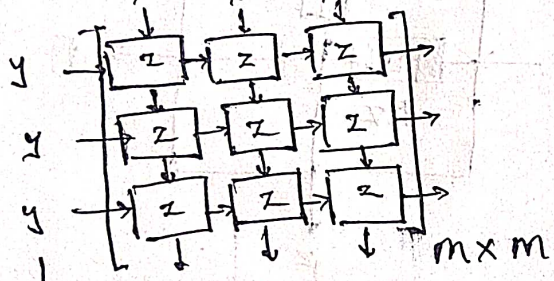
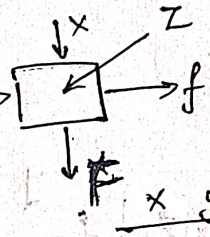
2/4/2024

* Mesh array → 0



fixed as 1

$x \leq y$



x	y	z	f
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	X
1	0	1	X
1	1	0	1
1	1	1	1

$f_0 = xy + yz$

$f_1 = M(x_1, y_1, z_1)$

$f_2 = xz' + yz$ (mux)

$f_3 = x + yz$

f_0	f_1	f_2	f_3
0	0	1	1
0	1	0	1

★ 4×5 Akers array

	0	0	0	0	0
1	C_{11} 1	C_{12} 0	C_{13} 0	C_{14} 1	C_{15} 0
1	C_{21} 0	C_{22} 0	C_{23} 1	C_{24} 1	C_{25} 1
1	C_{31} 1	C_{32} 1	C_{33} 0	C_{34} 1	C_{35} 0
1	C_{41} 0	C_{42} 1	C_{43} 1	C_{44} 0	C_{45} 1 → output

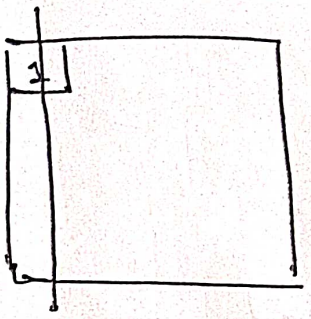
output
$C_{11} \rightarrow 1$
$C_{12} \rightarrow 1$
$C_{13} \rightarrow 1$
$C_{1n} \rightarrow 1$

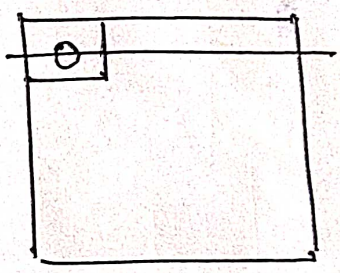
★OR

A	B	C	D'
B	C	D	A'
C	D'	A'	B'
D	A'	B'	C'

(4 variables)

★eliminate column





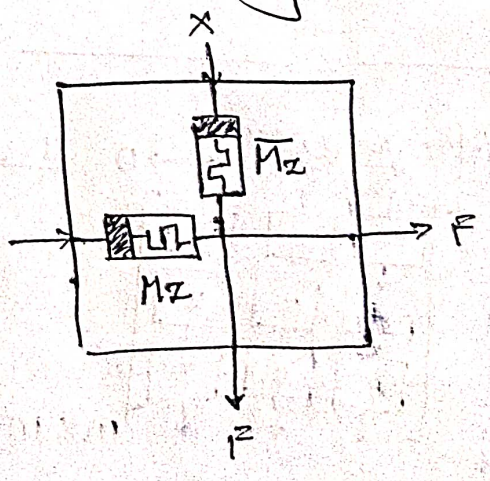
★eliminate row

3/4/2024

★ Sorting using Akers array (2 bit nos)

