CA Tutorial

1. Given CPU with an 8-bit word, 8 registers, and instructions that are exactly 1 word long and which has 2 operands:

   a) How long can the opcode field be in an instruction?
      - 8 bits-Opcode size should be less than memory address, so the maximum size of opcode should be 4 bits.

   b) How many instructions can the CPU support?
      - 2^8 = 256

2. Consider a computer that is used for simple numeric problems. It uses 6 bits for an opcode, and 12 bits for a memory address.

   a) What is the size of its instruction?
      - 12 bits + 6 bits = 18 bits

   b) How many different instructions can it have?
      - 2^6

   c) What is the maximum memory size that it can address?
      - 2^{12}