

1.main.c

```
#include <stdio.h>
```

```
#include "header.h"
```

```
int main(){
```

```
    array a;
```

```
    int key, pos;
```

```
    init(&a, 5);
```

```
    append(&a, 5);
```

```
    append(&a, 8);
```

```
    append(&a, 9);
```

```
    append(&a, 2);
```

```
    append(&a, 3);
```

```
    printf("Original array: \n");
```

```
    print_array(&a);
```

```
    printf("Enter key to search (Linear Search): ");
```

```
    scanf("%d", &key);
```

```
    pos = linearSearch(&a, key);
```

```
    if (pos != -1) printf("Key found at index %d\n", pos);
```

```
    else printf("Key not found\n");
```

```
    return 0;
```

```
}
```

2.header.h

```
typedef struct{
```

```
    int *A;
```

```
    int size;
```

```
    int len;
```

```
}array;
```

```
void init(array *arr, int size);
```

```
void append(array *arr, int d);
```

```
int linearSearch(array *a, int key);
```

```
void print_array(array *arr);
```

3.logic.c

```
#include <stdio.h>
```

```
#include <stdlib.h>
```

```
#include "header.h"
```

```
void init(array *arr, int size){
```

```
    arr -> A = (int *)malloc(sizeof(int) * size);
```

```
    arr -> size = size;
```

```
    arr -> len = 0;
```

```
}
```

```
void append(array *arr, int d){
```

```
    if(arr -> len < arr -> size){
```

```
        arr -> A[arr -> len++] = d;
```

```
    }
```

```
}
```

```
int linearSearch(array *a, int key) {
```

```
    int i;
```

```
    for (i = 0; i < a -> len; i++) {
```

```
        if (key == a -> A[i]) {
```

```
            return i;
```

```
        }
```

```
    }
```

```
    return -1;
```

```
}
```

```
void print_array(array *arr) {
```

```
    for (int i = 0; i < arr->len; i++) {
```

```
        printf("%d ", arr->A[i]);
```

```
    }
```

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

```
}
```

Output:

```
PS D:\COEP\DSA\Serious\Assignments\Assignment7\1.LinearSearch> gcc -Wall main.c logic.c
PS D:\COEP\DSA\Serious\Assignments\Assignment7\1.LinearSearch> ./a
Original array:
5 8 9 2 3
Enter key to search (Linear Search): 2
Key found at index 3
PS D:\COEP\DSA\Serious\Assignments\Assignment7\1.LinearSearch> |
```