HW 4: Unsigned Binary Addition

For each of the <**X**, **Y**> pairs below:

a) Convert **X** and **Y** → binary

b) Use binary addition, to compute the 8-bit **sum**

c) Convert the **sum** → hexadecimal

d) Indicate whether the sum produces a carry

e) Convert **X**, **Y**, **sum** → decimal (to check your work)

Where <**X**, **Y**> =

1) <0x**4F**, 0x**6D**>

2) <0x**C8**, 0x**2B**>

3) <0x**A3**, 0x**95**>

4) <0x**B4**, 0x**E1**>

Example X1

<X, Y> = <0x9E, 0x7A>

<X, Y> = <0b10011110, 0b01111010>

X + Y = 10011110
01111010

carry 1 1 1 1 1 1 1 0

100011000 → 0x18 + 0x100

X	= 9·16 + 14	= 158	
Y	= 7·16 + 10	= 122	
sum	= 1·16 + 8	= 24	
X + Y	= 280	≠ 24	
X + Y	= 280	= 24 + 256	
carry	= $1 \cdot 16^2$	= 256	

Example X2

<X, Y> = <0xB5, 0x3C>

<X, Y> = <0b10110101, 0b00111100>

X + Y = 10110101
00111100

carry → 0 0 1 1 1 1 0 0 0
011110001 → 0xF1 + 0x0

X = 11·16 + 5 = 181

Y = 3·16 + 12 = 60

sum = 15·16 + 1 = 241

X + Y = 241 = 241

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#X2 X = 0xB5 Y = 0x3C

a) X = 0b10110101 Y = 0b00111100

b) X + Y = 10110101
00111100
0 0 1 1 1 1 0 0 0
11110001

c) sum = 0xF1

d) carry = 0

e) X = 11·16 + 5 = 181
Y = 3·16 + 12 = 60
sum = 15·16 + 1 = 241
X + Y = 241 = 241