Homework 8

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试卷得分 4

1. MODIFIED.

   9.16 a. How many trap service routines can be implemented in the LC-3? Why?

   b. Why must an RTI instruction be used to return from a TRAP routine? Why won’t a BR (Unconditional Branch) instruction work instead?

   c. How many accesses to memory are made during the processing of a TRAP instruction? Assume the TRAP is already in the IR.

简答题 (3 分) 2 分

a. the trap vector is 8 bits, so totally there are 256 trap service routines be implemented
b. the TRAP routine store the next instruction address in R7 and change PC to the TRAP instruction, but if we don't RTI after trap routine, the PC willn't return to the correct address ( which STORE in R7).Unconditional Branch is also useless because it doesn't change PC
c. only one time when the TRAP instruction will be zero-extend to the 16-bits and this 16-bits will be send to MAR and the value will be read in MDR.

2. 10.7 What does the following LC-3 program do?

```
1            .ORIG   x3000
2            LEA     R6, STACKBASE
3            LEA     R0, PROMPT
4            TRAP    x22           ; PUTS
5            AND     R1, R1, #0
6  LOOP      TRAP    x20           ; IN
7            TRAP    x21
8            ADD     R3, R0, #-10  ; Check for newline
9            BRz     INPUTDONE
10           JSR     PUSH
11           ADD     R1, R1, #1
12           BRnzp   LOOP
13 INPUTDONE ADD     R1, R1, #0
14           BRz     DONE
15 LOOP2     JSR     POP
16           TRAP    x21
17           ADD     R1, R1, #-1
18           BRp     LOOP2
19 DONE      TRAP    x25           ; HALT
20
21 PUSH      ADD     R6, R6, #-2
22           STR     R0, R6, #0
23           RET
24
25 POP       LDR     R0, R6, #0
```

简答题 (2 分) 2 分

this program reverse the input of user's input by using the stack.