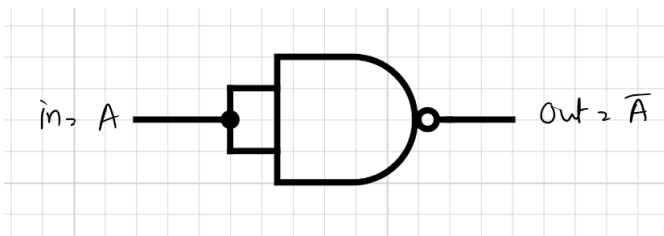


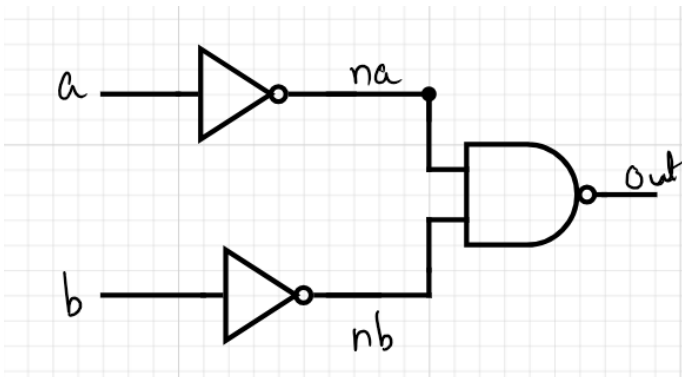
Project 1

Basic Gates – Given only Nand gate make other basic gates.
Once a gate is implemented you can use it to make other gates.

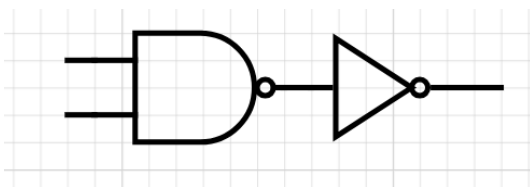
Not Gate



OR Gate

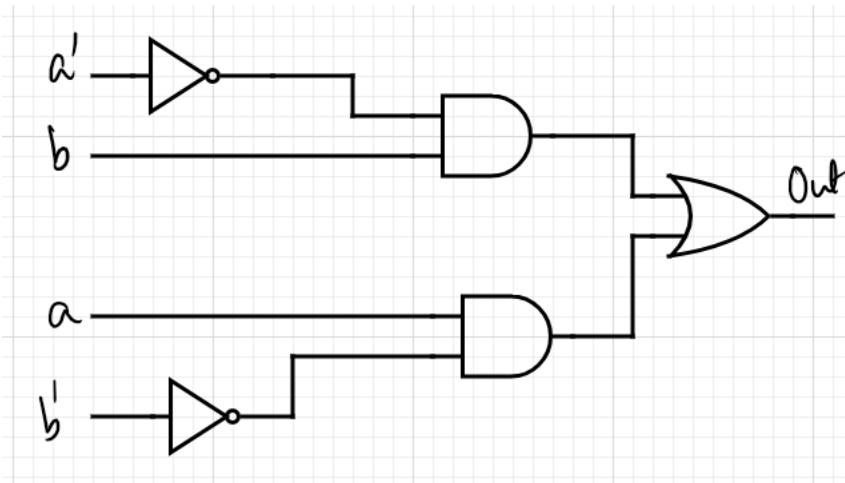


And Gate

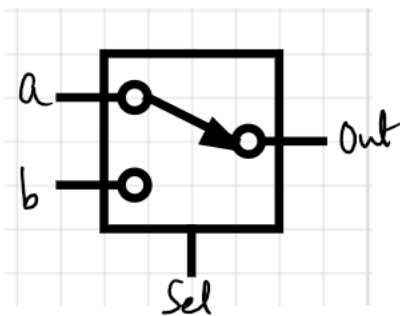


XOR Gate

$$A \oplus B = A'B + AB'$$

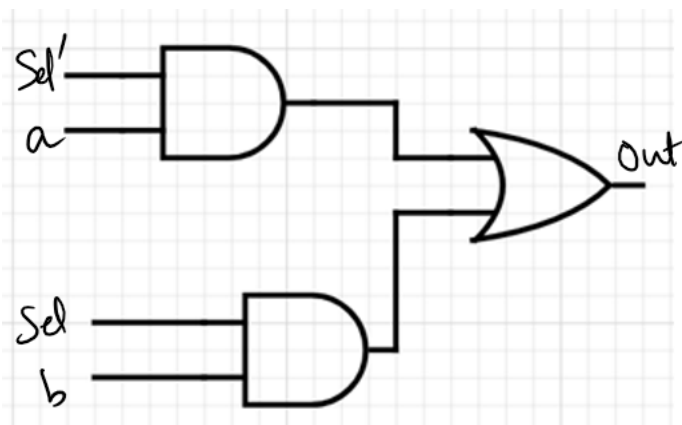


MUX (2 x 1)

