CPSC 31 Intro to Computer Systems

Assignment #3

Due at the beginning of class, Thursday March 30

Please print this handout, and write your answers directly on the printout.

(a) (read this part carefully, it's not the same as on the midterm)

For each line of the assembly function in page 2, list ALL registers and memory locations that are directly modified by the instruction.

When memory is read or modified, you should use notation similar to that used on the cheat sheet to indicate the location where it is read or modified.

You should only list `%eip` when a jump occurs, not when it is incremented normally.

(b) In the diagram of page 3, list (in order) every value that each register or memory location takes on during the function from part (a). All initial values, and all but the final `%eip` value, are provided. You may represent any value in hex or decimal, whichever is most convenient.

(c) What does the function do?

foo:	storage locations modified:
pushl %ebp	
movl %esp, %ebp	
subl $4, %esp	
movl 8(%ebp), %ecx	
movl (%ecx), %eax	
movl %eax, -4(%ebp)	
movl $1, %eax	
jmp L1	
L3: movl (%ecx,%eax,4), %edx	
cmpl -4(%ebp), %edx	
jle L2	
movl %edx, -4(%ebp)	
L2: addl $1, %eax	
L1: cmpl 12(%ebp), %eax	
jl L3	
movl -4(%ebp), %eax	
leave	
ret	

register	sequence of register values
%ebp	0xffffd5e8
%esp	0xffffd5ac
%eip	0x080484e8 0x080484e9 ⋮ (blah blah) ⋮ 0x08048516 0x08048517
%eax	0xffffd5cc
%ecx	0xffffd600
%edx	0xffffd624

mem address	seq. of stored values
0xffffd5a4	47
0xffffd5a8	0xf7df1dc8
0xffffd5ac	0x080484b1
0xffffd5b0	0xffffd5cc
0xffffd5b4	4
⋮ ⋮	⋮ ⋮
0xffffd5cc	1
0xffffd5d0	17
0xffffd5d4	9
0xffffd5d8	3