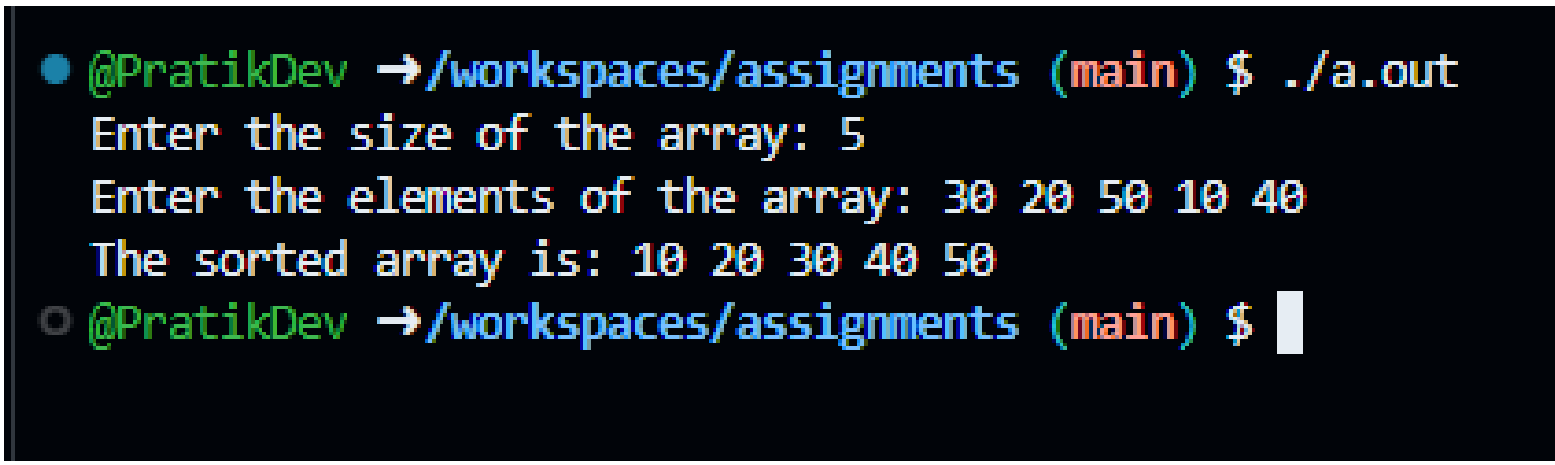
File: ./binary-search.c

```
#include<stdio.h>

void main(){
    int arr[10], i, n, key, flag=0, low, high, mid;

    printf("Enter the number of elements: ");
    scanf("%d", &n);

    printf("Enter the elements: ");
    for(i=0; i<n; i++){
        scanf("%d", &arr[i]);
    }

    printf("Enter the element to be searched: ");
    scanf("%d", &key);

    low = 0;
    high = n-1;

    while(low <= high){
        mid = (low + high)/2;

        if(arr[mid] == key){
            flag = 1;
            break;
        }

        else if(arr[mid] < key){
            low = mid + 1;
        }

        else{
            high = mid - 1;
        }
    }

    if(flag == 1){
        printf("The element is present at index %d\n", mid);
        return;
    }

    printf("The element is not present in the array\n");
}
```

```
@PratikDev ➜/workspaces/assignments (main) $ gcc binary-search.c
@PratikDev ➜/workspaces/assignments (main) $ ./a.out
Enter the number of elements: 10
Enter the elements: 10 20 30 40 50 60 70 80 90 100
Enter the element to be searched: 40
The element is present at index 3
@PratikDev ➜/workspaces/assignments (main) $
```

File: ./insertion-sort.c

```
#include<stdio.h>

void main(){
    int n, i, j, temp;

    printf("Enter the size of the array: ");
    scanf("%d", &n);

    int arr[n];

    printf("Enter the elements of the array: ");
    for(i = 0; i < n; i++){
        scanf("%d", &arr[i]);
    }

    for(i = 1; i < n; i++){
        temp = arr[i];
        j = i - 1;

        while(j >= 0 && arr[j] > temp){
            arr[j + 1] = arr[j];
            j--;
        }

        arr[j + 1] = temp;
    }

    printf("The sorted array is: ");
    for(i = 0; i < n; i++)
        printf("%d ", arr[i]);

    printf("\n");
}
```



