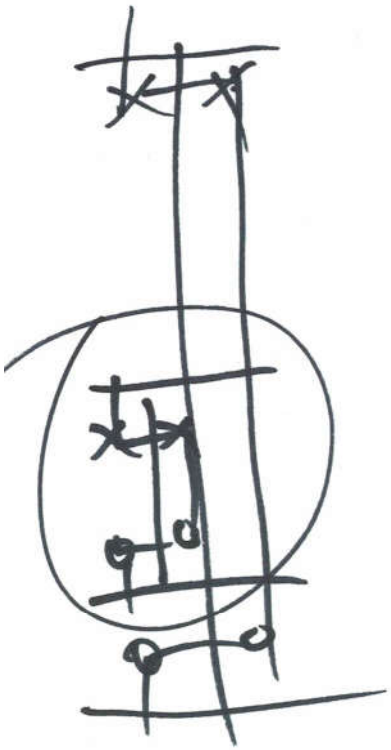
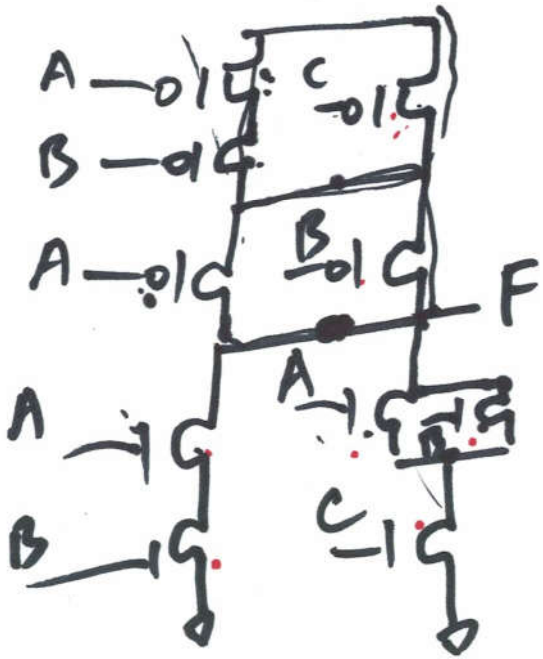
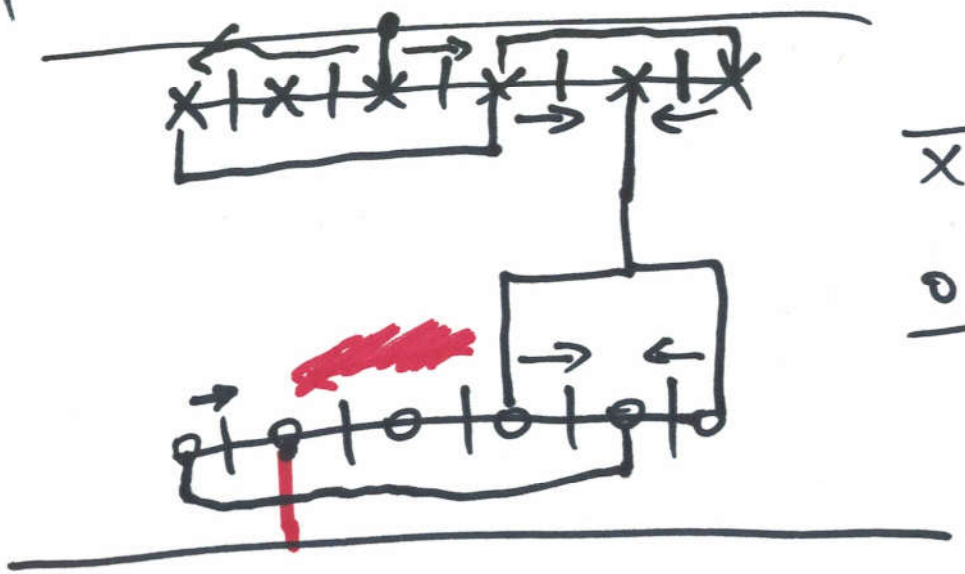
$$F = \overline{(AB+AC+BC)} = \overline{AB+(A+B).C}$$