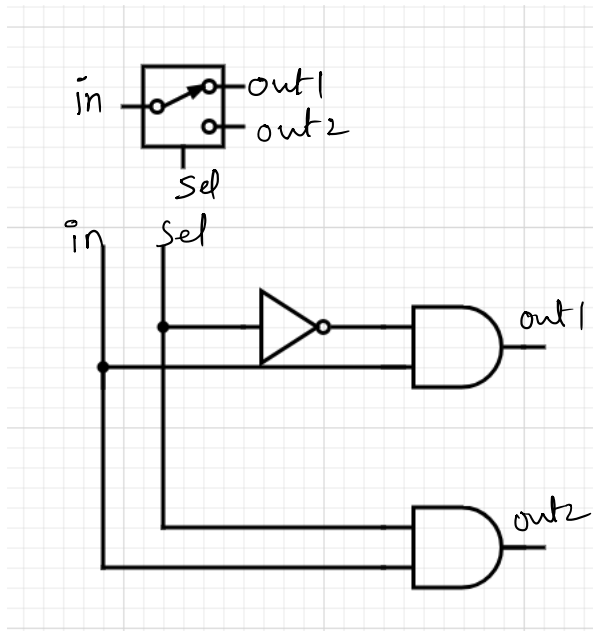


Sel	Out
0	a
1	b

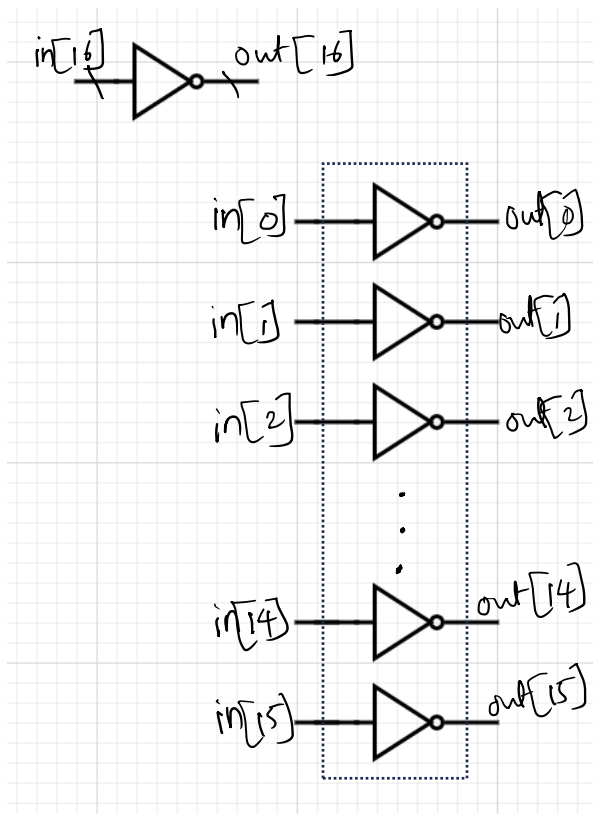
$$Out = Sel' \cdot a + Sel \cdot b$$



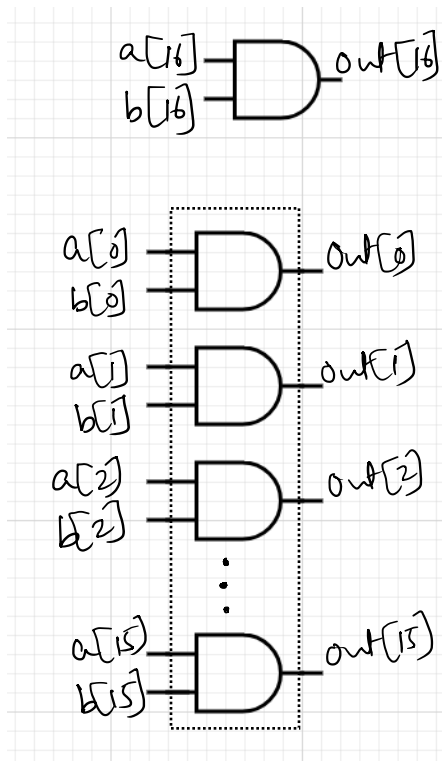
DMUX (1 x 2)



