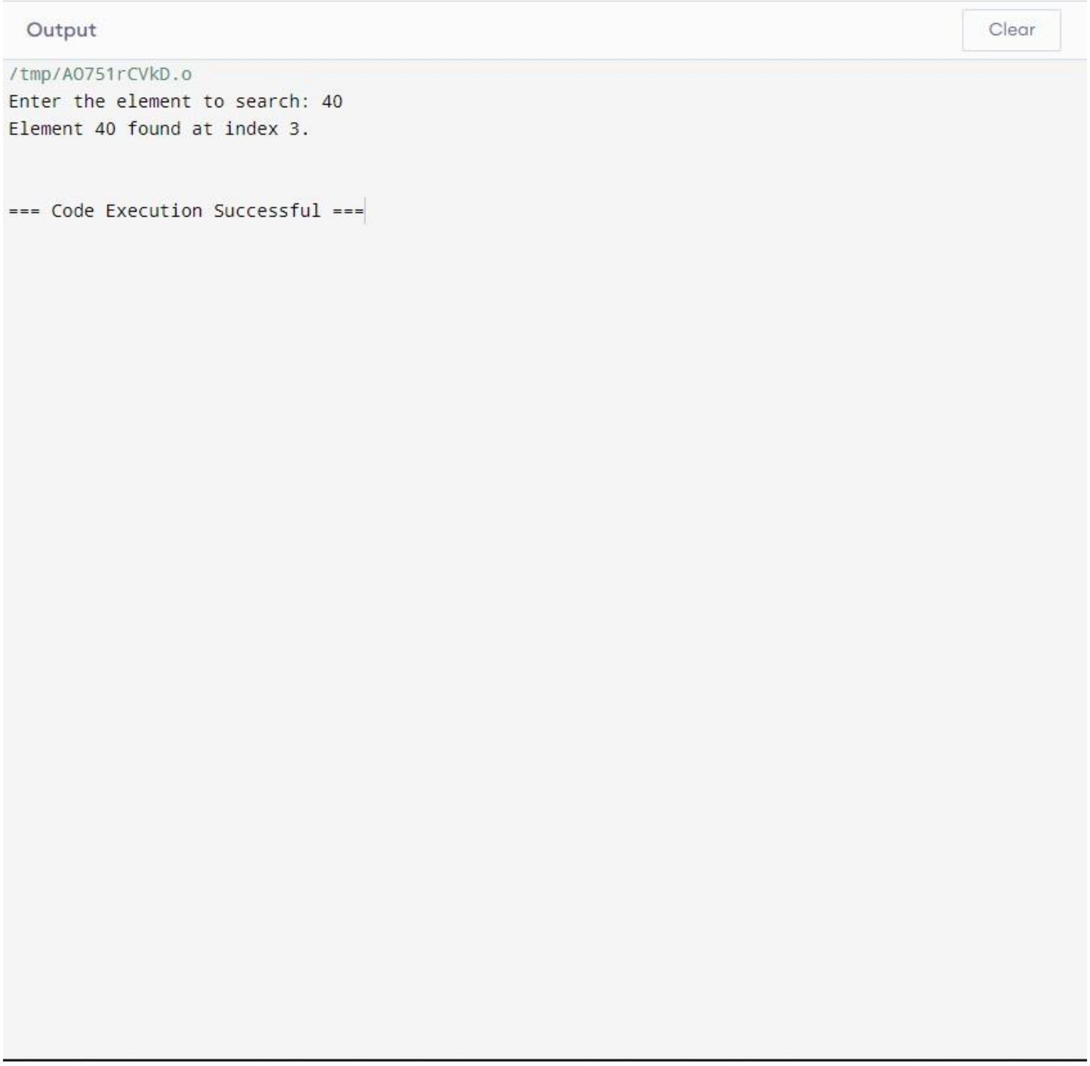
Write a c program to find elements using array CODE:

```
#include <stdio.h>
int linearSearch(int arr[], int size, int target) {
for (int i = 0; i < size; i++) {        if (arr[i] ==
target) {            return i;
        }
    }
    return -1;
}
int main() {
    int arr[] = {10, 20, 30, 40, 50};     int
size = sizeof(arr) / sizeof(arr[0]);     int
target;

    printf("Enter the element to search: ");
scanf("%d", &target);

    int result = linearSearch(arr, size, target);

    if (result != -1) {
        printf("Element %d found at index %d.\n", target, result);
    } else {
        printf("Element %d not found in the array.\n", target);
    }

    return 0;
}
```

OUTPUT:



```
/tmp/A0751rCVkD.o
Enter the element to search: 40
Element 40 found at index 3.


=== Code Execution Successful ===
```

TIME COMPLEXITY:

•Time Complexity**:** O(n)- (worst and average case)
• Best Case: O(1)- (if the target is the first element)