File: ./swapping.c

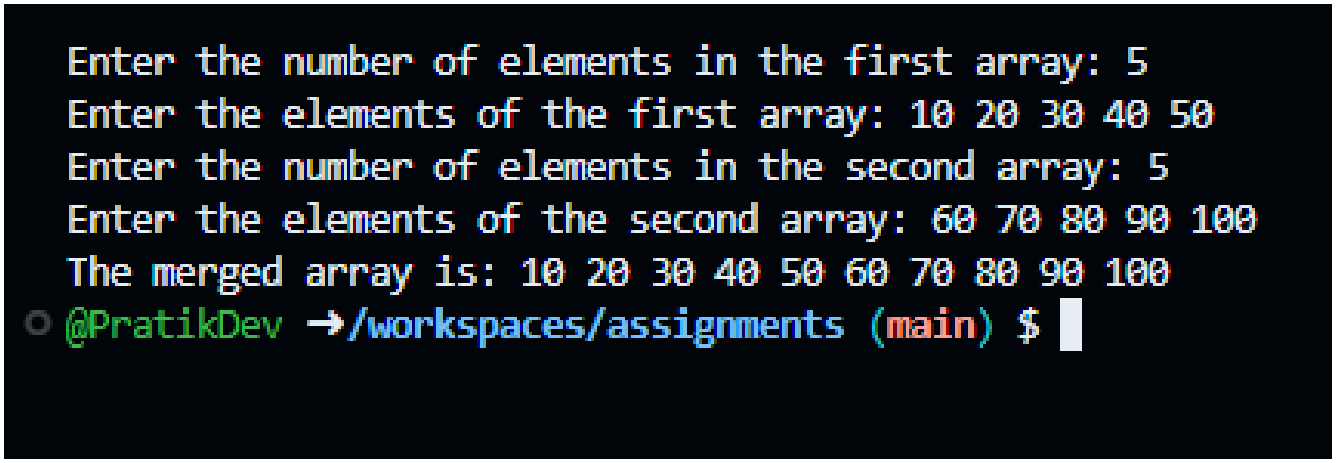
```
#include<stdio.h>

void main(){
    int arr[10], i, j, temp, n;

    printf("Enter the number of elements: ");
    scanf("%d", &n);

    printf("Enter the elements: ");
    for(i=0; i<n; i++){
        scanf("%d", &arr[i]);
    }

    printf("Enter the indices of the elements to be swapped: ");
    scanf("%d %d", &i, &j);

    arr[i] = arr[i] ^ arr[j];
    arr[j] = arr[i] ^ arr[j];
    arr[i] = arr[i] ^ arr[j];

    printf("The swapped array is: ");
    for(i=0; i<n; i++){
        printf("%d ", arr[i]);
    }

    printf("\n");
}
```

```
@PratikDev ➜/workspaces/assignments (main) $ ./a.out
Enter the number of elements: 5
Enter the elements: 20 30 40 50 60
Enter the indices of the elements to be swapped: 1 3
The swapped array is: 20 50 40 30 60
@PratikDev ➜/workspaces/assignments (main) $
```

