CS 2340 Assignment 2

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Question 1

1. Convert to binary:
   I. $2483_{10} = 100110110011_2$
   II. $3E8A_{16} = 0011\ 1110\ 1000\ 1010_2$
2. Convert 8-bit binary to decimal:
   I. $11101011 = 235_{10}$ and $-11101011 = 00010101 \therefore -21_{10}$
   II. $10000000 = 128_{10}$ and $-10000000 = 10000000 \therefore -128_{10}$
   III. $01000101 = 69_{10}$ and $-01000101 = 10111011 \therefore -69_{10}$

Question 2

Do the following addition exercises by translating the numbers into 8-bit 2's complement binary numbers, performing the arithmetic, and translating the result back into a decimal number. Indicate where overflow occurs and why, based on the binary arithmetic:

a. $47_{10} + 38_{10} = 0010\ 1111 + 0010\ 0110 = 0101\ 0101_2 = 85_{10}$

b. $47_{10} - 38_{10} = 0010\ 1111 - 1101\ 1010 = 0010\ 1111 + 1101\ 1010 = 1000\ 1001_2 = -9_{10}$