**CSCI240 – Computer Organization and Assembly Language Programming**

**Name:**  Jonathan Limpus

**Student ID:** 1429394

**Assignment:** Homework 9 – TRAP Routines and Subroutines

3) a. The only thing that can start the clock after the system is halted is some kind of external means to modify bit 15 of the machine control register.

b. STI R0 MCR stores the value x7FFE (xFFFE AND x7FFF) into the MCR, which stops the machine when the most significant bit is set to 0.

c. The next instruction to be executed will be LD R1 SaveR1.

d. The RET will return to whichever routine called the HALT instruction.

4) a. Location x3005 contains the machine code instruction for OUT, which is 1111 0000 0010 0001.

b. The first instruction of the TRAP x21 routine will be executed, which is located at the address x0430.

c. The RET instruction at x0437 in TRAP x21 will be executed.

d. This program outputs the string “HookemHorns” by only outputting every other character within the string.

5) It outputs the first string, “FUNKY”.

8) The program stores a 1 in RESULT if the number is prime, and a 0 otherwise.

9)

12) The final values of DATA are the initial values, but sorted.

15) a) This routine is invoked by TRAP x72

b) This service routine will work, with the possibly unintended side effect of R0 being overwritten.

18) a) ADD R1 R1 1

b) HALT

c) ADD R0 R0 5

d) BRzp K