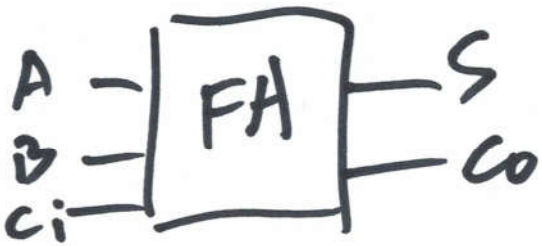


A	B	C	F
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

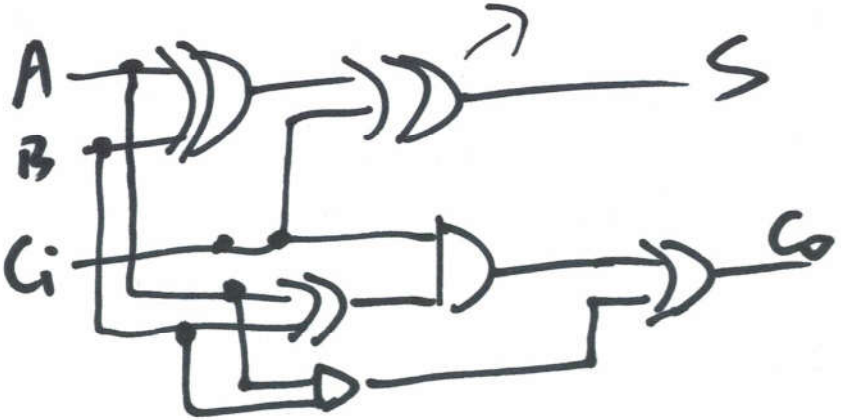


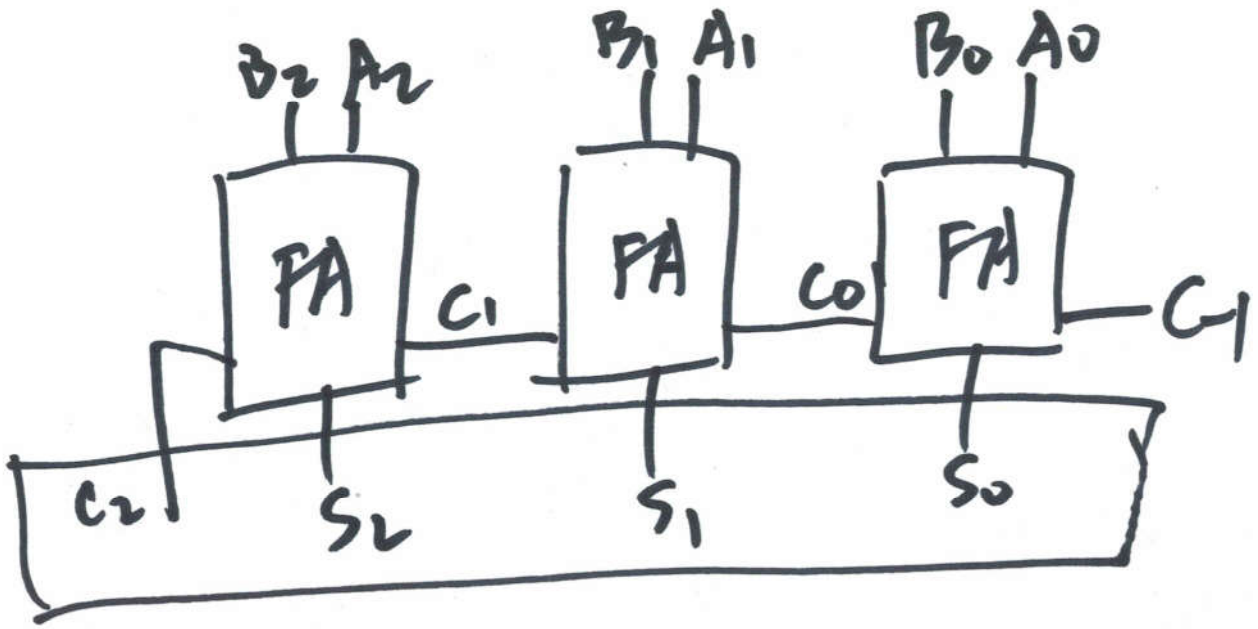
X	X
0	0

FAC Full Adder)



