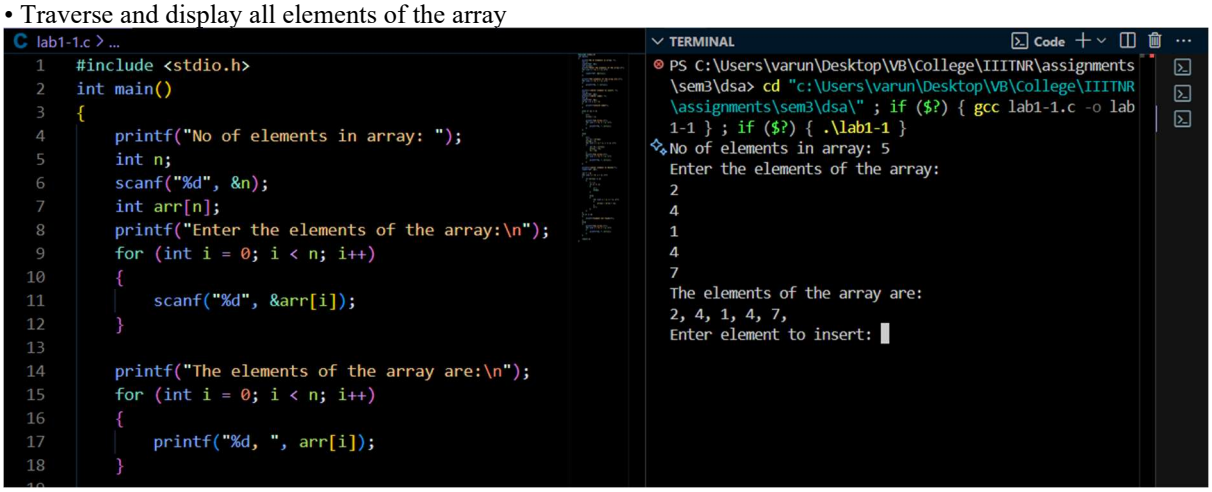
SECTION 1:

Write a program to perform the following operations on an array:

• Take user input to create the array

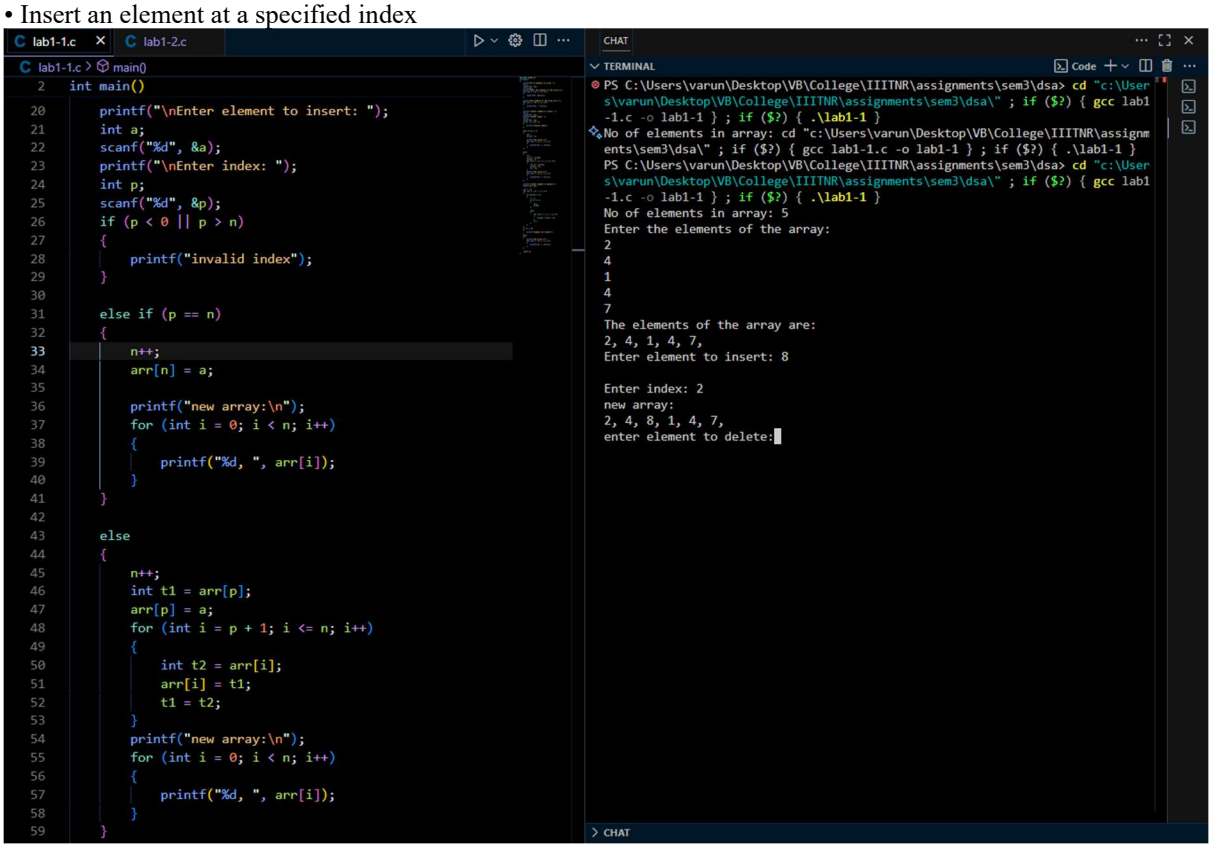
• Traverse and display all elements of the array



```c
#include <stdio.h>
int main()
{
    printf("No of elements in array: ");
    int n;
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }

    printf("The elements of the array are:\n");
    for (int i = 0; i < n; i++)
    {
        printf("%d, ", arr[i]);
    }
```

```
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
No of elements in array: 5
Enter the elements of the array:
2
4
1
4
7
The elements of the array are:
2, 4, 1, 4, 7,
Enter element to insert:
```