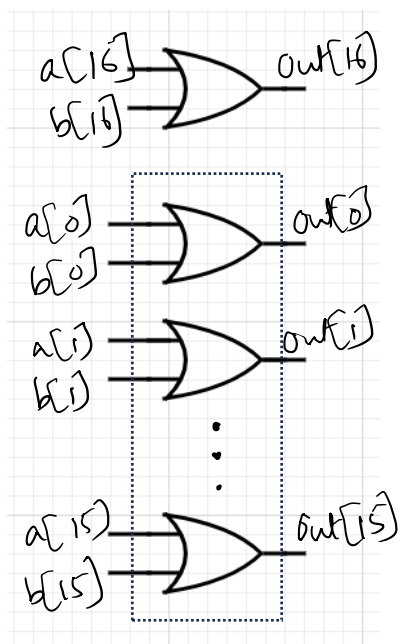
Not16(16 bit Not gate)



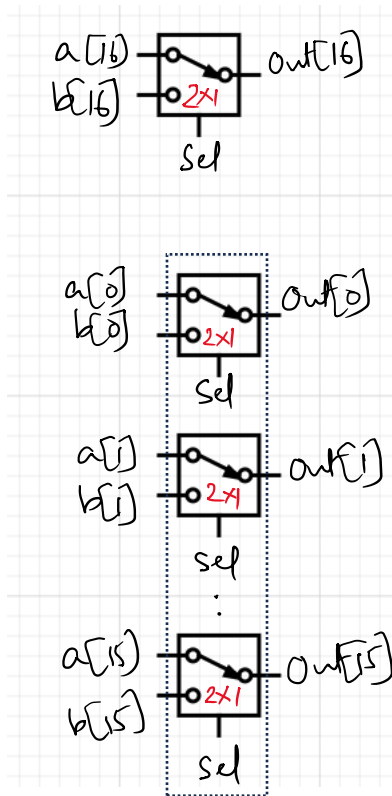
And16



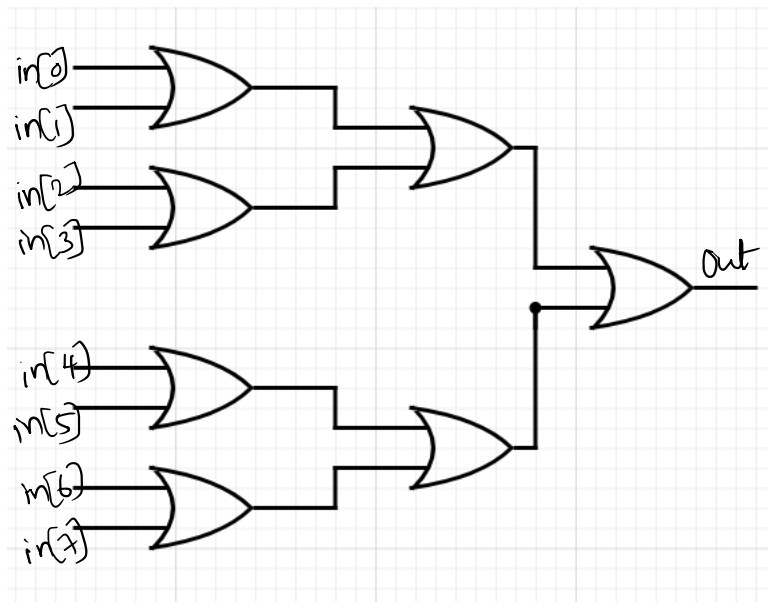
Or16



Mux16

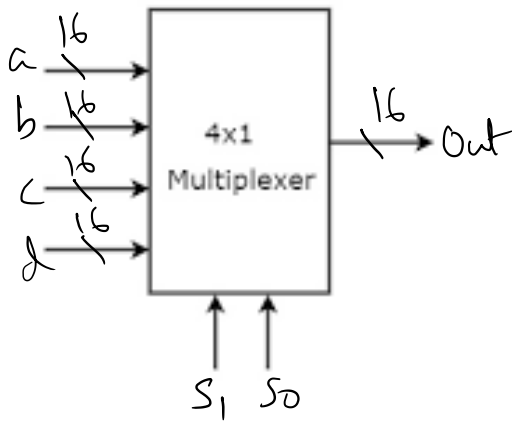


Or8Way



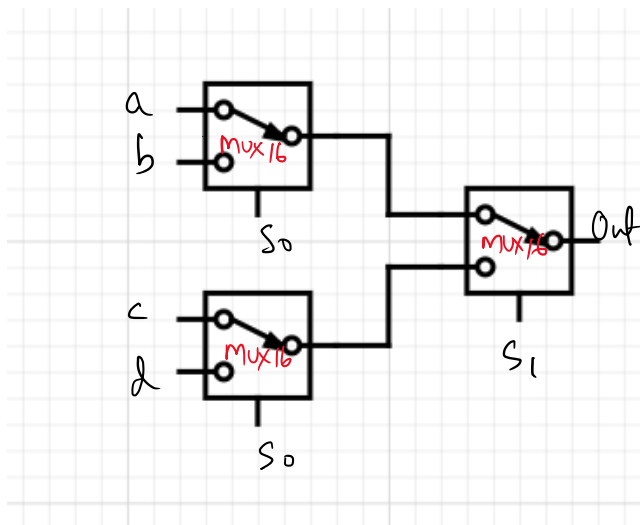