$$\begin{cases} S = A \oplus B \oplus C \\ C_o = (A+B)C_i + AB \end{cases}$$





2's complement: invert all the bits and add one to the result

0101 5

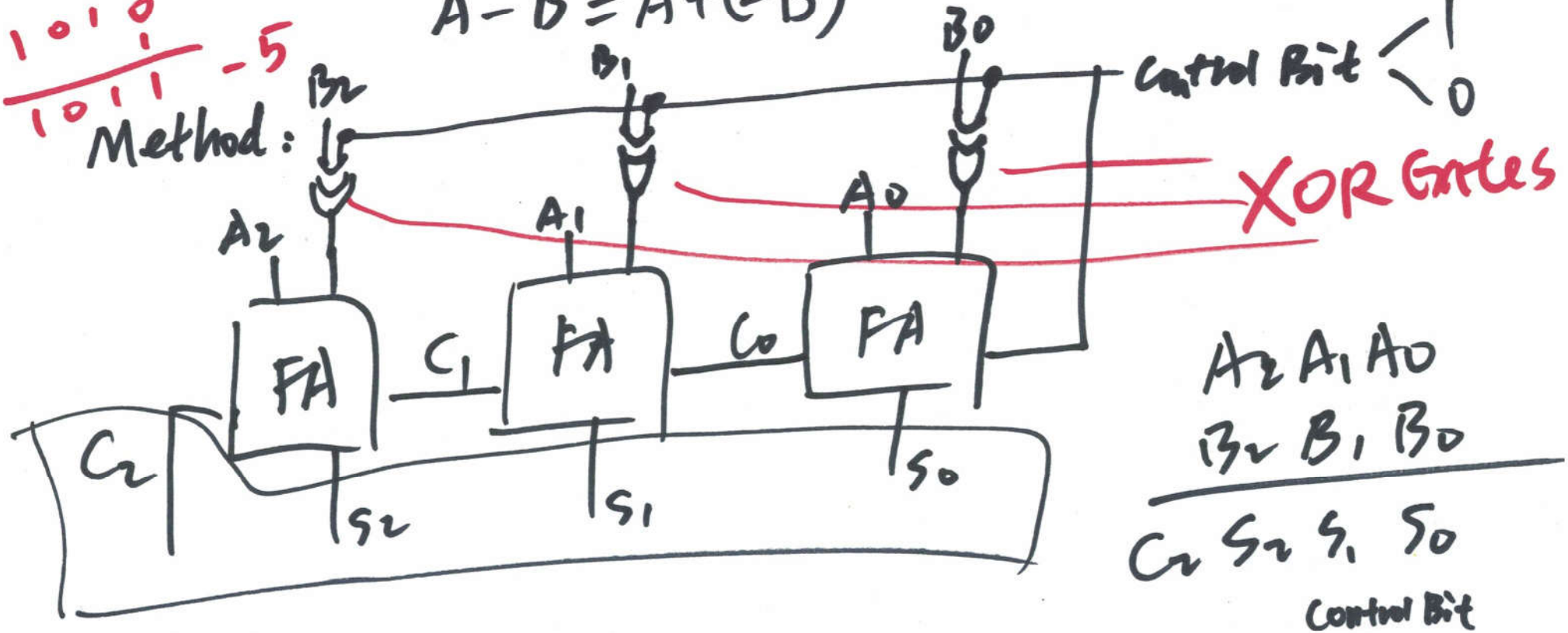
1010

1

1011 -5

$A - B = A + (-B)$

Method:



