Questions 2 and 4 were the most difficult.

1. Why does the least-significant digit of a binary number indicate if the number is odd or even?
   A. Because it represents the 2's place.
   B. Only even numbers have zero as the LSB.
   C. No odd numbers have one as the LSB.
   D. Because the LSB will hold the value of the number mod 1.

2. Perform the subtraction operation on the following two’s complement numbers below. Show your final answer as a decimal number. Circle it.

   01010000
   - 11111111
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   81

3. Convert the base 5 number 2004 to decimal.

   2x125 + 0x25 + 0x5 + 4 = 254

4. Sign extend the 2 digit hex number 0x88 to a 4 digit hex number.

   0x00FF88
   Sign extend means to fill the left bits with the left-most bit of the original binary pattern. 0x88 = 10001000. Fill with 1's.

5. The following sub instruction is located at address 0x00012344. What are the two possible values for the contents of the Program Counter (PC) register after the branch instruction has executed? Give two values in 0x format. Circle the answers.

   loop:   addi $t4, $t4, -8 <-- 0x00012340 here
          sub  $t2, $t2, $t0 <-- 0x00012344
          bne  $t4, $t2, loop <-- 0x00012348
                      <-- 0x0001234C here (it's hex)
   0x00012340, 0x0001234C

6. This value is currently in register $t1: 11111111111111111111111111100100
   After this shift-right-arithmetic instruction sra $a0, $t1, 2
   What will be in $a0? Show answer in hex (0x) format.
   0xFFFFFFF9
   sra maintains the sign bit. Ones will be shifted in from the left.

7. This instruction lb $t2, 0($t1) loads a byte of memory from the address in $t1 into register $t2. If the value at the address is decimal 43, an Ascii plus sign, what is the value in $t2 after the instruction finishes?

   A. 0x0000002B
   B. 0xFFFFFFF2B
   C. 0x11111143
   D. 0x2B000000