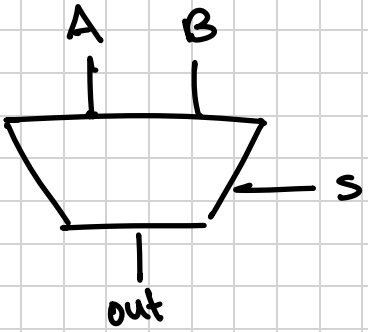
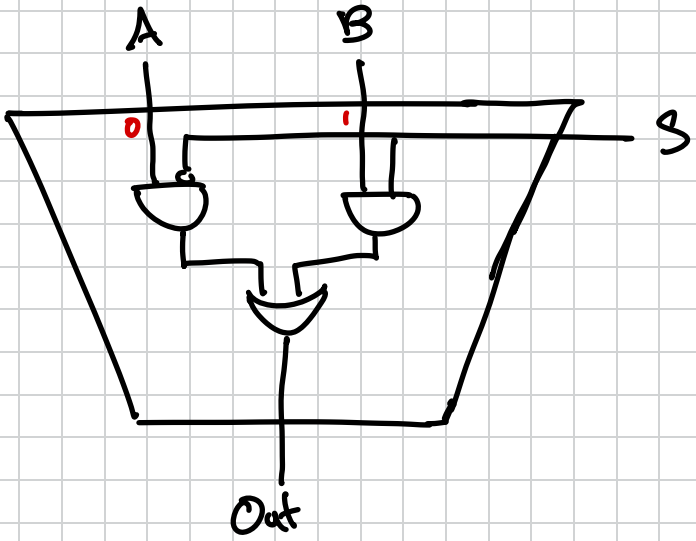
Mux



