Implement a List using Array and develop functions to perform insertion, deletion and linear search operations.

#include <stdio.h>

#define MAX\_SIZE 100

struct List {

int array[MAX\_SIZE];

int length;

};

void initList(struct List\* list) {

list->length = 0;

}

void printList(struct List\* list) {

int i;

printf("[");

for (i = 0; i < list->length; i++) {

printf("%d", list->array[i]);

if (i < list->length - 1) {

printf(", ");

}

}

printf("]\n");

}

int linearSearch(struct List\* list, int value) {

int i;

for (i = 0; i < list->length; i++) {

if (list->array[i] == value) {

return i;

}

}

return -1;

}

void insert(struct List\* list, int index, int value) {

if (list->length == MAX\_SIZE) {

printf("Error: List is full\n");

return;

}

if (index < 0 || index > list->length) {

printf("Error: Invalid index\n");

return;

}

int i;

for (i = list->length - 1; i >= index; i--) {

list->array[i + 1] = list->array[i];

}

list->array[index] = value;

list->length++;

}

void delete(struct List\* list, int index) {

if (index < 0 || index >= list->length) {

printf("Error: Invalid index\n");

return;

}

int i;

for (i = index; i < list->length - 1; i++) {

list->array[i] = list->array[i + 1];

}

list->length--;

}

int main() {

struct List list;

initList(&list);

insert(&list, 0, 1);

insert(&list, 1, 3);

insert(&list, 1, 2);

printList(&list);

delete(&list, 1);

printList(&list);

int index = linearSearch(&list, 3);

if (index != -1) {

printf("Found 3 at index %d\n", index);

} else {

printf("3 not found in list\n");

}

return 0;

}

