CSC258 Computer Organization 2015 fall
Assignment 3 due Thu.Dec.3 at 6pm in BA2220
solutions

1[35] Write a program in CSC258 assembly language to implement a calculator.

§ No solution given for this question.

2 Write a microprogram (sequence of register transfers) for the CSC258 computer that implements each of the following instructions. Describe any special details or changes to the basic computer that are needed to add these instructions to the machine. Do not make any changes to the machine that are not needed.

(a)[5] BCT *m* (Branch-on-CounT is an IBM mainframe instruction) The content of the accumulator (viewed as a 2's complement number) is decremented by 1. If the result is non-negative, control is transferred to location *m*. (The E bit may change.)

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AC	→	AL1	
ONE	→	AL2	ONE is a new source: 1 on data line 0
IR	→	ALF	BCT op-code causes subtract
ALU	→	AC	
IR	→	M0	
PC+1	→	M1	
AC	→	MS	
MUX	→	PC	

(b)[5] EXE *m* (EXEcute) Execute the instruction in memory location *m*. This is not a branch to location *m* because the instruction executed after this one is the instruction located after this EXE instruction (unless the instruction in memory location *m* happens to be a branch).

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IR	→	MAR	
RAM	→	IR	here, the third field, the next micro-instruction address would normally be FETCH, but instead it's 0 which is the code that starts EXECUTE