

本解答僅為正解範例，同學不用完全跟上面一樣

1.

(a)

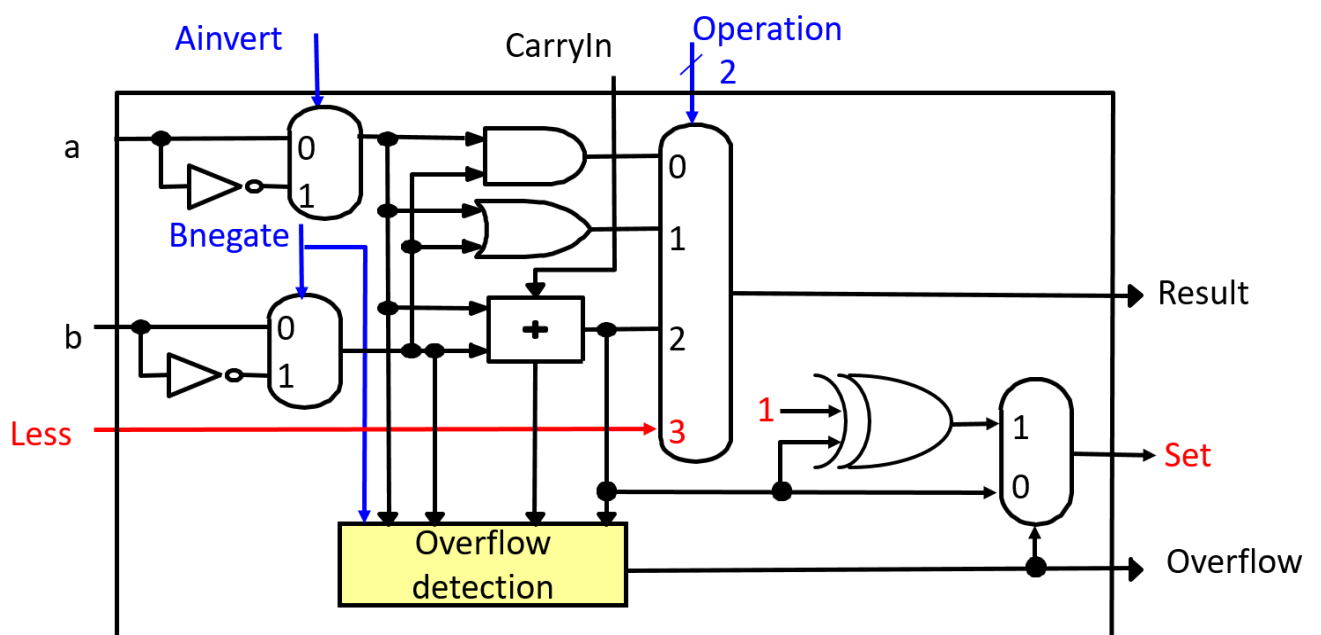
