CAD For VLSI (CS6230) Final Project
Project Title : P2. Pipelined double precision(fp64) floating point adder

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Test Cases used

Binary value = (-1) Sign bit * 2 (Exponent – 1023) * 1.Mantissa

Positive + positive

1)
A = 64'b0100000001101001000100000000000000000000000000000000000000000000
B = 64'b0100000000101000010110100001110010101100000010000011000100100111
C = 64'b0100000001101010100101011010000111001010110000001000001100010010
(expected)
C= 64'b0100000001101010100101011010000111001010110000001000001100010010

Negative + negative

2)
A = 64'b1100000001101001000100000000000000000000000000000000000000000000;
B = 64'b1100000000101000010110100001110010101100000010000011000100100111;
C = 64'b1100000001101010100101011010000111001010110000001000001100010010
(expected)
C=64'b1100000001101010100101011010000111001010110000001000001100010010

Positive + Negative

3) A= 64'b0100000001101001000100000000000000000000000000000000000000000000;
B = 64'b1100000000101000010110100001110010101100000010000011000100100111;
C=64'b0100000001100111100010100101111000110101001111110111110011101110
(expected)
C=64'b0100000001100111100010100101111000110101001111110111110011101110

Negative + Positive

4) A= 64'b1100000001101001000100000000000000000000000000000000000000000000;
B = 64'b0100000000101000010110100001110010101100000010000011000100100111;
C=64'b1100000001100111100010100101111000110101001111110111110011101110
(expected)
C=64'b1100000001100111100010100101111000110101001111110111110011101110

-X + +X

5) A= 64'b1100000001101001000100000000000000000000000000000000000000000000;
B = 64'b0100000001101001000100000000000000000000000000000000000000000000;
C=64'b0000000000000000000000000000000000000000000000000000000000000000
(expected)
C=64'b0000000000000000000000000000000000000000000000000000000000000000
//0

+Infinity + X

6) A= 64’b0111111111110000000000000000000000000000000000000000000000000000;
B = 64'b0100000001101001000100000000000000000000000000000000000000000000;
C=64'b0111111111110000000000000000000000000000000000000000000000000000
(expected)
C=64'b0111111111110000000000000000000000000000000000000000000000000000
//+Infinity

-Infinity + X

7) A= 64’b1111111111110000000000000000000000000000000000000000000000000000;
B = 64'b0100000001101001000100000000000000000000000000000000000000000000;
C=64'b1111111111110000000000000000000000000000000000000000000000000000
(expected)
C=64'b1111111111110000000000000000000000000000000000000000000000000000
//-Infinity

NAN + X

8) A= 64’b1111111111110000000000000000000000000000000000000000000000000001
B = 64'b0100000001101001000100000000000000000000000000000000000000000000
C=64'b0111111111111111111111111111111111111111111111111111111111111110
(expected)
C=64'b0111111111111111111111111111111111111111111111111111111111111110
//NAN

+Infinity + -Infinity

9) A= 64’b0111111111110000000000000000000000000000000000000000000000000000;
B = 64’b1111111111110000000000000000000000000000000000000000000000000000;
C=64'b0111111111111111111111111111111111111111111111111111111111111111
(expected)
C=64'b0111111111111111111111111111111111111111111111111111111111111111
//Cannot calculate