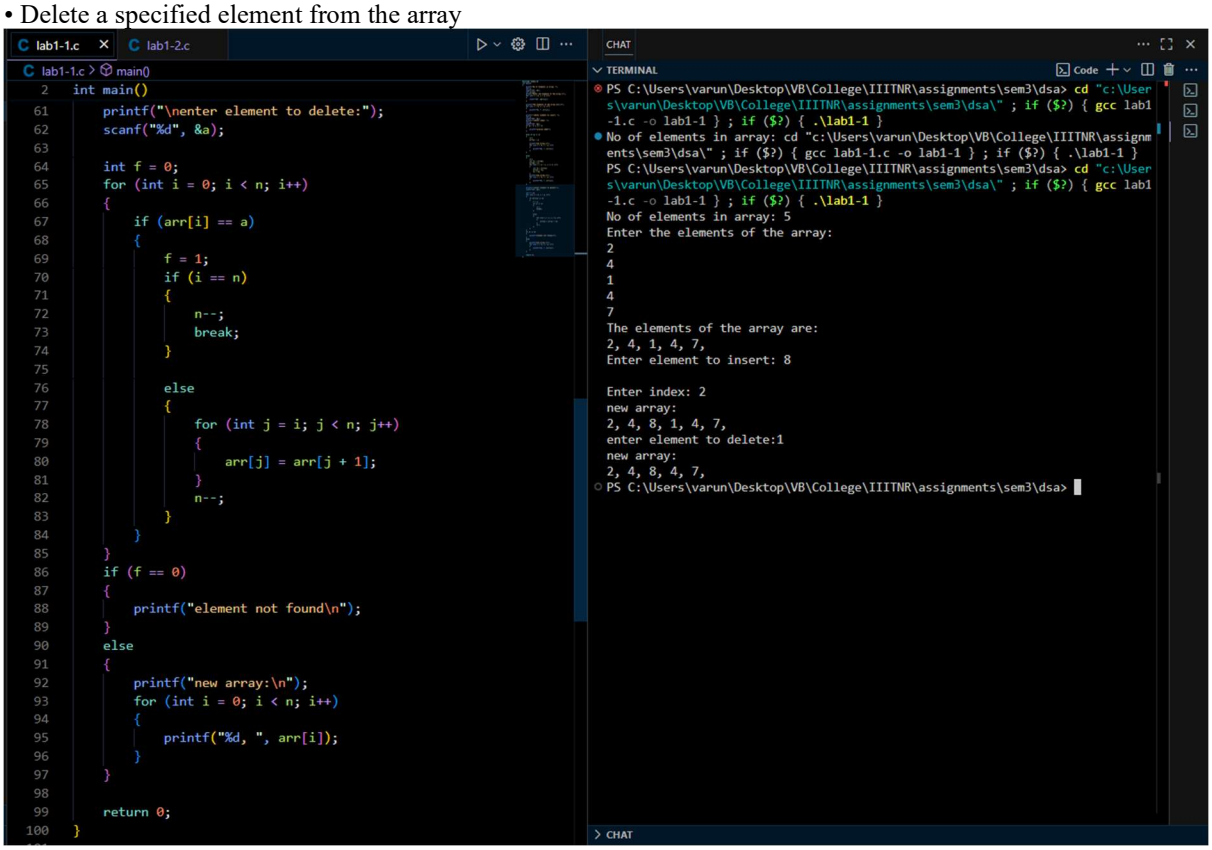
• Insert an element at a specified index



```c
int main()
{
    printf("\nEnter element to insert: ");
    int a;
    scanf("%d", &a);
    printf("\nEnter index: ");
    int p;
    scanf("%d", &p);
    if (p < 0 || p > n)
    {
        printf("invalid index");
    }

    else if (p == n)
    {
        n++;
        arr[n] = a;

        printf("new array:\n");
        for (int i = 0; i < n; i++)
        {
            printf("%d, ", arr[i]);
        }
    }

    else
    {
        n++;
        int t1 = arr[p];
        arr[p] = a;
        for (int i = p + 1; i <= n; i++)
        {
            int t2 = arr[i];
            arr[i] = t1;
            t1 = t2;
        }
        printf("new array:\n");
        for (int i = 0; i < n; i++)
        {
            printf("%d, ", arr[i]);
        }
    }
```

```
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
No of elements in array: cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
No of elements in array: 5
Enter the elements of the array:
2
4
1
4
7
The elements of the array are:
2, 4, 1, 4, 7,
Enter element to insert: 8

Enter index: 2
new array:
2, 4, 8, 1, 4, 7,
enter element to delete:
```