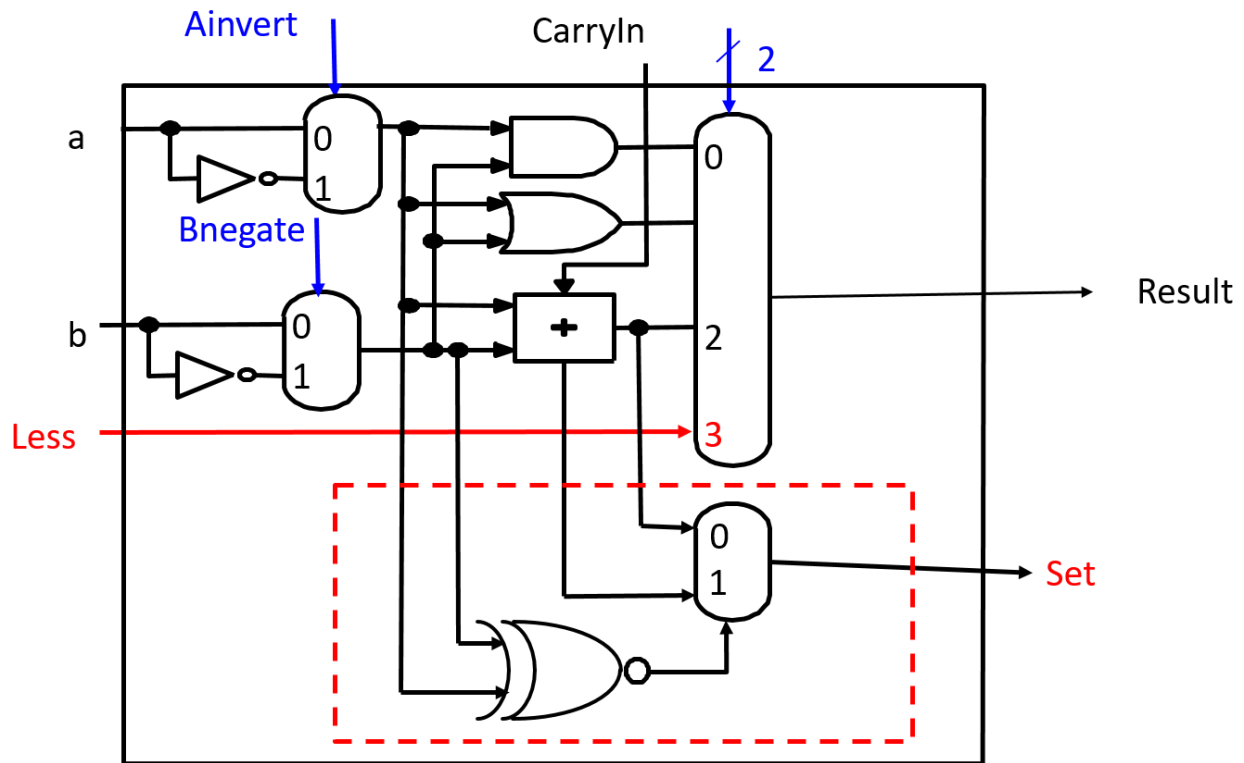
A = 1001