if $s=0$ then out $= A$

if $s=1$ then out $= B$

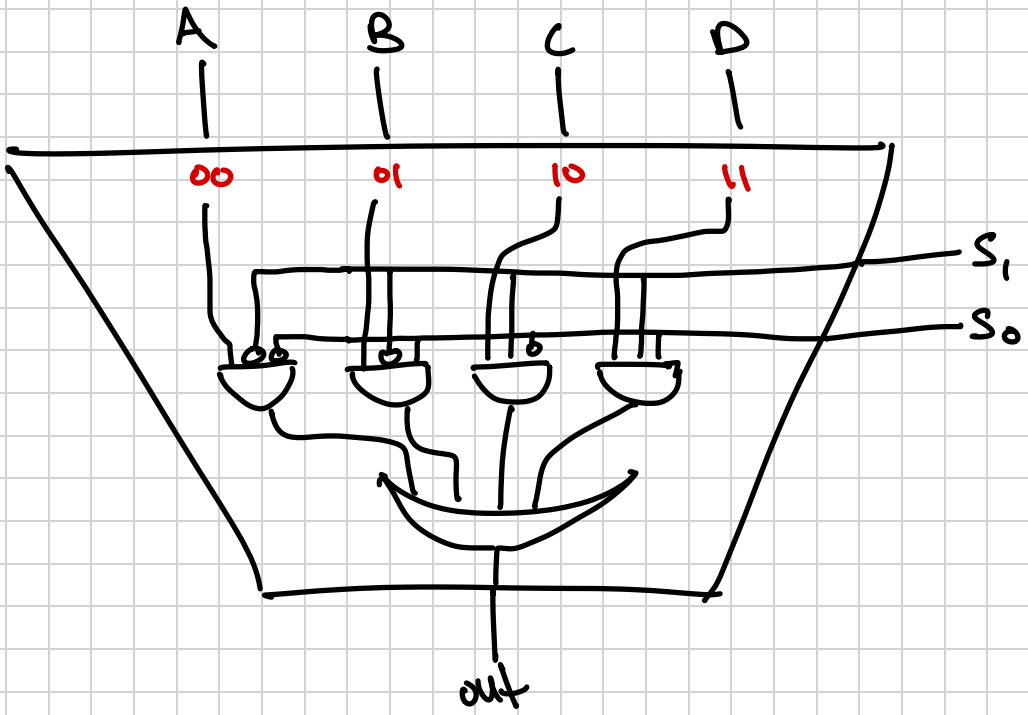


A	B	S	out
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

$A'BS + AB'S' + ABS' + ABS$

$BS(A' + A) + AS'(B' + B)$

$BS + AS'$



"Vending Machine" - Retrieves value based on key

Design Process

System Description

↓

Truth Table

↓

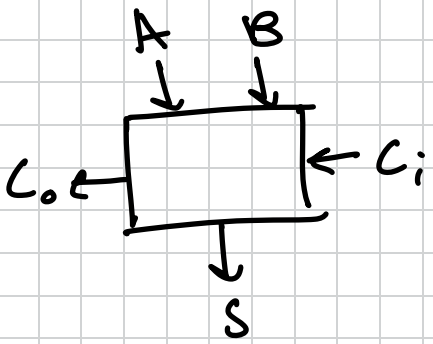
Boolean Expressions

↓

Logic Circuit

Programmable Logic Array

Adder 1-bit

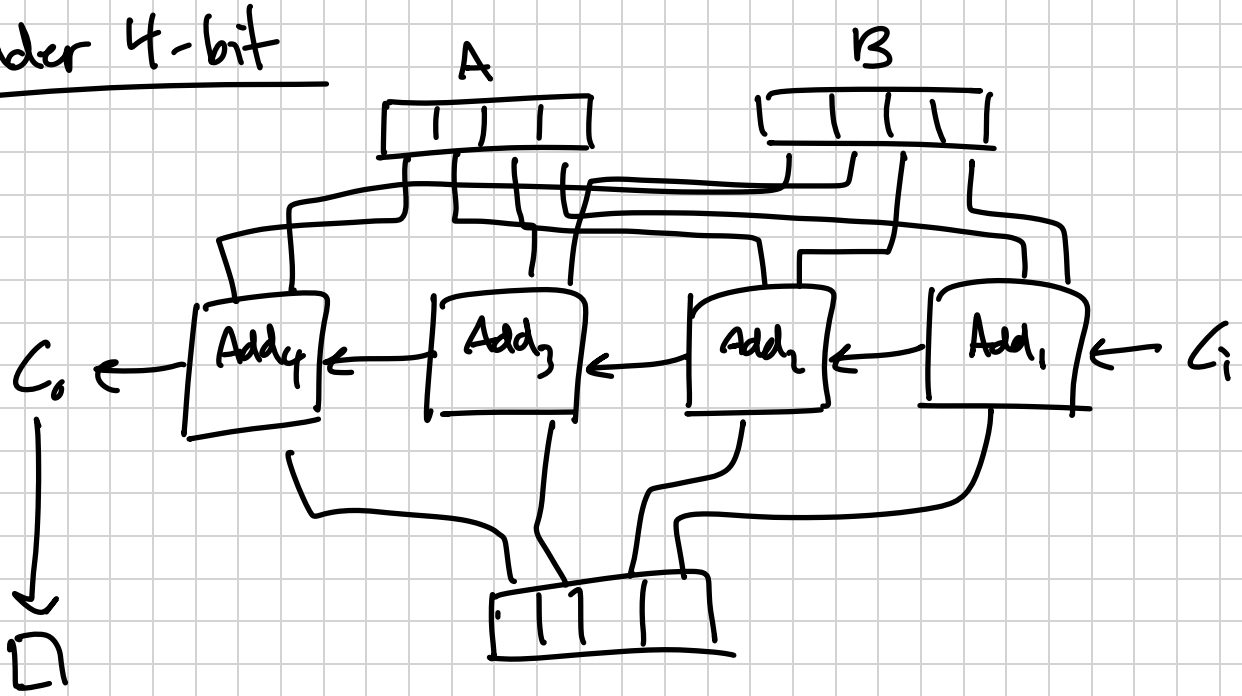


A	B	C_i	S	C_o
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

SOP S:

$A'B'C_i + A'BC_i' + AB'C_i' + ABC_i$

SOP C_o:

$A'BC_i + AB'C_i + ABC_i' + ABC_i$

Adder 4-bit