You are to write the following program. A workable version of the program will be shown in class in the following session. Please complete the program at home after leaving class, enter it into Notepad® and run it successfully in SPIM. Your program is to do the following:

1. Input a number (using syscall 5) between 0 and 255.
2. Check the number to assure it is within the limits.
3. Convert this decimal number to binary and output the binary answer to the console.
4. Note that since you really cannot output a number in binary form in SPIM, you will have to check each bit of the number, and output each 1 and 0 separately (either as #’s or as ASCII code for #’s, your choice).
5. The magnitude of the number will always be 8 bits (1111 1111, = 255 decimal) or less.
6. Leading zeroes are okay. This means that you will always have an 8-bit output, but there may be some leading zeroes, depending on the size of the number.
7. Make sure you check the MSB of the number first and then go to the lower-significance bits, as you will be outputting characters representing the 1’s and 0’s in descending order on the console.
8. Since you need $v0 for many things, make sure to move the number input to $t0 to test it.
9. The next page is for programming. Note that the beginning of the program and the data declaration have been given.
Decimal-to-Binary Conversion Program

# Converts a number between 0 and 255 to its binary equivalent and
# outputs the binary number to the console.
# Tests to make sure that the number is between 0 and 255 (0 to 1111 1111).

.main:

.data
req:   .asciiz "Input a decimal number between 0 and +255."
ans:   .asciiz " is the binary equivalent of "
crlf:  .asciiz "\n"
mis:   .asciiz "Error -- number is not within prescribed limits!"

# End of file, Decimal-to-Binary conversion Program.