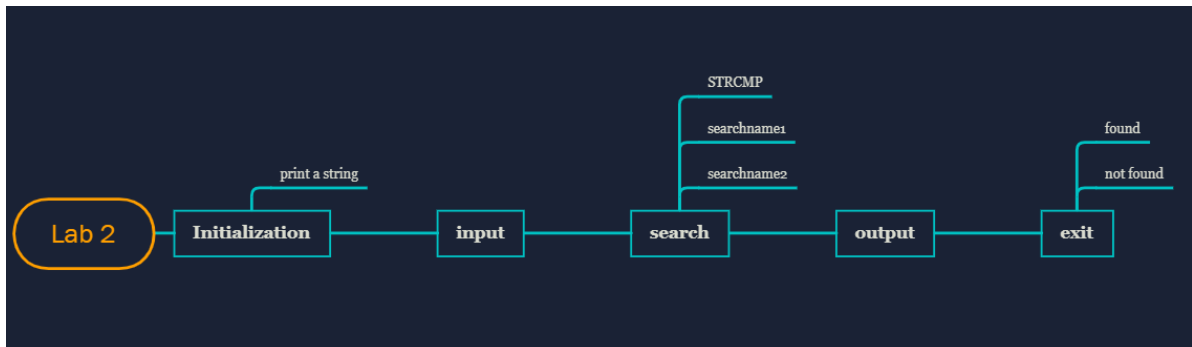


# Lab 2 report



## 1. Initialization

output the tip string

```
1  START      LEA R0, ENTER
2              PUTS
3              LEA R2, SPACE
4              LD R1, NEGNewLine
5  ENTER      .STRINGZ "enter a name: "
```

## 2. input

input until get a '\n'

```
1  INPUT      GETC
2              ADD R4, R0, R1
3              BRZ SEARCH ;check if the R0 is '\n'
4              STR R0, R2, #0
5              OUT
6              ADD R2, R2, #1
7              BRnzp INPUT
8  NEGNewLine .Fill xFFF6
9  SPACE      .BLKW #20;for the string to search
```

## 3. search (essential part)

In this module, the program search in the linked list to find out the data matching the input.

we use the subroutine STRCMP to check if the input is the same as the string in the linked list.

And we get R4 to be the key to judge if the program has found the matching data. If not R4 = 0, else R4 = 1. R4 is used to let the program output "Not found" if we didn't find the matching data in the program.

```
1  SEARCH      LDI R3, LIST_POSITION; R3 is the pointer to the linked list
2              LEA R2, SPACE; R2 is the pointer to the string we input
3              AND R4, R4, #0; R4 is the key to judge if the program
4              ;find the matching data
5  LOOP        ADD R3, R3, #0
6              BRZ EXIT ;judge if the rest linked list is empty
7  ;check the first name
8  CHECKNAME1  LDR R1, R3, #2
```

```

9          ADD R4, R1, #0
10         JSR STRCMP      ;check if the strings are the same
11         ADD R5, R5, #0
12         BRnp CHECKNAME2;if not the same, then check the last name
13         JSR OUTPUT      ;if they're the same, output
14         BRnzp NEXT
15         ;check the last name
16 CHECKNAME2 LDR R1, R3, #3
17           JSR STRCMP
18           ADD R5, R5, #0
19           BRnp NEXT
20           JSR OUTPUT
21         ;move to the next node
22 NEXT      LDR R3, R3, #0
23           BRnzp LOOP

```

```

1  ;subroutine STRCMP
2  ;check the two strings are the same or not. R5<=0, yes; R5<=1, no
3  ;the first pointer is converted in R1, and the other is in R2
4  ;use R3 and R4 to contain characters and compare them
5  ;this subroutine is written according to the textbook
6  STRCMP      ST R0, SAVESR0
7              ST R1, SAVESR1
8              ST R2, SAVESR2
9              ST R3, SAVESR3
10             ST R4, SAVESR4
11             AND R5, R5, #0
12             ;
13 NEXTCHAR     LDR R3, R1, #0
14             LDR R4, R2, #0
15             BRnp COMPARE
16             ADD R3, R3, #0
17             BRZ DONE
18             BRnzp FAIL
19             ;
20 COMPARE      NOT R3, R3
21             ADD R3, R3, #1
22             ADD R4, R3, R4
23             BRnp FAIL
24             ADD R2, R2, #1
25             ADD R1, R1, #1
26             BRnzp NEXTCHAR
27             ;
28 FAIL        ADD R5, R5, #1 ;R5<= No match
29 DONE        LD R0, SAVESR0
30             LD R1, SAVESR1
31             LD R2, SAVESR2
32             LD R3, SAVESR3
33             LD R4, SAVESR4
34             RET
35 SAVESR0     .BLKW #1
36 SAVESR1     .BLKW #1
37 SAVESR2     .BLKW #1
38 SAVESR3     .BLKW #1
39 SAVESR4     .BLKW #1
40             ;

```

## 4.output

if we find a data matching the input, we should output it.

the output subroutine is used to output the matching data we find, including first and last name and the room tag.

```
1  OUTPUT      LD  R0, NewLine
2              OUT
3              LDR R0, R3, #2
4              PUTS
5              LD  R0, BACKSPACE
6              OUT
7              LDR R0, R3, #3
8              PUTS
9              LD  R0, BACKSPACE
10             OUT
11             LDR R0, R3, #1
12             PUTS
13             AND R4, R4, #0
14             ADD R4, R4, #1; if we have output one data, R4<-1
15             RET          ; R4 is the key to judge if we found same data
16 BACKSPACE   .Fill x20
17 NewLine     .Fill xA
```

## 5.exit

To judge if we have found the matching data and end the program.

```
1  EXIT        ADD  R4, R4, #0
2              BRZ  NOT_FOUND
3              halt
4  NOT_FOUND   LD    R0, NewLine      ;if we don't find the matching data
5              OUT                    ;then we output "Not found"
6              LEA  R0, NOFOUND
7              PUTS
8              halt
9  NOFOUND     .STRINGZ "Not found"
```