File: ./merge.c

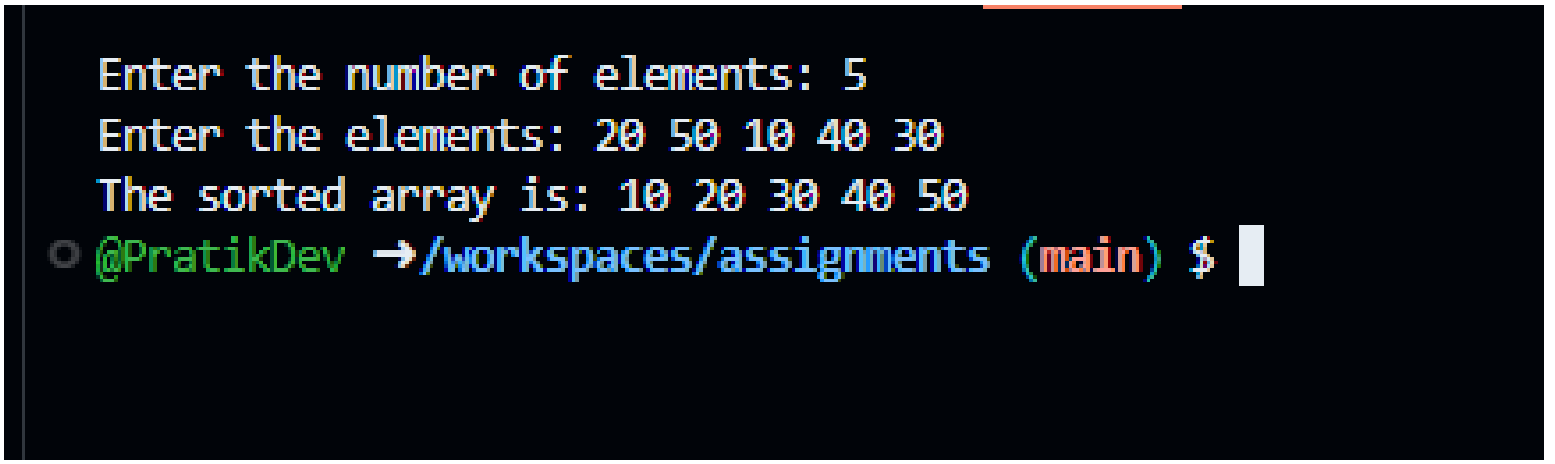
```
#include<stdio.h>

void main(){

    int arr1[100], arr2[100], arr3[200], n1, n2, i, j, k;

    printf("Enter the number of elements in the first array: ");
    scanf("%d", &n1);

    printf("Enter the elements of the first array: ");
    for(i=0; i<n1; i++){
        scanf("%d", &arr1[i]);
    }

    printf("Enter the number of elements in the second array: ");
    scanf("%d", &n2);

    printf("Enter the elements of the second array: ");
    for(i=0; i<n2; i++){
        scanf("%d", &arr2[i]);
    }

    i = 0;
    j = 0;
    k = 0;

    while(i<n1 && j<n2){
        if(arr1[i] < arr2[j]){
            arr3[k] = arr1[i];
            i++;
            k++;
        }

        else{
            arr3[k] = arr2[j];
            j++;
            k++;
        }
    }

    while(i<n1){
        arr3[k] = arr1[i];
        i++;
        k++;
    }

    while(j<n2){
        arr3[k] = arr2[j];
        j++;
        k++;
    }
```

```
    printf("The merged array is: ");
    for(i=0; i<n1+n2; i++){
        printf("%d ", arr3[i]);
    }

    printf("\n");
}
```



File: ./selection-sort.c

```
#include<stdio.h>

void main(){
    int arr[100], n, i, j, temp, min, min_index;

    printf("Enter the number of elements: ");
    scanf("%d", &n);

    printf("Enter the elements: ");
    for(i=0; i<n; i++){
        scanf("%d", &arr[i]);
    }

    for(i=0; i<n-1; i++){
        min = arr[i];
        min_index = i;

        for(j=i+1; j<n; j++){
            if(arr[j] < min){
                min = arr[j];
                min_index = j;
            }
        }

        temp = arr[i];
        arr[i] = arr[min_index];
        arr[min_index] = temp;
    }

    printf("The sorted array is: ");
    for(i=0; i<n; i++){
        printf("%d ", arr[i]);
    }

    printf("\n");
}
```



