

# lab 4

## #Task 1 Half Adder

$$\begin{array}{r} A \\ + B \\ \hline C_0 S \end{array}$$

A	B	C <sub>0</sub>	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

$$C_0 = AB$$

$$S = A \oplus B$$

#1 XOR

#1 AND2

## #Task 2 Full Adder

$$\begin{array}{r} A \\ B \\ + C_i \\ \hline C_0 S \end{array}$$

A	B	C <sub>i</sub>	C <sub>0</sub>	S
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

$$C_0 = AB + (A \oplus B)C_i$$

$$S = (A \oplus B) \oplus C_i$$

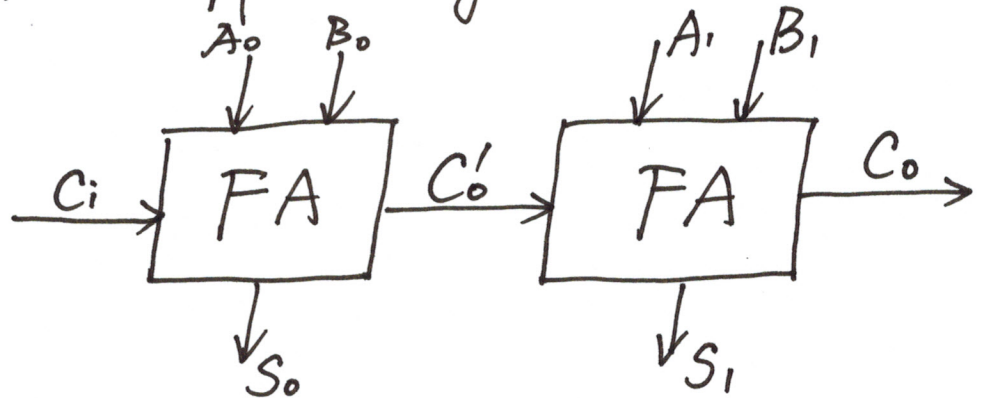
#2 XOR

#2 AND2

#1 OR2

## #Task 3 2-bit Ripple Carry Adder

$$\begin{array}{r} A_1 A_0 \\ B_1 B_0 \\ + C_i \\ \hline C_0 S_1 S_0 \end{array}$$



#4 XOR

#4 AND2

#2 OR2