CS061 – Programming Assignment 03

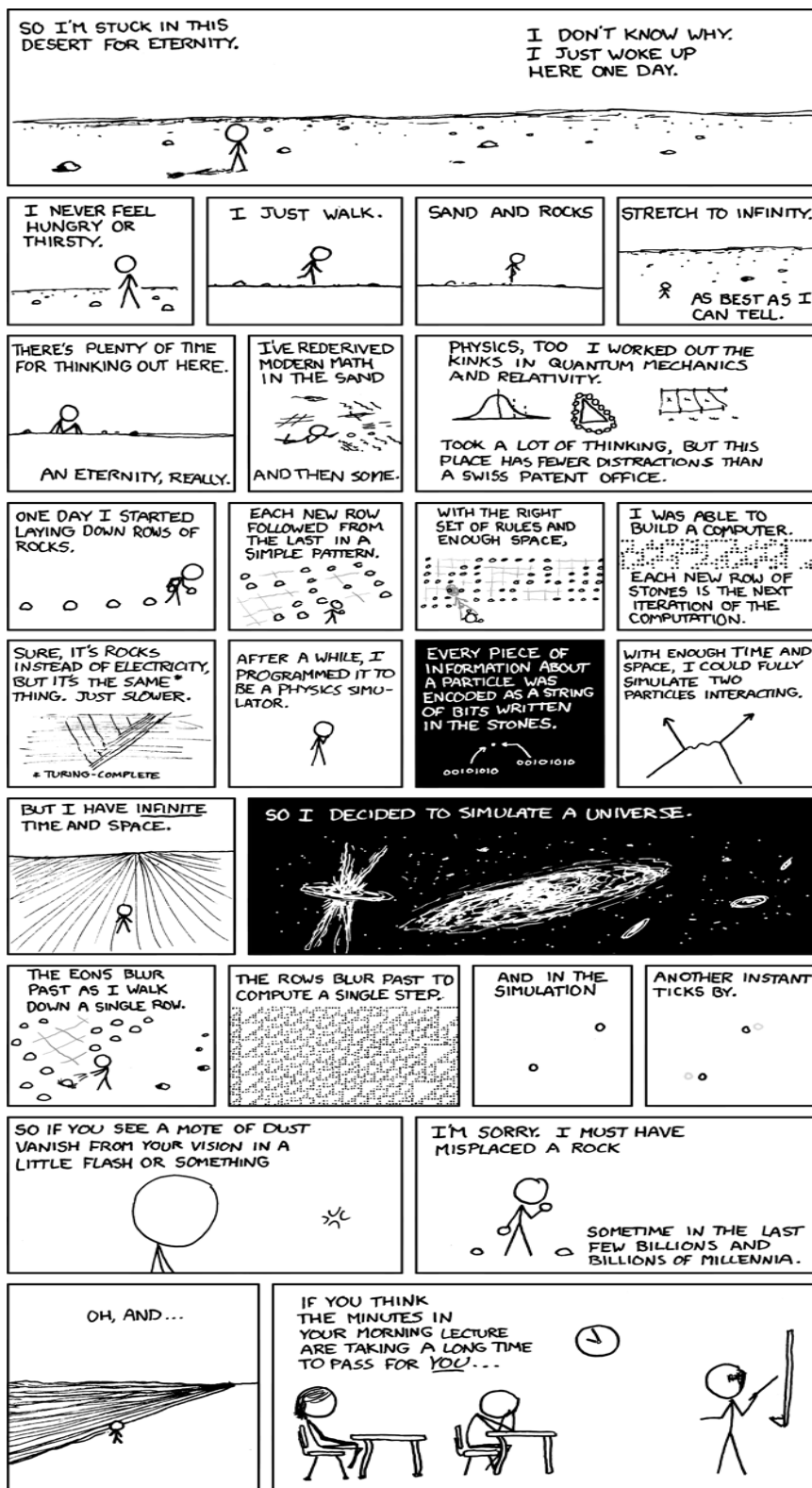| Objective	The purpose of this assignment is to give students practice with I/O, left-shifting, and useful 2's complement logic.

High Level Description	Load any valid number into a register and output it to the console in binary.
	Note: Valid numbers are [#-32768, #32767] (decimal) or [x0000, xFFFF] (hex)

Example	If you load the value #169 and want to print it, you should print: "0000 0000 1010 1001" (spaces not necessary, (though they will be later, so…))
	For ease of testing, you can also load hex values. So xABCD should print: "1010 1011 1100 1101"
	As you can see, using Hexadecimal values makes testing your programs a *lot* easier - get used to it now, as you will be needing it <u>*all quarter long*</u>.

Your Tasks	Once the number is hard-coded into memory (.FILL) and loaded (LD) into a register, the system "understands" that the value is a 2's complement number *(that's the only kind of arithemtic it can do)*.
	It is now your job to extract the 1's and 0's from the number and print them out one by one, from left to right.
	
	Important things to consider:
	• Recall the difference between a positive number and a negative number in 2's complement binary. If the most significant bit (MSB) is 0, the number is positive. If the MSB is 1, the number is negative.
	• The **BR**anch instruction has condition codes which can check whether a value is **n**egative, **z**ero, or **p**ositive.
	• Once you are done inspecting the MSB, how would you *shift* the next bit into its place so you could perform the next iteration? (hint: the answer is in the objectives)
	
	Pseudocode:
	   for(i = 15 downto 0):
	     if (bit[i] is a 0):
	       print a 0
	     else:
	       print a 1

Uh…help?	See "Important things to consider". If that doesn't help after a few hours, post to the forums

Rubric	- Code does not assemble: -10 points (no reshow) - Assignments with no header: -5 points (if we can figure out who you are!) - Well commented code: +2 points - Correct use of TRAPs: +2 points - Correct ASCII to representative number conversion: +2 points - Correct Two's Complement conversion: +2 points - Correct output: +2 points

Comics??! Sweet!!!

Source: http://xkcd.com/505/