Homework 9

Homework instructions

1. **(2 points)** Write a subroutine that will take a numeric digit entered at the keyboard, echo it to the screen, and store in R0 the corresponding binary value: so if the user types the digit '7', the character '7' will appear on the screen, and the value stored in R0 will be b0000 0000 0000 0111 This is almost the same as the polling routine described in chapter 8 (i.e. the TSR for TRAP x20), except for the final manipulation on storing the value.
2. **(2 points)** Now describe everything that would be required to make this subroutine into a Trap Service Routine.
   Consider::
   - Where the code will have to be assembled to (i.e. what value to use for .ORIG)? *(Hint: avoid existing TSRs, but locate it close to them)*
   - What TRAP vector will you use? *(Hint: avoid the vectors already in use!)*
   - Given that we can't actually re-write the BIOS, we will have to assemble our code together with our regular programs: so how will you get an entry into the TRAP Vector Table? *(Note: in the standard mode of our LC-3 emulator, the relvant region of memory is not protected, i.e. it is programmer accessible)*

   Finally, show how your new TSR would be used.
3. **(1 point)** 8.6
4. **(1 point)** 8.9
5. **(1 point)** 8.10
6. **(1 point)** 8.12
7. **(1 point)** 8.13
8. **(1 point)** 8.14