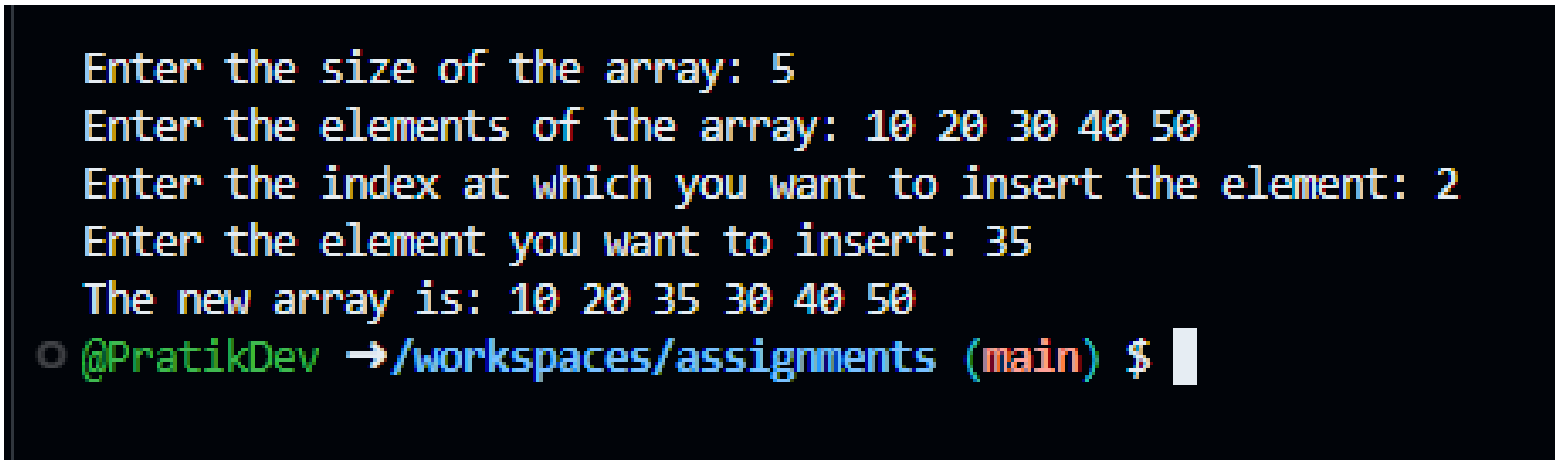
File: ./interpolation.c

```
#include<stdio.h>

void main(){
    int n, i, key, low, high, mid, flag = 0;

    printf("Enter the size of the array: ");
    scanf("%d", &n);

    int arr[n];

    printf("Enter the elements of the array: ");
    for(i = 0; i < n; i++){
        scanf("%d", &arr[i]);
    }

    printf("Enter the element to be searched: ");
    scanf("%d", &key);

    low = 0;
    high = n - 1;

    while(low <= high){
        mid = low + (((key - arr[low]) * (high - low)) / (arr[high] - arr[low]));

        if(arr[mid] == key){
            flag = 1;
            break;
        }

        else if(arr[mid] < key){
            low = mid + 1;
        }

        else{
            high = mid - 1;
        }
    }

    if(flag == 1){
        printf("Element found at index %d\n", mid);
        return;
    }

    printf("Element not found\n");
}
```

```
@PratikDev →/workspaces/assignments (main) $ rm a.out && gcc i
Enter the size of the array: 5
Enter the elements of the array: 10 20 30 40 50
Enter the element to be searched: 20
Element found at index 1
@PratikDev →/workspaces/assignments (main) $
```

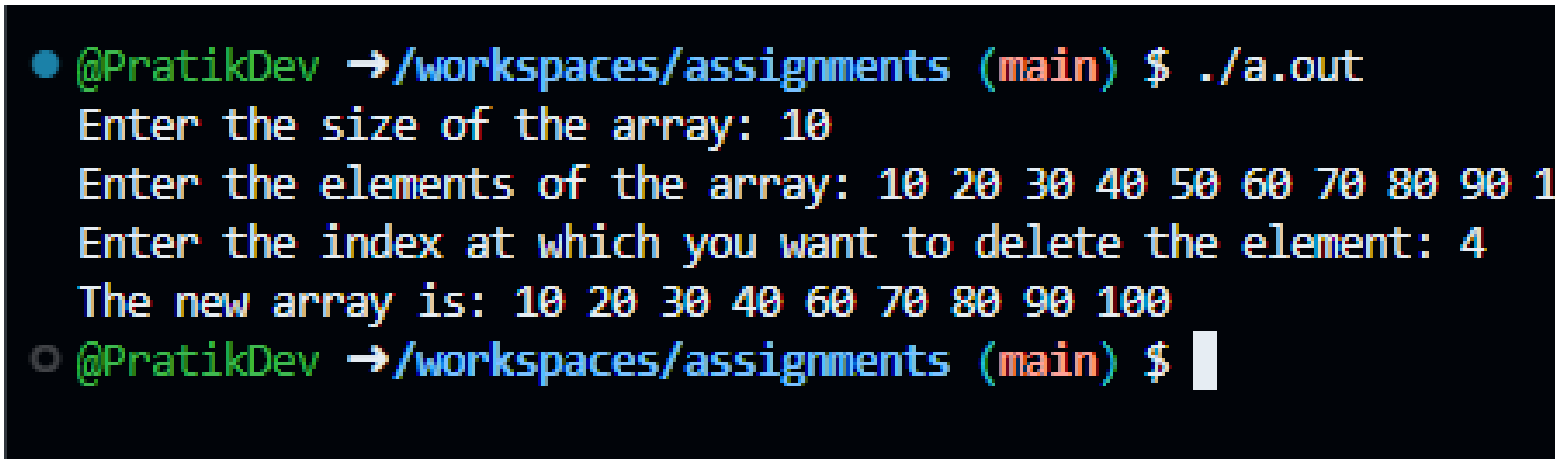
File: ./insertion.c

```
#include<stdio.h>

void main()
{
    int arr[100], size, index, element;

    printf("Enter the size of the array: ");
    scanf("%d", &size);

    printf("Enter the elements of the array: ");
    for(int i=0; i<size; i++)
    {
        scanf("%d", &arr[i]);
    }

    printf("Enter the index at which you want to insert the element: ");
    scanf("%d", &index);

    printf("Enter the element you want to insert: ");
    scanf("%d", &element);

    for(int i=size-1; i>=index; i--)
    {
        arr[i+1] = arr[i];
    }
    arr[index] = element;
    size++;

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

    printf("\n");
}
```