$in[8], out$
 $out = in[0] \text{ or } in[1] \text{ or } \dots in[7]$

Mux4Way16



$$4 \times 1 : 4 \text{ I/Os}$$

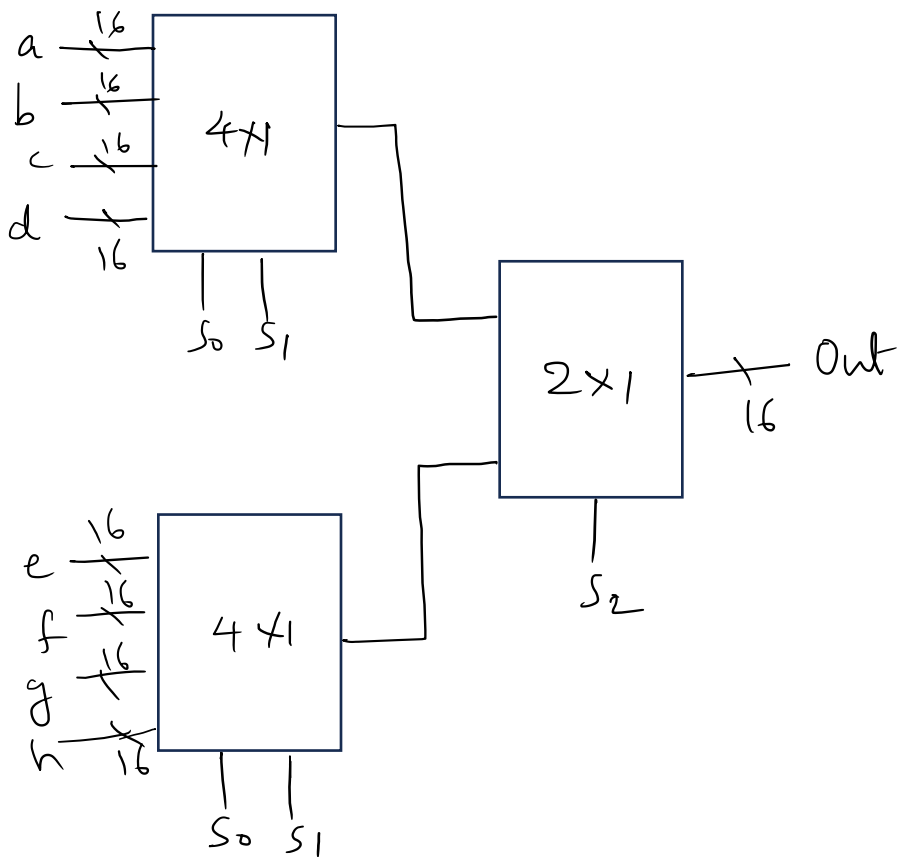
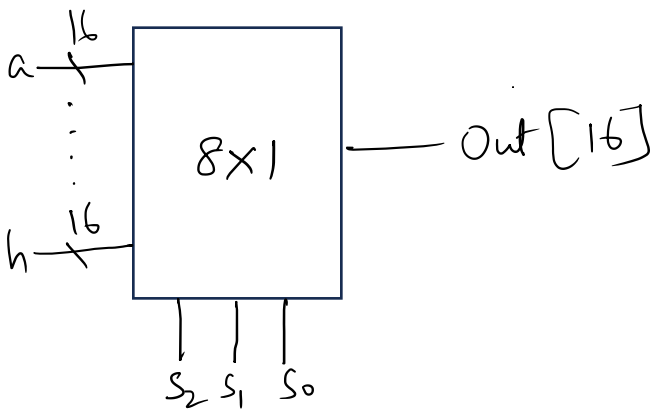
$$2 \times 1 : 2 \text{ I/Os}$$



