**Birla Institute of Technology & Science, Pilani, Hyderabad Campus**

**First Semester 2020-2021**
**Computer Programming [CS F111] Lab 9**

## Practice Programs:

**1. Write a C program to search an element using linear search.**

**Hint:** first read the count of elements/numbers followed by the individual numbers and the number to be searched.

**Code:**

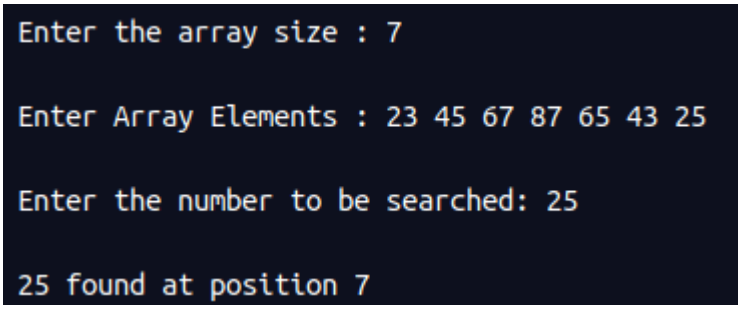
```c
#include<stdio.h>
int main()
{
    int arr[10], i, num, n, c=0, pos;

    printf("\nEnter the array size : ");
    scanf("%d",&n);
    printf("\nEnter Array Elements : ");
    for(i=0; i<n; i++)
        scanf("%d", &arr[i]);

    printf("\nEnter the number to be searched: ");
    scanf("%d",&num);
    for(i=0; i<n; i++)
        if(arr[i]==num)
        {
            c=1;
            pos=i+1;
            break;
        }

    if(c==0)
        printf("\nNumber not found..!!\n");
    else
        printf("\n%d found at position %d\n",num, pos);
    return 0;
}
```

**Sample Input/Output:**




**2. Write a C-Program to Sort numbers in ascending order using Bubble Sort.**

**Hint:** first read the count of numbers followed by the individual numbers to sort.

**Code:**

```c
#include<stdio.h>
int main()
{
    int arr[100], i=0, n, temp;
    printf("\nEnter the count of numbers: ");
    scanf("%d", &n);

    while(i<n) //read the numbers
    {
        scanf("%d", &arr[i]);
        i++;
    }

    for (i = 0; i < n-1; i++) //sort the numbers
    {
        for (int j = 0; j < n-i-1; j++)
        {
            if (arr[j] > arr[j+1])
            {
                temp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = temp;
            }
        }
    }
    printf("\nOUTPUT:\nElements in ascending order:\n");

    for (i=0; i < n; i++) //print the sorted numbers
        printf("%d ", arr[i]);
    printf("\n");
    return 0;
}
```

**Sample Input/Output:**

```
Enter the count of numbers: 6
6 4 3 5 1 3

OUTPUT:
Elements in ascending order:
1 3 3 4 5 6
```

**3. Write a C-Program to Search an element using binary search.**

**Hint:** first read all the elements (entered in the ascending order) followed by the element to search

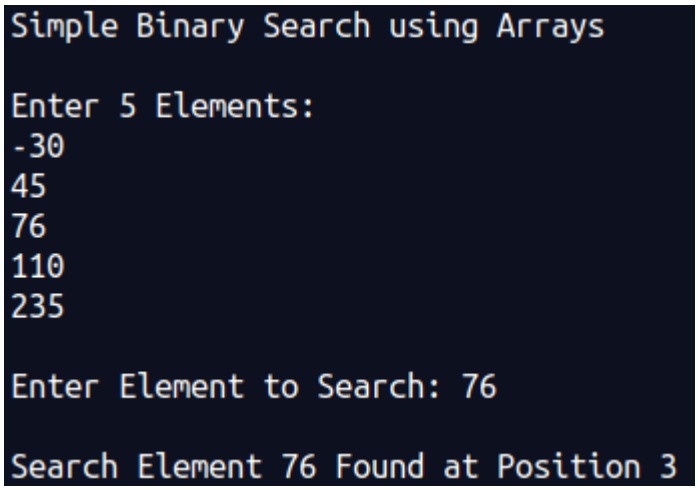
**Code:**

```c
#include<stdio.h>
#define MAX SIZE 5

void binary_search(int fn_arr[],int element) {
    int f = 0, r = MAX SIZE, mid;
    while (f <= r)
    {
        mid = (f+r)/2;
        if (fn_arr[mid] == element)
        {
            printf("\nSearch Element %d Found at Position
                %d\n", element, mid+1);
            break;
        }
        else if (fn_arr[mid] < element)
            f = mid + 1;
        else
            r = mid - 1;
    }
    if (f > r)
        printf("\nSearch Element %d NOT FOUND", element);
}

int main() {
    int arr_search[MAX_SIZE], i, element;
    printf("Simple Binary Search using Arrays\n");
    printf("\nEnter %d Elements: \n", MAX_SIZE);
    for (i = 0; i < MAX_SIZE; i++)
        scanf("%d", &arr search[i]);
    printf("\nEnter Element to Search: ");
    scanf("%d", &element);
    binary search(arr search, element);
}
```

**Sample Input/Output:**




## Exercise Problems:

1. Modify the practice program-1 to print how many times the search element has occurred among the given elements.
2. Modify the practice program-2 in such a way that all the **for** loops are replaced with equivalent **while** loops and **vice-versa**. Additionally, remove the **temp** variable (do not introduce any additional variable). That is, the swapping inside the **if** condition should be performed using the array elements only. Finally, your program should print the given numbers in ascending order.
3. Modify the practice program-3 to apply the binary search on the elements entered in a **descending** order.

*************ALL THE BEST*************

**NOTE: Upload the screenshots of the Practice programs and Exercise programs along with the displayed results into your corresponding Google Classroom.**

**PATH to Submit the Screenshots:**
**Google Classroom --> Classwork --> View Assignment --> Create/Upload**