CS 270 Fall 2013 Quiz 1: FP Addition

Posted 13 Oct 2013, Due: **Wednesday 23 Oct 5:00 pm**

Name _____

A and B are two 16-bit values representing half-precision floating point numbers. You are to add them up using the algorithm that you will be implementing for PA3. A = `F0A0`, B = `610F`.

a. Write out B in line 2.

b. Which number (A or B) is to be shifted? Right or Left?

c. By how much?

d. Show the result of this shift in line 3 (fractional part only).

e. Now we need to do which of the following?

1. Add the shfted fractional part to the unshifted one
2. subtract the unshifted one from the shifted one,
3. subtract the shifted one from the unshifted one.

f. Do this and show the partial result (just the fractional part) on line 4.

g. Normalize back as needed and write the final answer with the appropriate exponent and sign in line 5.

A	1	1	1	1	0	0	0	0	1	0	1	0	0	0	0	0
B																
Shifted A or B																
Sum/Diff																
Result																

Now let's do a couple more. A = 3F80, B = 3BA0.

a. Write out B in line 2.

b. Which number (A or B) is to be shifted? Right or Left?

c. By how much?

d. Show the result of this shift in line 3 (fractional part only).

e. Now we need to do which of the following?

1. Add the shfted fractional part to the unshifted one
2. subtract the unshifted one from the shifted one,
3. subtract the shifted one from the unshifted one.

f. Do this and show the partial result (just the fractional part) on line 4.

g. Normalize back as needed and write the final answer with the appropriate exponent and sign in line 5.

A	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0
B																
Shifted A or B																
Sum/Diff																
Result																

Now $A = \texttt{F38F}$, $B = 7380$.

a. Write out B in line 2.

b. Which number (A or B) is to be shifted? Right or Left?

c. By how much?

d. Show the result of this shift in line 3 (fractional part only).

e. Now we need to do which of the following?

1. Add the shfted fractional part to the unshifted one
2. subtract the unshifted one from the shifted one,
3. subtract the shifted one from the unshifted one.

f. Do this and show the partial result (just the fractional part) on line 4.

g. Normalize back as needed and write the final answer with the appropriate exponent and sign in line 5.

A	1	1	1	1	0	0	1	1	1	0	0	0	1	1	1	1
B																
Shifted A or B																
Sum/Diff																
Result																