Lab2 Report

ALGORITHM

The algorithm is :

- Output the “HELLO”one by one, using TRAP x21
- Get each char and check whether it's '\r'(Ascii 10), if it is '\r' then storage a 0 into and break else we storage it in address
- Load link ptr and load first name and second name to compare with the input , if it's same ,we add R6 ,R7 to remember and when we checked the second name and it's compared, we check one by one and if one is different ,we stop check and go straight , we output the first name\second name and number , then we change the ptr to next ptr
- If we found the ptr==null, then we check the calculate number. If it's 0 then we output "Not Found" ,else we do nothing
- Finally ,HALT

CODE

```
.ORIG   x3000
    LEA R1,HELLO;ready to output hello
   LDR R0,R1,#0;
  LOOPHELLO  BRz BEGIN_INPUT; begin to input
    TRAP    x21;output R0(hello)
   ADD  R1 ,R1, #1;
   LDR  R0, R1, #0;
   BRnzp    LOOPHELLO;

BEGIN_INPUT
    LEA R1 INPUT;R1 is a place for input address
    AND R2, R2, #0;
    ADD R2, R2, #-10;test space
    LOOPINPUT GETC;read char
    ADD R3, R0, R2;
    BRz BEGIN_FIND;if R3 == 0 ,then go to find
     TRAP   x21; ;begin store
    STR R0, R1, #0 ;  store in INPUT ADDRESS
    ADD R1, R1, #1;  R1 is the now storage address
    BRnzp   LOOPINPUT;

BEGIN_FIND
    AND R0, R0, #0; clear r0,r7,r6,and r1
    STR R0, R1, #0;
    AND R7, R7, #0;
    AND R6,R6,#0;
    LD  R1, PTR;R1 now is x4000

    LOOPFIND LDR R2,R1, #0;   R2 now is next ptr
    BRz ENDFIND; if ptr == 0 finish the loop

    ADD R3, R2, #2;
    LEA R0, INPUT;
    LDR R3, R3, #0;  R3 is the ptr and R0 is the input
```

```
FINDFIRST  LDR R4,R3,#0;
BRz #3;
LDR   R5, R0, #0;
BRz #13;  find
BRnp #3;  continue
LDR   R5, R0, #0;
BRz #8;
BRnp #9;

  ADD R3, R3, #1;
  ADD R0, R0, #1;
  NOT R5,R5;
  ADD R5, R5, #1;
  ADD R5, R4, R5;
  BRz FINDFIRST;
  BRnp    #2;
  ADD R7, R7, #1;
  ADD R6,R6,#1;

  ADD R3, R2, #3; reset
  LDR R3, R3, #0; don't forgot to LDR R3
  LEA R0, INPUT;
  FINDSECOND LDR  R4, R3, #0;
  BRz #3;
  LDR R5, R0, #0;
  BRz #13;  find
  BRnp #3;  continue
  LDR R5, R0, #0;
  BRz #8;   like the first choose
  BRnp #9;
  ADD R3, R3, #1;
  ADD R0, R0, #1;
  NOT R5,R5;
  ADD R5, R5, #1;
  ADD R5, R4, R5;
  BRz FINDSECOND;
  BRnp #2;
  ADD R7, R7, #1;  R7 is now's code R6 is the  found number
  ADD R6, R6, #1;

  ADD R7, R7, #0;
  BRz #13;
  AND R0, R0, #0;
  ADD R0, R0, #10;
  OUT;          ;  if it is found   put the final
  LDR R0, R2, #2
  PUTS;
  LEA     R0, SPACE;
  PUTS;
  LDR R0, R2, #3;
  PUTS;
  LEA     R0, SPACE;
  PUTS;
  LDR R0,R2,#1;
  PUTS;

  AND R7, R7, #0;
  ADD R1, R2, #0;
```

```
    BRnzp   LOOPFIND;

ENDFIND  ADD R6,    R6, #0;  ready to output
    BRnp #5;  negative or positive will HALT
    AND R0, R0, #0; zero will output \r NOTFOUND
    ADD R0, R0, #10;
    OUT;
    LEA R0, NOTFOUND
    PUTS;
    HALT

INPUT .BLKW #16  ;address for data
PTR .FILL    x4000;begin Ptr
SPACE .STRINGZ  " " ;  SPACE code
;Enter .FILL    x000D;
HELLO  .STRINGZ "Enter a name: "
NOTFOUND .STRINGZ   "Not Found";
HALT
.END
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Q&A

Q: 第一个大循环的跳出条件

A: 以r6为标志位的寄存器开始判断，若为1，则即刻跳出并开始输出，若为0，则指针指向结尾的时候为跳出条件。