIMENT NUMBER 09
DSA LAB

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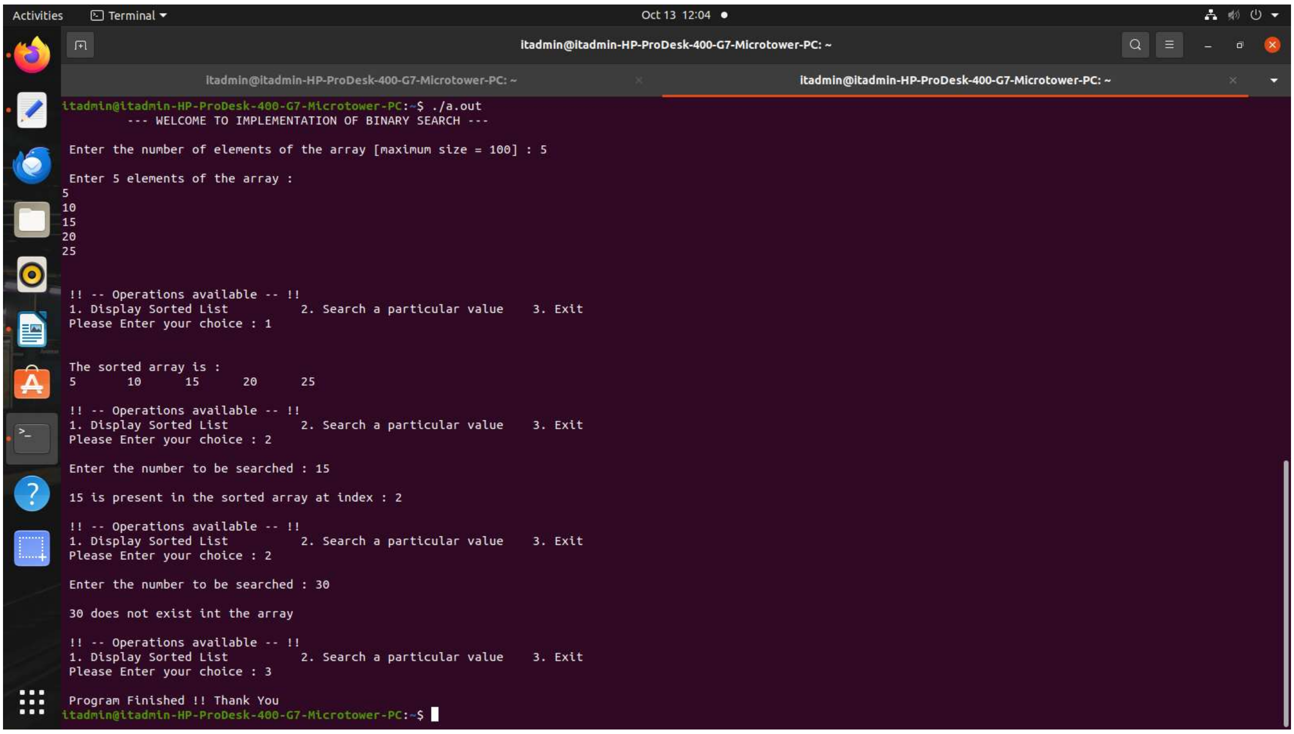
ROLL NO.:16
BATCH:S1,SY-IT

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);
    printf("\n");
}

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;
    }
}
```

SCREENSHOT:


Activities
Terminal
Oct 13 12:04
itadmin@itadmin-HP-ProDesk-400-G7-Microtower-PC: ~
itadmin@itadmin-HP-ProDesk-400-G7-Microtower-PC: ~
itadmin@itadmin-HP-ProDesk-400-G7-Microtower-PC: ~

```
itadmin@itadmin-HP-ProDesk-400-G7-Microtower-PC:~$ ./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 :
5
10
15
20
25



 !! -- Operations available -- !!
 1. Display Sorted List          2. Search a particular value    3. Exit
 Please Enter your choice : 1


 The sorted array is :
 5       10      15      20      25

 !! -- Operations available -- !!
 1. Display Sorted List          2. Search a particular value    3. Exit
 Please Enter your choice : 2

 Enter the number to be searched : 15

 15 is present in the sorted array at index : 2

 !! -- Operations available -- !!
 1. Display Sorted List          2. Search a particular value    3. Exit
 Please Enter your choice : 2

 Enter the number to be searched : 30

 30 does not exist int the array

 !! -- Operations available -- !!
 1. Display Sorted List          2. Search a particular value    3. Exit
 Please Enter your choice : 3

 Program Finished !! Thank You
itadmin@itadmin-HP-ProDesk-400-G7-Microtower-PC:~$ 
```