Lab 2

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1. Introduction

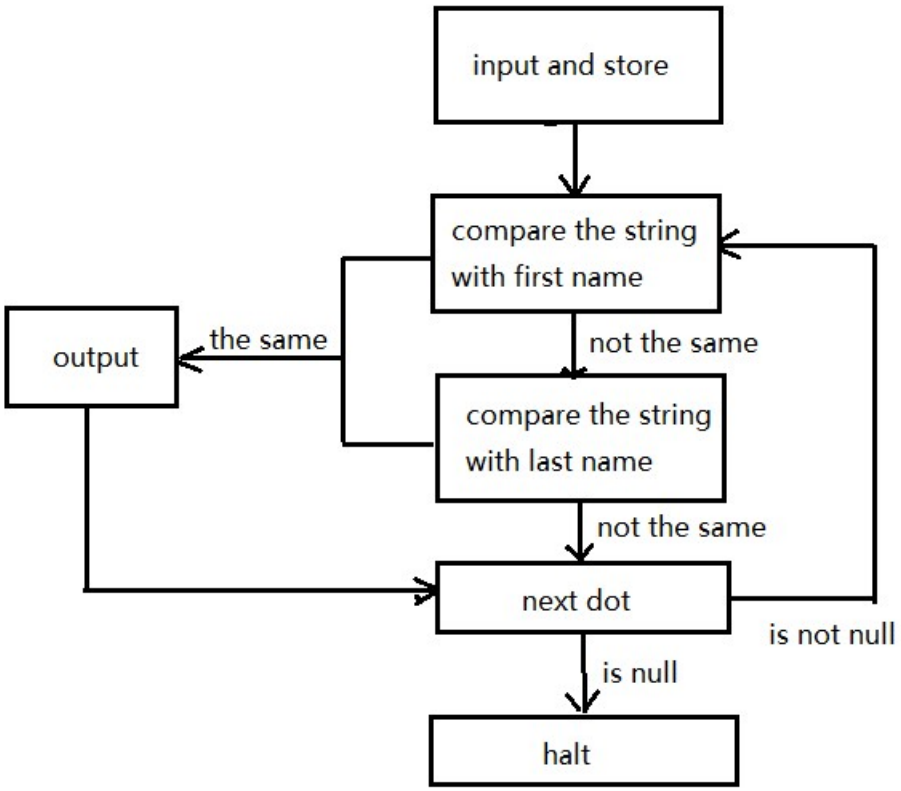
The program can output the corresponding full-names and office room numbers by the name user inputs and this report is supposed to introduce the algorithms and provide some test results of the example

2. Algorithm

First store the string user inputs

Then compare the first or last name in the first note with string, if the same, output the information.

Drop to the next note until it is null.



3. Testing Result

Test: Yale/Patt
Result:

```
Type a name and press Enter: Yale
Yale Patt 101
----- Halting the processor -----
Type a name and press Enter: Patt
Yale Patt 101
----- Halting the processor -----
```

This is the information in the first dot, and it's correct.

Test: Jiang
Result:

```
Type a name and press Enter: Jiang
Jiang Xiaohong 502
Jiang Zengkai 127
----- Halting the processor -----
```

This is two name information with the same first name, so it outputs the both, and it is correct.

Test: Qiu
Result:

```
Type a name and press Enter: Qiu
NOT FOUND
----- Halting the processor -----
```

There is no information of this name, so it outputs "NOT FOUND".

4. Discussion and Experience

Though this experiment, I gain a deeper knowledge about link-list and successfully work it out by searching the book about the instructions like STR, LEA. Actually I haven't met problems as many as I imaged, and I solve them quickly by debugging step by step. (It also improves my skills on debugging)

APPENDIX:SOURCECODE

R0:OUT and PUTS R1:address of the string R2:node of link-list R3:address of the first name, the last name R4:the ascii of string R5:the ascii of name

```
.ORIG x3000
                AND R0, R0, #0
                AND R3, R3, #0
                LEA R0, PROMPT
                PUTS
                LEA R1, NAME
GETNAME         GETC
                OUT
                ADD R2, R0, #-10
                BRz START
                STR R0, R1, #0
                ADD R1, R1, #1
                BR GETNAME              ; above is input
START           AND R0, R0, #0
                STR R0, R1, #0          ; set the last of the string x0000
                LEA R1, NAME
                LD R2, LINKBEGIN
                LDR R2, R2, #0
LOOP0           ADD R3, R2, #2
                LDR R3, R3, #0
LOOP1           LDR R4, R1, #0          ; check the first name
                LDR R5, R3, #0
                ADD R6, R4, R5
                BRz FOUND
                ADD R1, R1, #1
                ADD R3, R3, #1
                NOT R4, R4
                ADD R4, R4 #1
                ADD R4, R4, R5
                BRz LOOP1
                LEA R1, NAME
                ADD R3, R2, #3
                LDR R3, R3, #0
LOOP2           LDR R4, R1, #0          ; check the last name
                LDR R5, R3, #0
                ADD R6, R4, R5
                BRz FOUND
                ADD R1, R1, #1
                ADD R3, R3, #1
                NOT R4, R4
                ADD R4, R4 #1
                ADD R4, R4, R5
                BRz LOOP2
```

```
NEXT        LEA R1, NAME            ; check the next node
            LDR R2, R2, #0
            BRz OVER
            BR LOOP0
FOUND       ADD R0, R0, #0
            BRz OUTPUT
            AND R0, R0, #0          ; print an enter
            ADD R0, R0, #10
            OUT
OUTPUT      ADD R0, R2, #2          ; if is found
            LDR R0, R0, #0
            PUTS
            AND R0, R0, #0
            ADD R0, R0, #8
            ADD R0, R0, #8
            ADD R0, R0, #8
            ADD R0, R0, #8
            OUT
            ADD R0, R2, #3
            LDR R0, R0, #0
            PUTS
            AND R0, R0, #0
            ADD R0, R0, #8
            ADD R0, R0, #8
            ADD R0, R0, #8
            ADD R0, R0, #8
            OUT
            ADD R0, R2, #1
            LDR R0, R0, #0
            PUTS
            BR NEXT
OVER        ADD R0, R0, #0
            BRz NOFOUND
            HALT
NOFOUND     LEA R0, NOTFOUND            ; if is not found
            PUTS
            HALT
NAME .BLKW #20
LINKBEGIN .FILL x4000
NOTFOUND .STRINGZ "NOT FOUND"
NOP .FILL x0000
PROMPT    .STRINGZ "Type a name and press Enter: "
.END
```