• Delete a specified element from the array

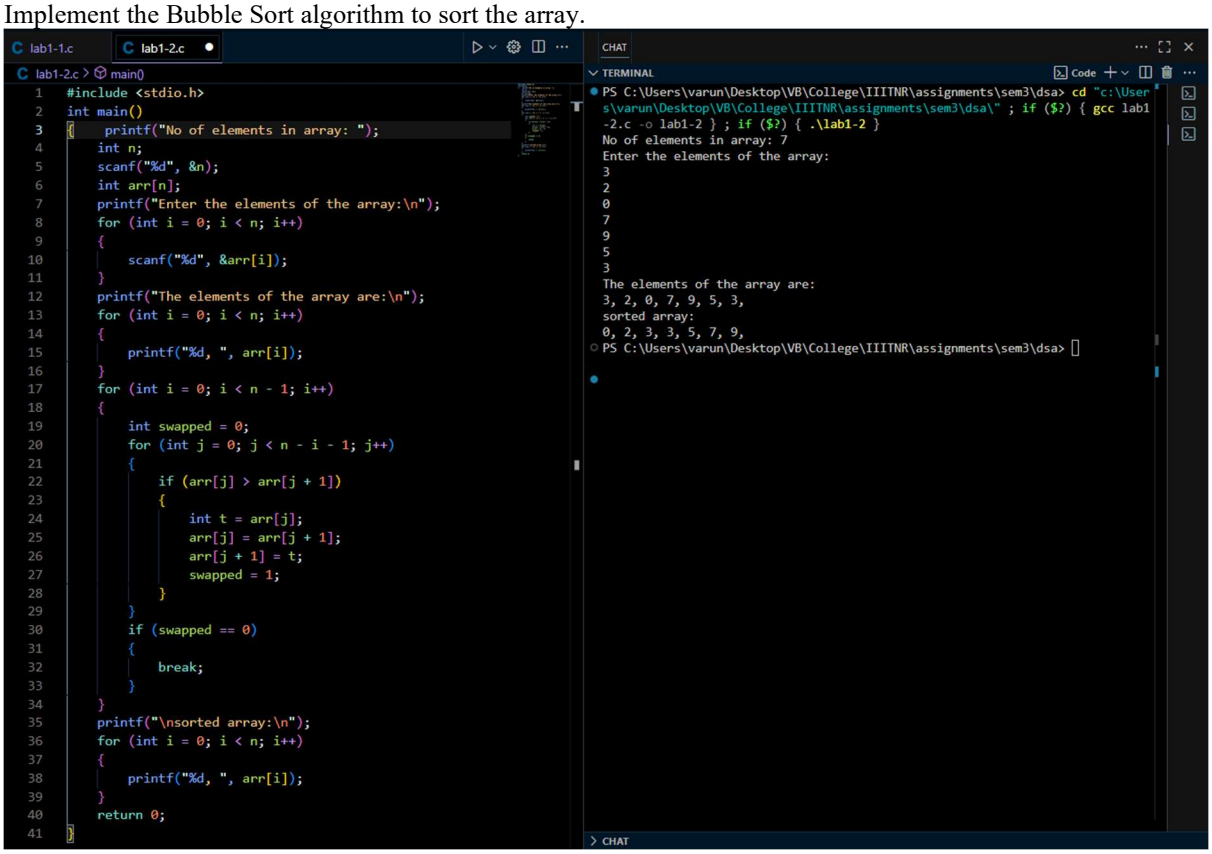


```
lab1-1.c
lab1-2.c
lab1-1.c > main()
int main()
    printf("\nenter element to delete:");
    scanf("%d", &a);

    int f = 0;
    for (int i = 0; i < n; i++)
    {
        if (arr[i] == a)
        {
            f = 1;
            if (i == n)
            {
                n--;
                break;
            }

            else
            {
                for (int j = i; j < n; j++)
                {
                    arr[j] = arr[j + 1];
                }
                n--;
            }
        }
    }
    if (f == 0)
    {
        printf("element not found\n");
    }
    else
    {
        printf("new array:\n");
        for (int i = 0; i < n; i++)
        {
            printf("%d, ", arr[i]);
        }
    }

    return 0;
}
```

```
CHAT
TERMINAL
Code
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
No of elements in array: cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-1.c -o lab1-1 } ; if ($?) { .\lab1-1 }
No of elements in array: 5
Enter the elements of the array:
2
4
1
4
7
The elements of the array are:
2, 4, 1, 4, 7,
Enter element to insert: 8

Enter index: 2
new array:
2, 4, 8, 1, 4, 7,
enter element to delete:1
new array:
2, 4, 8, 4, 7,
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa>
CHAT
```

SECTION 2:

Implement the Bubble Sort algorithm to sort the array.



```c
#include <stdio.h>
int main()
{    printf("No of elements in array: ");
    int n;
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    printf("The elements of the array are:\n");
    for (int i = 0; i < n; i++)
    {
        printf("%d, ", arr[i]);
    }
    for (int i = 0; i < n - 1; i++)
    {
        int swapped = 0;
        for (int j = 0; j < n - i - 1; j++)
        {
            if (arr[j] > arr[j + 1])
            {
                int t = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = t;
                swapped = 1;
            }
        }
        if (swapped == 0)
        {
            break;
        }
    }
    printf("\nsorted array:\n");
    for (int i = 0; i < n; i++)
    {
        printf("%d, ", arr[i]);
    }
    return 0;
}
```

```
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa> cd "c:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa\" ; if ($?) { gcc lab1-2.c -o lab1-2 } ; if ($?) { .\lab1-2 }
No of elements in array: 7
Enter the elements of the array:
3
2
0
7
9
5
3
The elements of the array are:
3, 2, 0, 7, 9, 5, 3,
sorted array:
0, 2, 3, 3, 5, 7, 9,
PS C:\Users\varun\Desktop\VB\College\IIITNR\assignments\sem3\dsa>
```