Z_0	Z_1	Z_2	Z_3 → P_3
Z_1	Z_2	Z_3 → P_2	
Z_2	Z_3 → P_1		
Z_3 → P_0			

★ Akers cell using memristor



yz \ x	00	01	11	10
0	0	0	1	0
1	1	0	1	1

$F = x\bar{z} + yz$

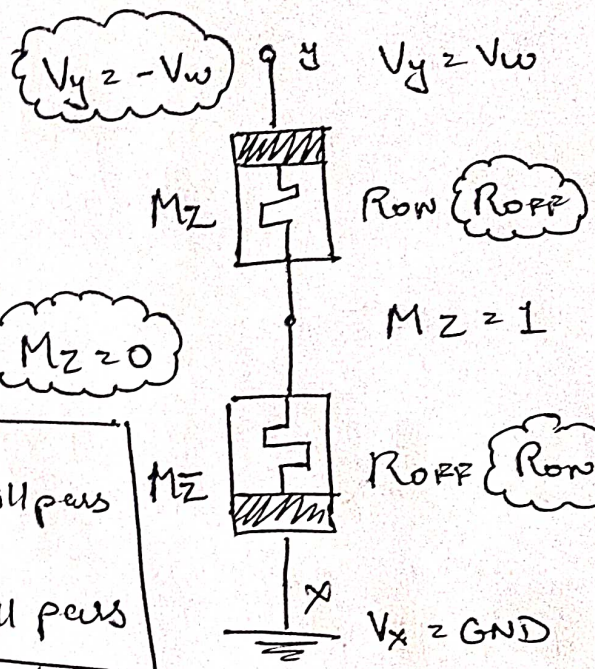
x y z	M	f
0 0 0	Roff	0
0 0 1	Ron	0
0 1 0	Roff	0
0 1 1	Ron	1
1 0 0	Roff	1
1 0 1	Ron	0
1 1 0	Roff	1
1 1 1	Ron	1

CLM

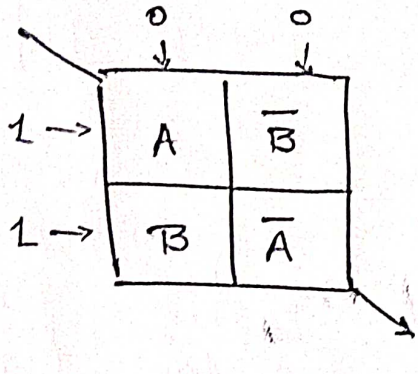
3/4/2024

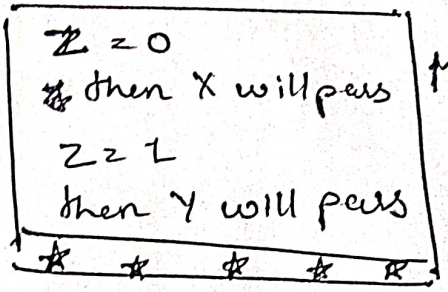
Stage I : write to cell M_Z / $M_{\bar{Z}}$

Stage II : Boolean fn (read)



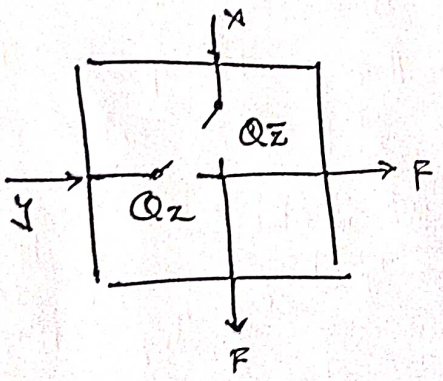
★ Realizing XOR with memristor Aikers cell





9/4/2024

★ QCA based Aker's array

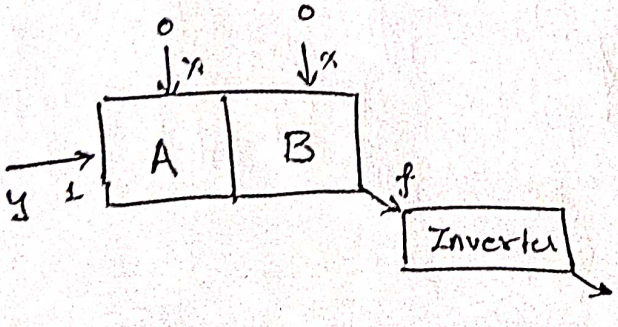


Q_Z → QCA flip flop

$Q_Z = 0$, x will pass

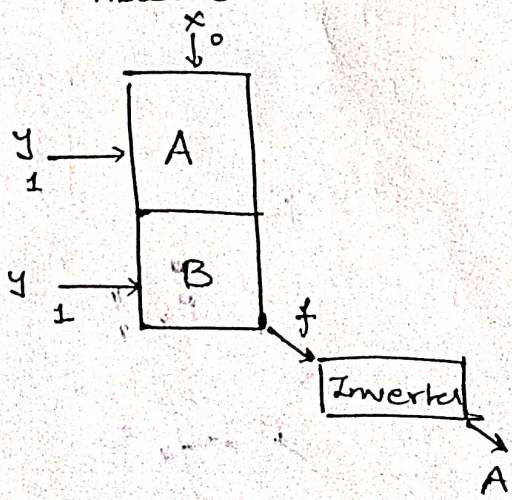
$Q_Z = 1$, y will pass

★ QCA Aker's NAND



A NAND B

★ QCA Aker's NOR



A NOR B