Write a c program to find element using linklist

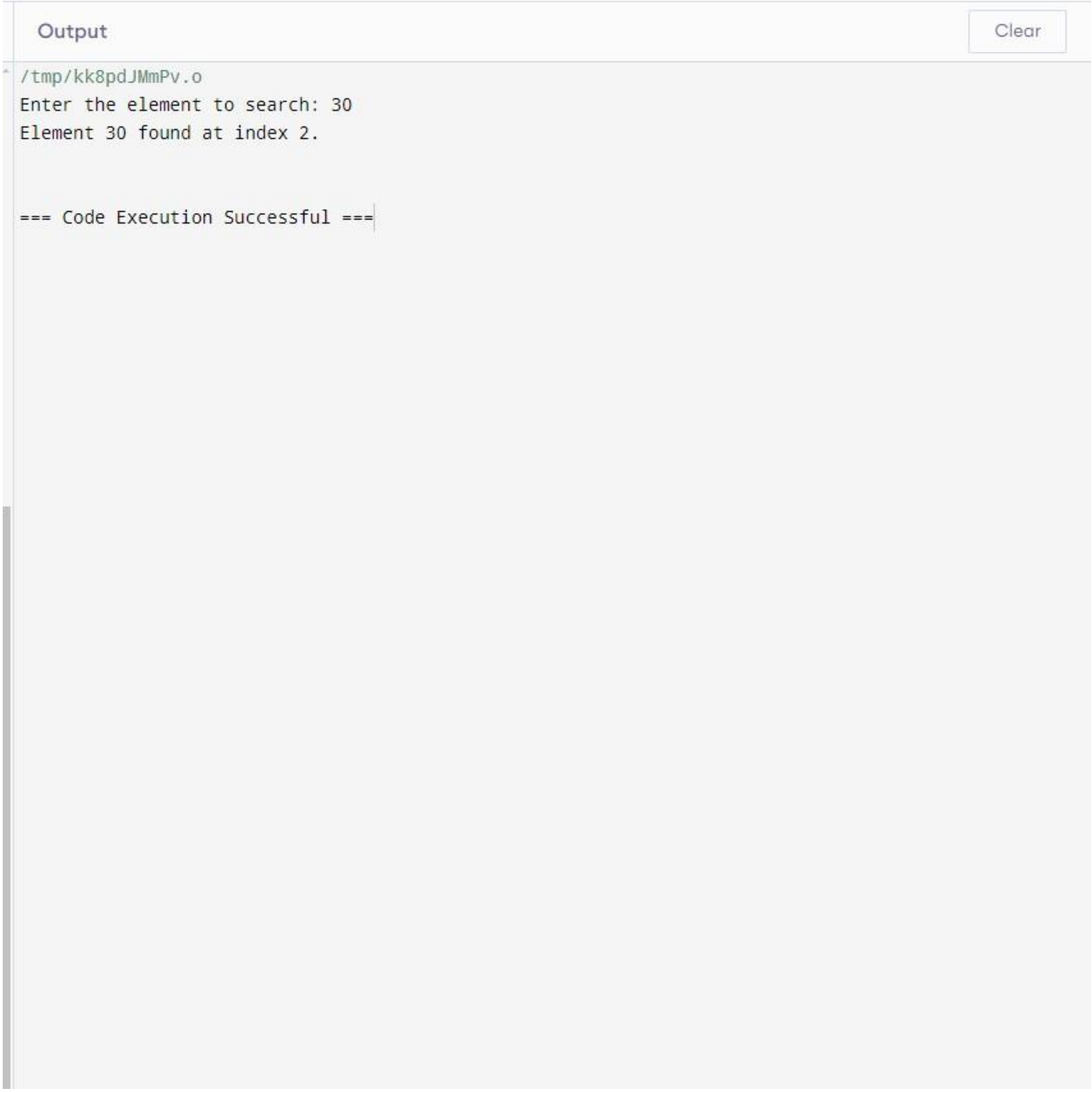
CODE:

```
#include <stdio.h>

#include <stdlib.h>
```

```
struct Node {     int
data;
   struct Node* next;
};
struct Node* createNode(int data) {
   struct Node* newNode = (struct Node*)malloc(sizeof(struct Node));
newNode->data = data;     newNode->next = NULL;     return
newNode;
}

int search(struct Node* head, int target) {
struct Node* current = head;     int index
= 0;

   while (current != NULL) {
if (current->data == target) {
return index;
      }
      current = current->next;
index++;
   }
   return -1;
}
int main() {
   struct Node* head = createNode(10);
   head->next = createNode(20);
```

```
    head->next->next = createNode(30);     head->next->next-
>next = createNode(40);     head->next->next->next->next =
createNode(50);
    int target;
    printf("Enter the element to search: ");
scanf("%d", &target);

    int result = search(head, target);

    if (result != -1) {
        printf("Element %d found at index %d.\n", target, result);
    } else {
        printf("Element %d not found in the linked list.\n", target);
    }
    struct Node* current = head;
struct Node* nextNode;
while (current != NULL) {
nextNode = current->next;
free(current);        current =
nextNode;
    }
    return 0;
}
```

OUTPUT:



```
/tmp/kk8pdJMmPv.o
Enter the element to search: 30
Element 30 found at index 2.


=== Code Execution Successful ===
```

TIME COMPLEXITY:

- Time Complexity: O(n)-(worst and average case)
- Best Case: O(1)- (if the target is the first element)

Conclusion:

- **For Search Operations:** If you frequently need to search for elements and the size of the data set is relatively static, arrays are typically better due to their O(1)access time.

- **For Frequent Insertions/Deletions:** If you often need to modify the list (insertions and deletions), linked lists are generally more efficient.