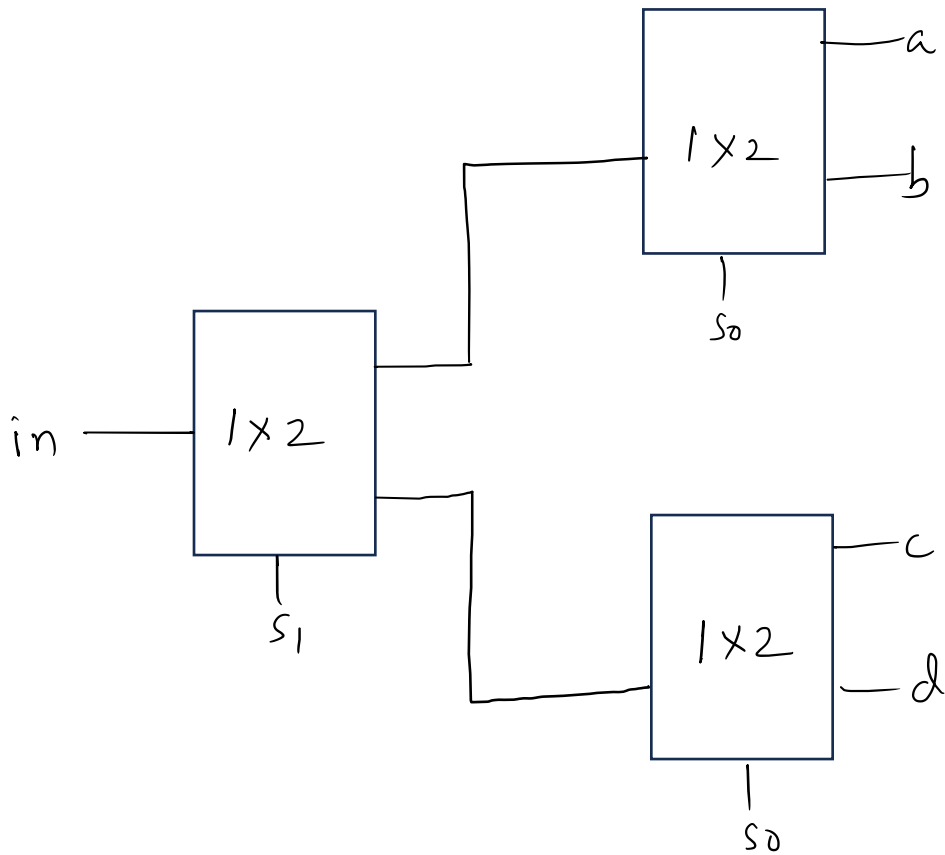
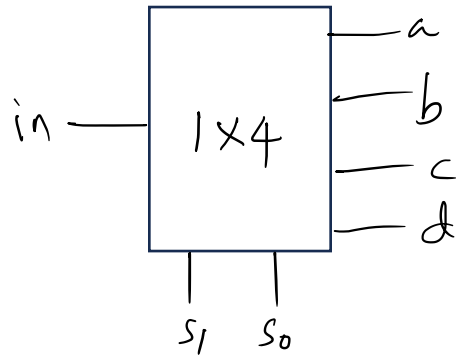
$$\frac{4}{2} = 2 \quad \frac{2}{2} = 1$$

⇒ 2 + 1 = 3, 2x1
mux are required.

MUX8way16



DMUX4Way



DMUX8Way