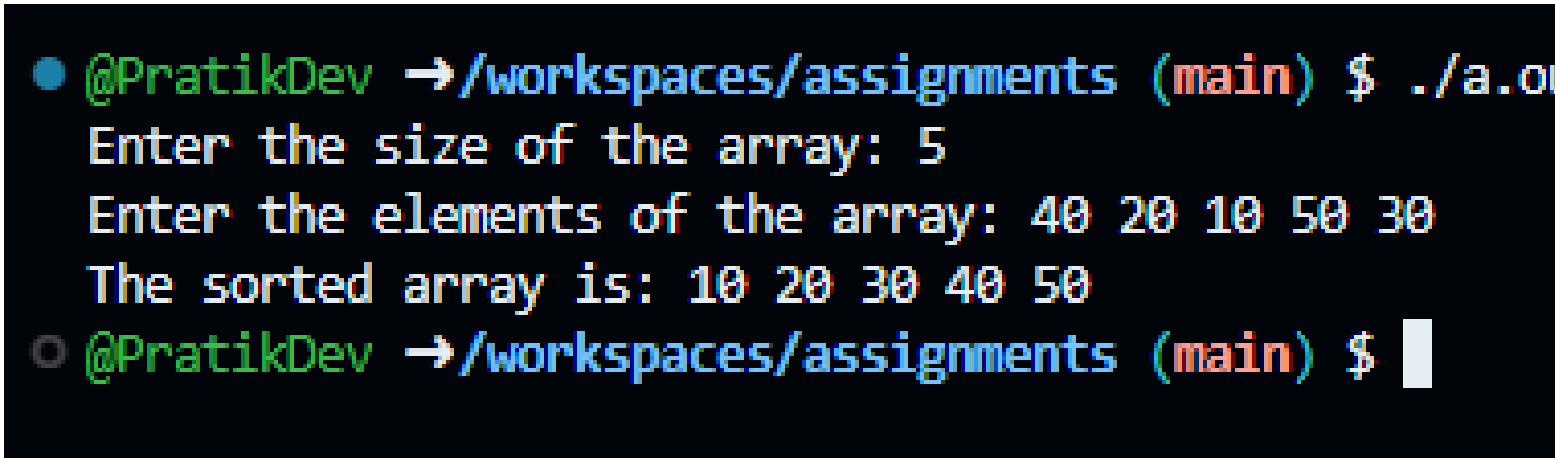
File: ./deletion.c

```
#include<stdio.h>

void main(){
    int arr[100], size, index;

    printf("Enter the size of the array: ");
    scanf("%d", &size);

    printf("Enter the elements of the array: ");
    for(int i=0; i<size; i++)
    {
        scanf("%d", &arr[i]);
    }

    printf("Enter the index at which you want to delete the element: ");
    scanf("%d", &index);

    for(int i=index; i<size-1; i++)
    {
        arr[i] = arr[i+1];
    }
    size--;

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

    printf("\n");
}
```



File: ./bubble-sort.c

```
#include<stdio.h>

void main(){
    int n, i, j, temp;

    printf("Enter the size of the array: ");
    scanf("%d", &n);

    int arr[n];

    printf("Enter the elements of the array: ");
    for(i = 0; i < n; i++){
        scanf("%d", &arr[i]);
    }

    for(i = 0; i < n - 1; i++){
        for(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("The sorted array is: ");
    for(i = 0; i < n; i++)
        printf("%d ", arr[i]);

    printf("\n");
}
```



File: ./linear-search.c

```
#include<stdio.h>

void main(){
    int arr[10], i, n, key, flag=0;

    printf("Enter the number of elements: ");
    scanf("%d", &n);

    printf("Enter the elements: ");
    for(i=0; i<n; i++){
        scanf("%d", &arr[i]);
    }

    printf("Enter the element to be searched: ");
    scanf("%d", &key);

    for(i=0; i<n; i++){
        if(arr[i] == key){
            flag = 1;
            break;
        }
    }

    if(flag == 1){
        printf("The element is present at index %d\n", i);
        return;
    }

    printf("The element is not present in the array\n");
}
```