UNB
Faculty of Computer Science
Assignment 5 CS2253 Fall 2021

Due Date: November 4, 2021 - 8:30 am

Purpose: Questions on IO and TRAP service routines

1. a) Write a subprogram `ISALPHA` that checks if a single ASCII character is alphabetic (i.e. between 'A' and 'Z' or between 'a' and 'z'). The char is passed in R0. If the char is alphabetic R0 must be set to 1, to 0 otherwise.

   b) Write a program that reads a character from the console and prints a message to the console indicating whether the character is alphabetic, using the subprogram from part a.

2. Write a new trap service routine that reads a line of text from the console and stores the resulting string beginning at the address given in R0. The routine also echoes the line to the console as it is typed. The routine uses the trap vector `x26` and is stored beginning at address `x028A`. Use the following code to test your program:

```
        .ORIG x3000
        LEA R0,MESS
        PUTS
        LD R0,LOC
        TRAP x26 ; string stored at x3100
        PUTS
        HALT
MESS    .STRINGZ "enter line: "
LOC     .FILL x3100
        .END
```

Your trap vector table entry and the service routine code can be added to the same file as the above program using separate `.ORIG ... .END` blocks.

3. (textbook, **corrected version of**question 9.28) Suppose we define a new service routine starting at memory location `x4000`. This routine reads in a character and echoes it to the screen. Suppose memory location `x0072` contains the value `x4000`. The service routine is shown below:

```
.ORIG x4000
GETC
OUT
RTI
```

a) Identify the instruction that will invoke this routine
b) Will this service routine work? Explain.

4. (textbook, question 9.42) Suppose the keyboard interrupt vector is `x34` and the keyboard interrupt service routine starts at location `x1000`. What can you infer about the contents of any memory location from the above statement?

Submit your assignment: Write up your assignment using a word processor, including code listings for questions 1 and 2 (not snapshots from LC3Tools) and your answers for questions 3 and 4, and submit it as a pdf. Also **submit a single `.zip` file containing the .asm files with the programs for questions 1 and 2.**