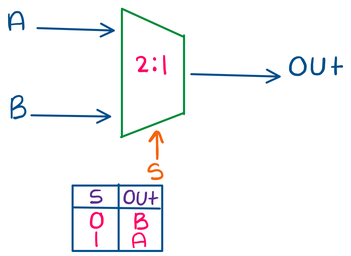
Prelab 4

Saturday, February 15, 2025 5:02 PM

QUESTION 2:



S	OUT
0	B
1	A

A	B	S	OUT
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

K-Map:

AB \ S	0	1
00		
01	1	
11	1	1
10		1

$B\bar{S} + AS$

Circuit For 2:1

QUESTION 4:

C0	C1	OP
0	0	AND
0	1	AND
1	0	ADD
1	1	SUB

OP = C0 · C1 (AND)

0 0 1 1

QUESTION 1:

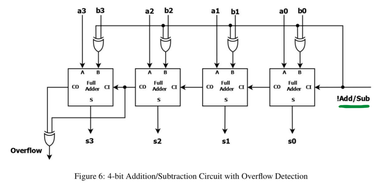


Figure 6: 4-bit Addition/Subtraction Circuit with Overflow Detection

ADDITION: !Add / Sub = 0

A: $a_3\ a_2\ a_1\ a_0$

B: $b_3\ b_2\ b_1\ b_0$ +

C $S_3\ S_2\ S_1\ S_0$

Example: $[8 + 4 = 12]$ $1000 + 0100 = 1100$ C = 0, S3 = 1, S2 = 1, S1 = 0, S0 = 0

SUBTRACTION: !ADD / Sub = 1

A: $a_3\ a_2\ a_1\ a_0$

B: $b_3\ b_2\ b_1\ b_0$ + 1 (-B)

C $S_3\ S_2\ S_1\ S_0$

Example $[8 - 4 = 4]$ $1000 + 1011 + 1 = 10100$ CO = 1, S3 = 0, S2 = 1, S1 = 0, S0 = 0

QUESTION 3: