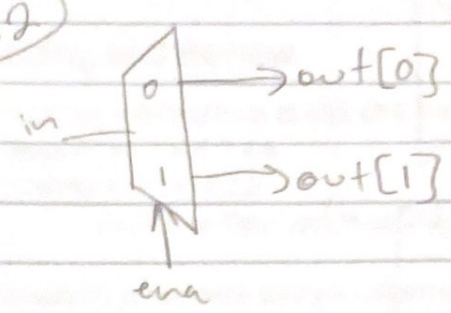
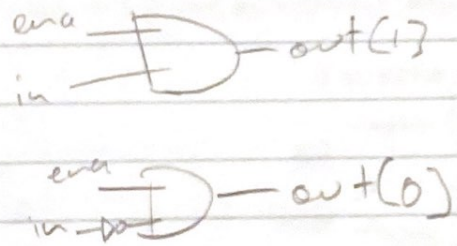
3 to 8 decoder:

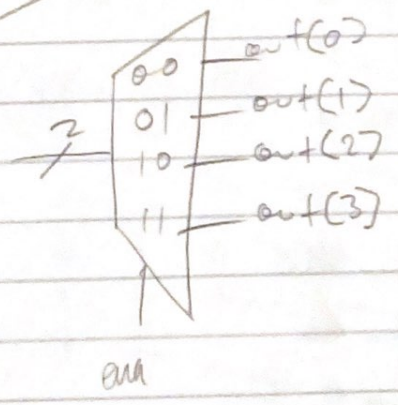
1:2



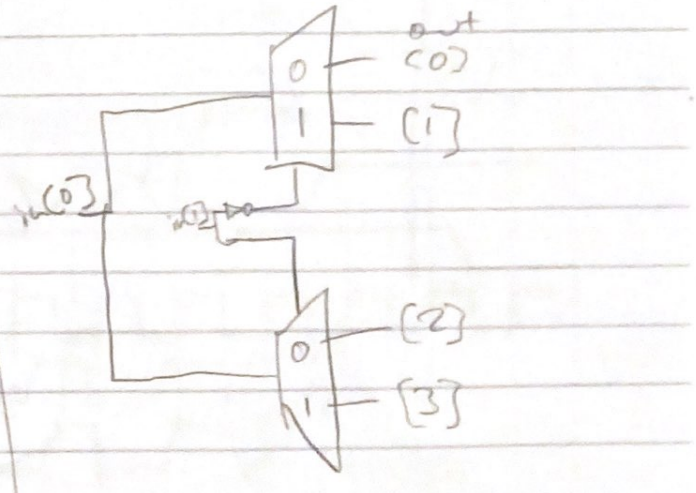
ena	in	out [1]	out [0]
1	0	0	1
1	1	1	0
0	X	0	0



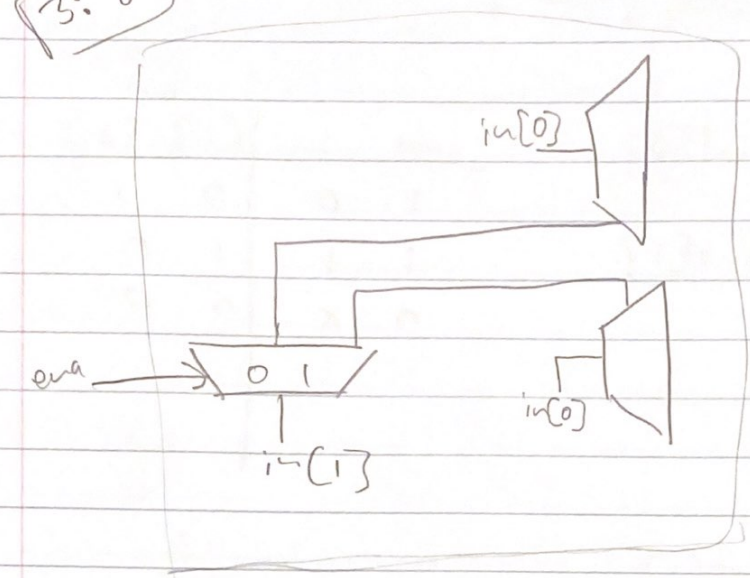
2:4

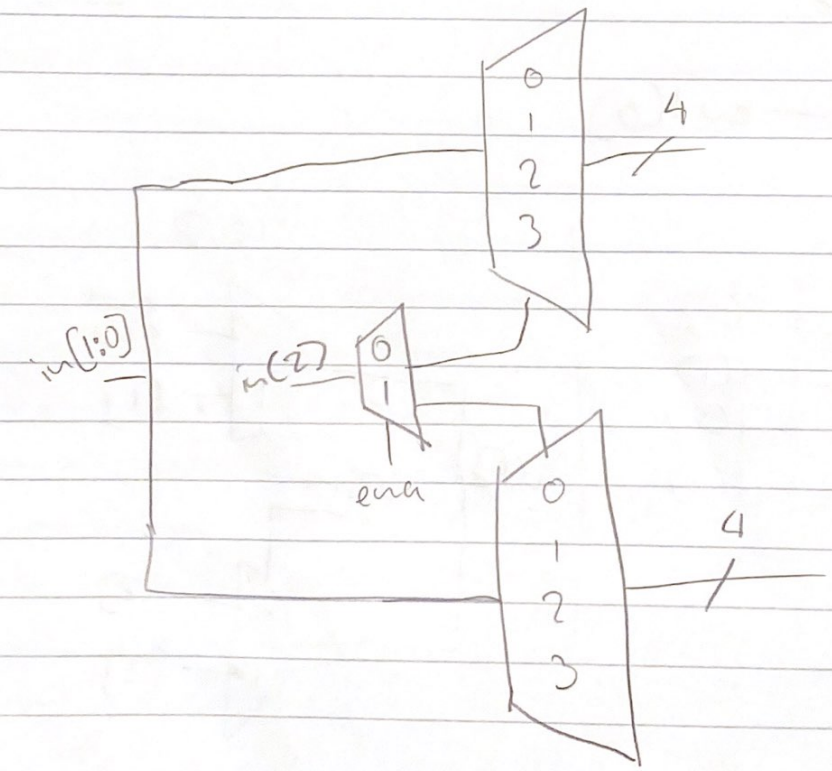


1:2

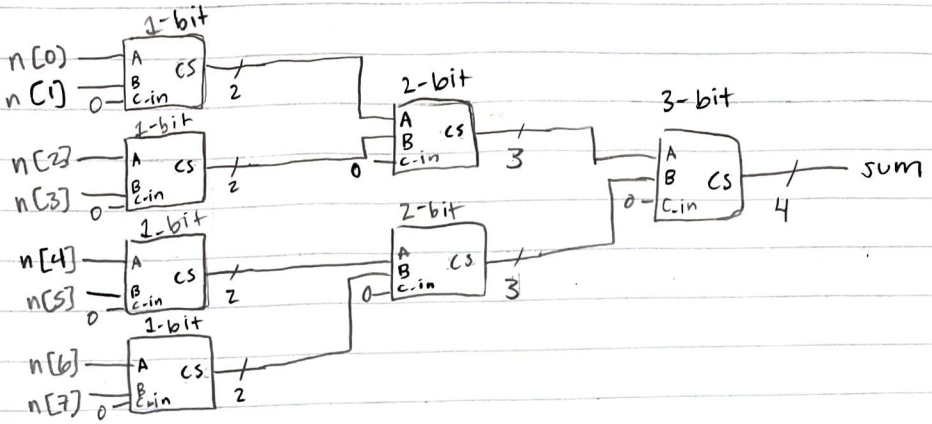


3:8





Hamming Weight of an 8-bit number



n[7:0] → neighbor cells

CS → The carry and sum. We defined the LSBs as the sum and the MSB as the carry.

after

↳ check to see if sum is exactly 3 or exactly 2.

ternary operator to define state_d based on state_q.

Flip Flop to update state_q based on rst and ena