**Questions:**

As part of your project, answer the following questions. You may discuss the concepts with others in the class, but each of you must submit your answers in your own words.

1. What opcode will blank memory initialized to 0x00 look like to the processor?

Store memory op using ACC and Operand as address

1. Of the 256 possible opcodes we can get from and 8-bit opcode, how many are not being used in our instruction set, i.e., how many instructions could we add for future expansions of our processor?

Math operations = 128

Memory operations = 12

Branches/Jumps = 7

Special = 2

256 – (128+12+7+2) = 107 remaining

1. What would we need to add to our simulator to be able to include the following instructions: compare ACC with a constant, PUSH to or PULL from the stack, and take the 2's complement of ACC?
   1. compare ACC with a constant
      1. 1 opcode for comparison between ACC and another number
   2. PUSH to or PULL from the stack
      1. 1 opcode for push
      2. 1 opcode for pull
      3. A stored global stack structure
   3. take the 2's complement of ACC
      1. nothing needed to add, to take the 2’s compliment use the NOT opcode then the INC opcode, both on ACC
2. If executeInstruction() were divided into two parts, decode and execute, what additional global resources would be needed for your simulator?
   1. A global state table to decode instructions