

# Lab 2 Report

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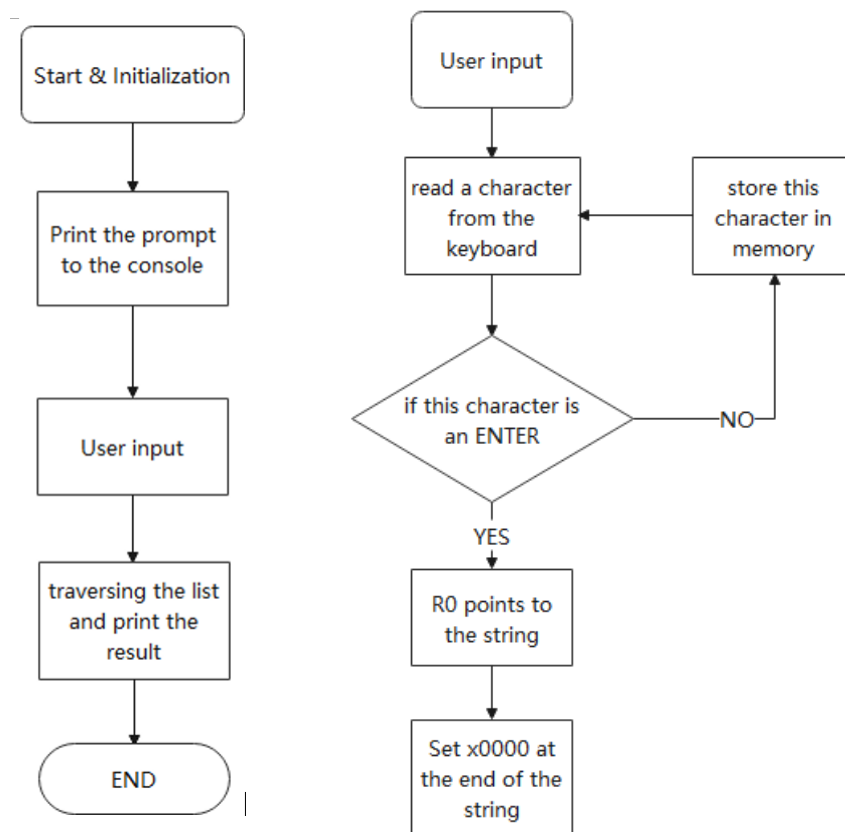
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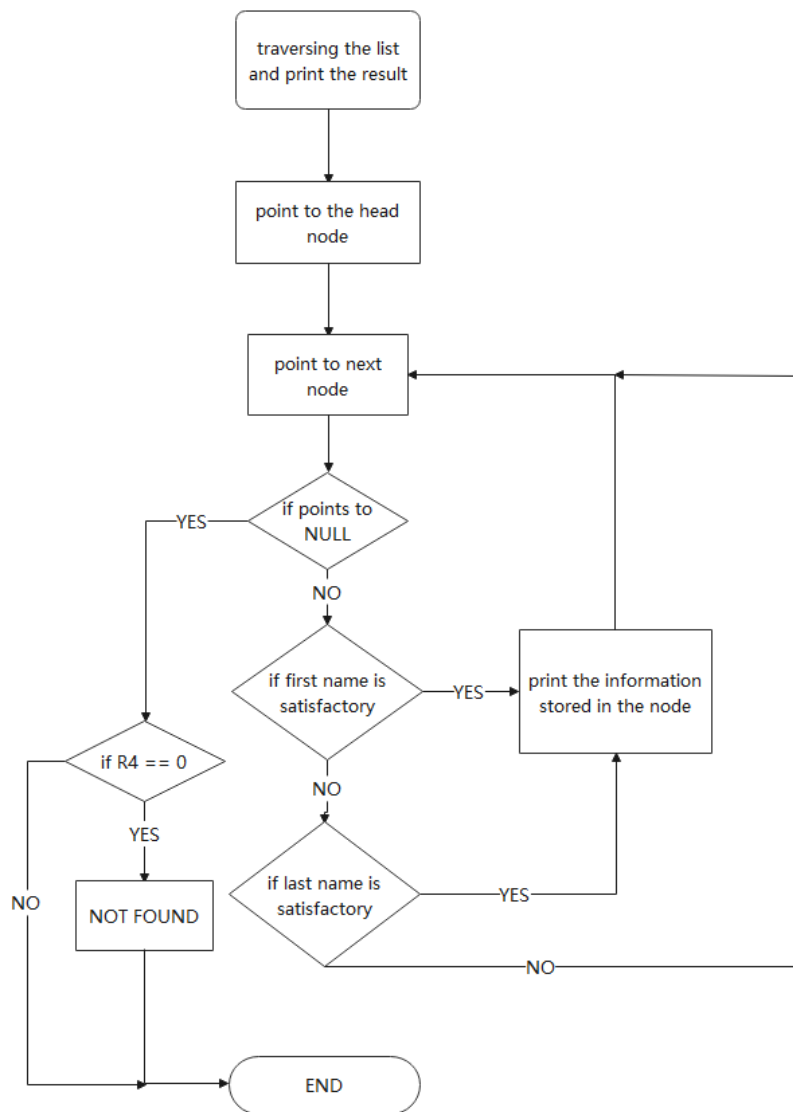
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## 1. Algorithm

The following chart shows the structure of the algorithm:





**TIP:** The first chart is the overall structure of the algorithm.

## 2. Essential parts of code

```

1  ; Search process
2  ; R0 is the head pointer of the user input string
3  NEXT      LD   R0, ZERO
4             STR  R0, R1, #0           ; SAVE A x0000 AT THE END OF STRING
5             AND  R1, R1, #0
6             LEA  R0, INPUT
7             LD   R3, ADDR             ; R3 is a pointer, point to the head of
            address
8                                     ; book(x4000)
9                                     ; R3 points to the first node
10 LOOP      AND  R5, R5, #0
11           LDR  R3, R3, #0           ; POINT TO NEXT NODE
12           BRnp L0
13           BR   RESULT              ; R3 -> null, ALL THE NODES HAVE
            BEEN SEARCHED
14
15 L0        ADD  R3, R3, #2           ; POINT TO the FIRST NAME
16           LDR  R1, R3, #0
17           JSR  STRCMP
18           AND  R5, R5, #1

```

```

19
20         BRnp L2
21         JSR  PRINT1
22         ADD  R3, R3, #-2
23         BR   LOOP                                ; if first name is satisfactory, we
do not need
24                                                ; to check the last name
25 L2         ADD  R3, R3, #1                        ; POINT TO LAST NAME
26         LDR   R1, R3, #0
27         JSR   STRCMP
28         AND   R5, R5, #1
29
30         BRnp L1
31         JSR   PRINT2
32 L1         ADD  R3, R3, #-3
33         BR   LOOP
34
35 RESULT    ADD  R4, R4, #0                        ; if R4 = 0, not found
36         BRp   L4
37         LEA   R0, NotFoundP
38         PUTS

```

The steps are explained in detail in the chart above.

### 3. TA's questions

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**TA: How to traverse the linked list ?**

Answer: First, the pointer points to the first name, then compare the first name with the user input string, if not satisfied, then move the pointer to last name, then compare, if satisfied, print the information of this node, else, move to the next node.

**TA: If first name is satisfied, what's the next step ?**

Answer: If first name is satisfied, and we print the information, then move the pointer to next node directly, do not need to compare last name.

**TA: How to determine whether we have found information that meets the requirement ?**

Answer: Use R4 to decide, when we have found , R4++, after ending the loop, check the value in R4, if the value is 0, print "Not Found" to the console.