$A_2 A_1 A_0$

$B_2 B_1 B_0$

$C_2 S_2 S_1 S_0$

Control Bit

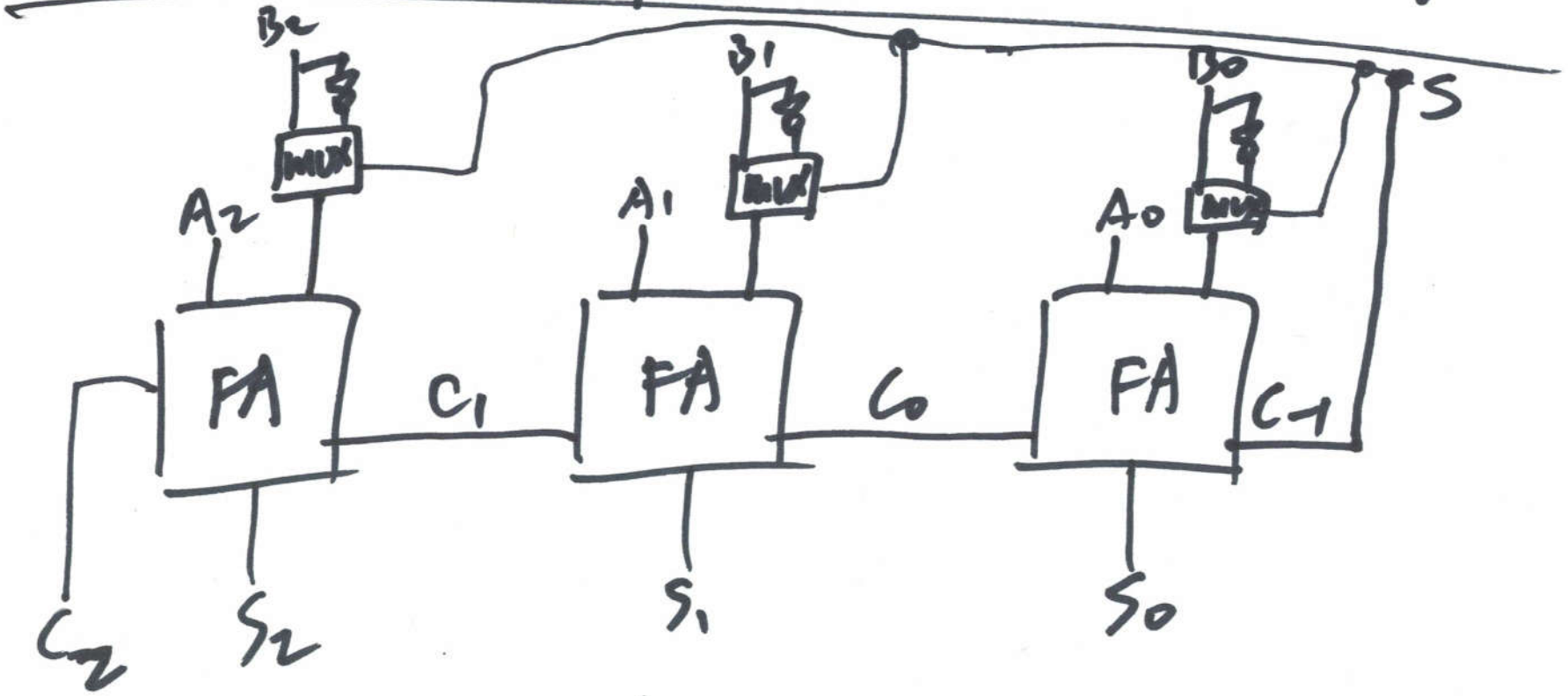
$B \begin{cases} 0 \oplus 0 = 0 \\ 1 \oplus 0 = 1 \end{cases}$

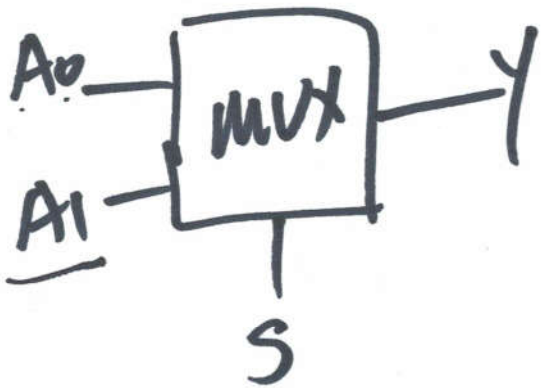
$B \oplus 1 = \bar{B}$

$0 \oplus 1 = 1$

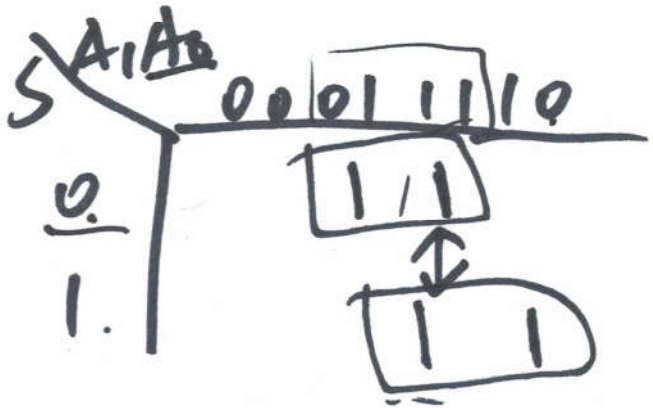
$1 \oplus 1 = 0$

Use a MUX to implement the subtractor's logic





S	A1	A0	Y
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1



$$Y = \bar{S} A_0 + S A_1$$