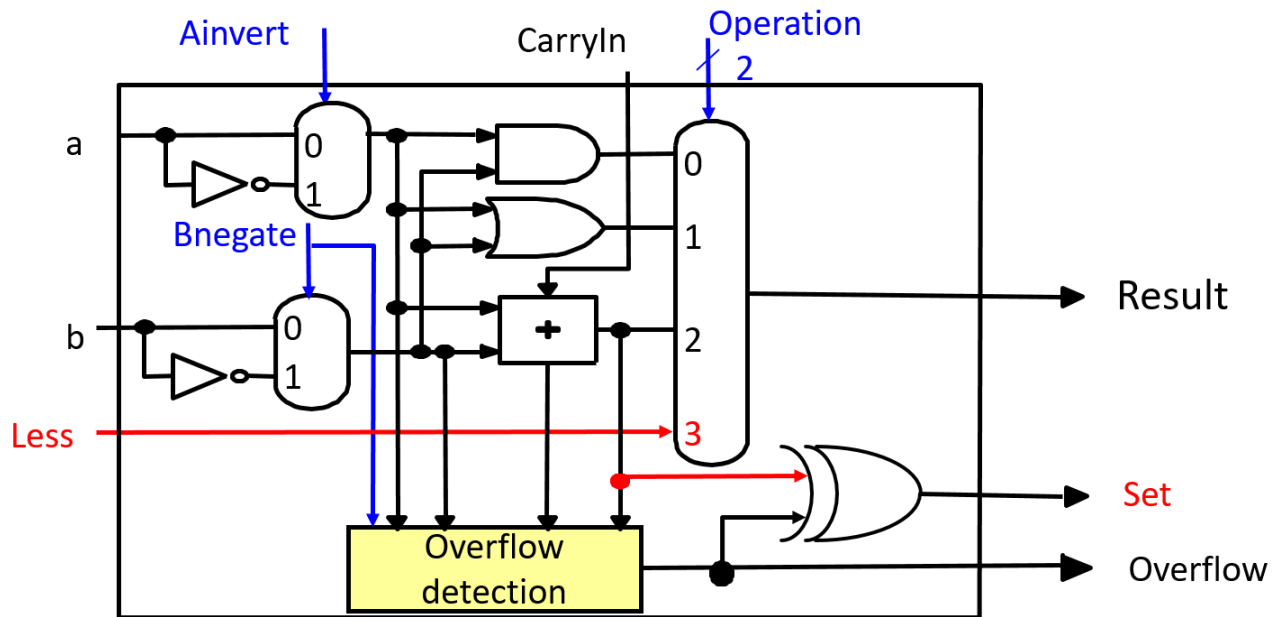
B = 0110

A < B => result=0000 , overflow=1

(b)

以下幾種方式都是正確的，同學可以自行比對真值表確認自己畫的是否正確。





carry_in	a	b	old_set	carry_out	overflow	new_set
0	0	0	1	0	0	1
1	0	0	0	1	0	0
0	1	0	0	1	1	1
1	1	0	1	1	0	1
0	0	1	0	0	0	0
1	0	1	1	0	1	0
0	1	1	1	0	0	1
1	1	1	0	1	0	0

2.

A. 0000000 11000 01001 001 01100 1100011

rs2 : 11000 -> x24

rs1 : 01001 -> x9

funct : 001

opcode : 1100011

immediate : 000000000110 ->6

Ans is: bne x9, x24, +12(6)

B. 0 00000011 00001001001011001100011

S : 0

Exponent : 00000011

Fraction : 00001001001011001100011

Ans is : $(2^{-5} + 2^{-8} + 2^{-11} + 2^{-13} + 2^{-14} + 2^{-17} + 2^{-18} + 2^{-22} + 2^{-23} + 1) * 2^{-124} = 4.8704936e-38$

3. (a)

$-0.39(10\text{進位}) = -0.01100011110101110001(2\text{進位}) = -1.100011110101110001(2\text{進位}) * 2^{-2}$

S : 1

Exponent : $-2+15 = 13 = 0b01101$

Fraction : 0b1000111101

Ans : 1011011000111101

(b)

$12.3456(10\text{進位}) = 1100.010110000111100101(2\text{進位}) = 1.100010110000111100101(2\text{進位}) * 2^3$

S : 0

Exponent : $3+15=18 = 0b10010$

Fraction : 0b1000101100

Ans : 0100101000101100

4. (a)

$a_0 = 1 * 1.0000000000(2\text{進位}) * 2^{-14}$

(b)

$a_1 = 1 * 0.1111111111(2\text{進位}) * 2^{-14}$

$a_2 = 1 * 0.1111111110(2\text{進位}) * 2^{-14}$

(c)

$a_0 - a_1 = 0.0000000001(2\text{進位}) * 2^{-14}$

$a_1 - a_2 = 0.0000000001(2\text{進位}) * 2^{-14}$

(d)

$a_0 = 1 * 1.0000000000(2\text{進位}) * 2^{-14}$

$a_1 = 1 * 0.1111111111(2\text{進位}) * 2^{-15}$

$a_2 = 1 * 0.1111111110(2\text{進位}) * 2^{-15}$

$a_0 - a_1 = 9.0000000001(2\text{進位}) * 2^{-15}$

$a_1 - a_2 = 0.0000000001(2\text{進位}) * 2^{-15}$

5. 00001101 / 0011

step	Remainder	Divisor
0	0000 1101	0011
1.1	0001 1010	0011
1.2	1110 1010	0011
1.3b	0011 0100	0011
2.2	0000 0100	0011
2.3a	0000 1001	0011
3.2	1101 1001	0011
3.3b	0001 0010	0011
4.2	1110 0010	0011
4.3b	0010 0100	0011
Done	0001 0100	0011