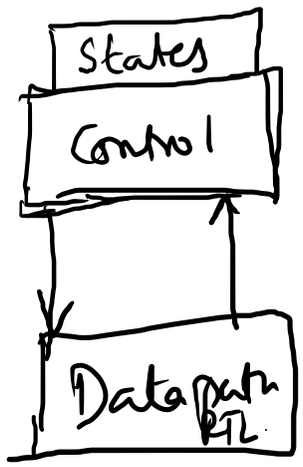
FSMs:

1. Design the problem with simple words.
2. Encode binary (similar) value to the states
3. State Table
4. K-maps for expressions
5. Logic diagram

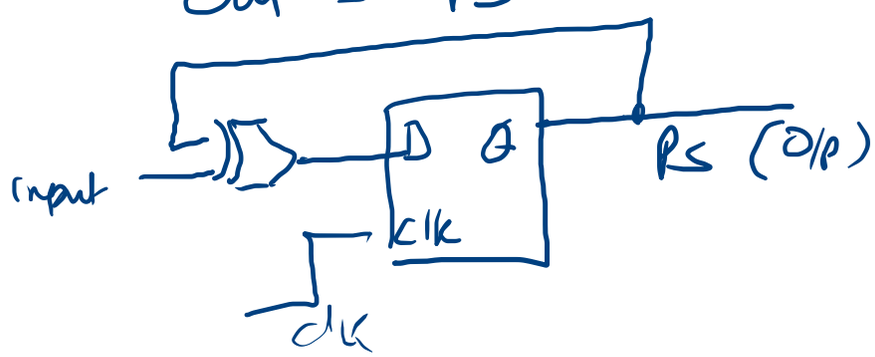


Odd parity checker: ← 01 ← no of ones is odd then you signal '1' as a flag otherwise '0'.

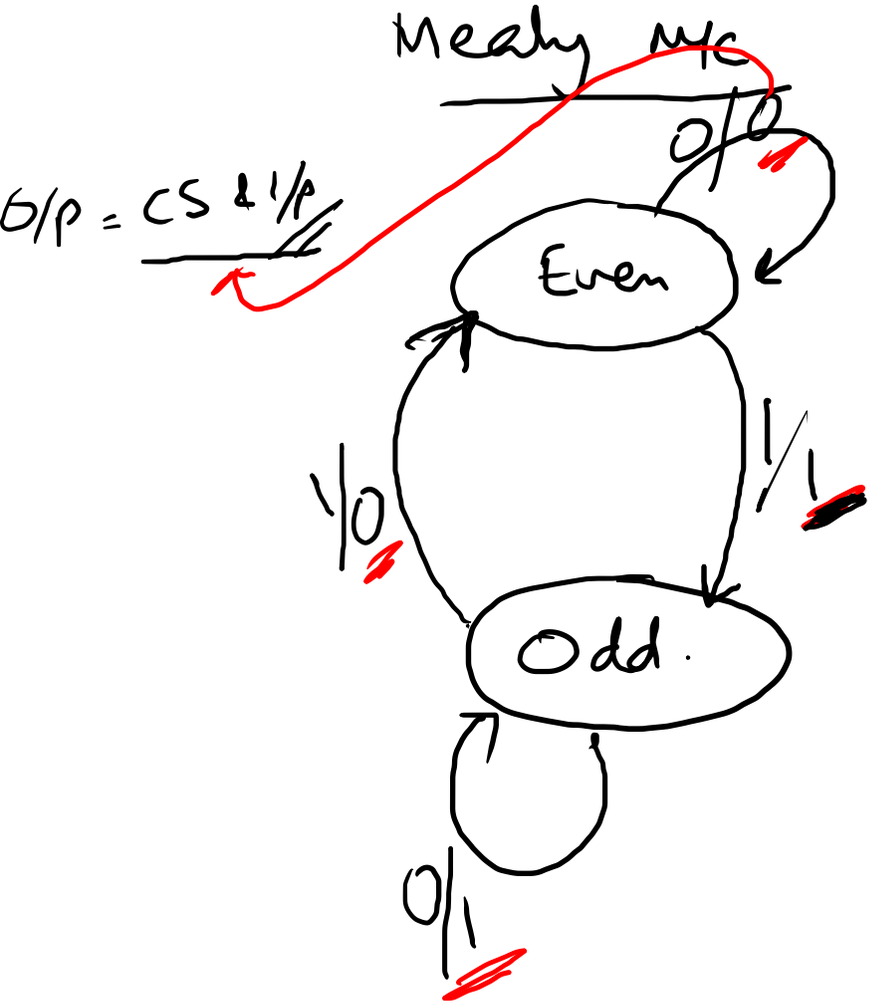
PS	PS	Input	NS	O/p
0	Even	0	Even 0	0
0	Even	1	Odd 1	0
1	Odd	0	Odd 1	1
1	Odd	1	Even 0	1

Even = 0
Odd = 1
} Encode these states as 0 and 1

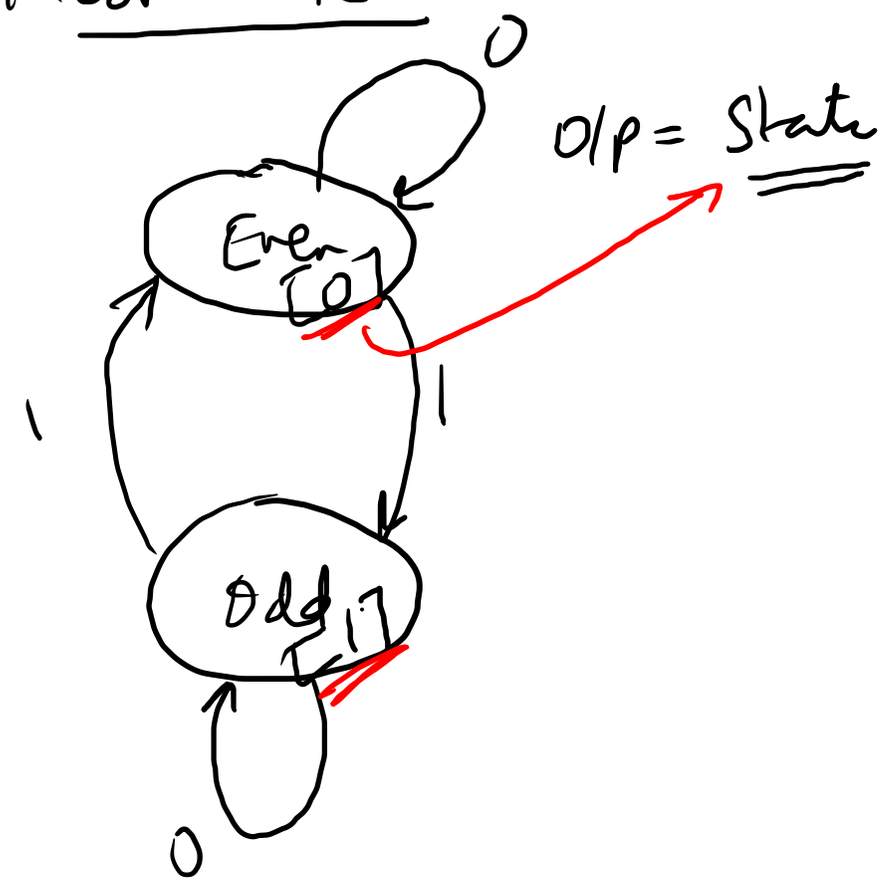
NS Equation:
NS = PS ⊕ Input
Out = PS



Mealy M/c



Moore M/c

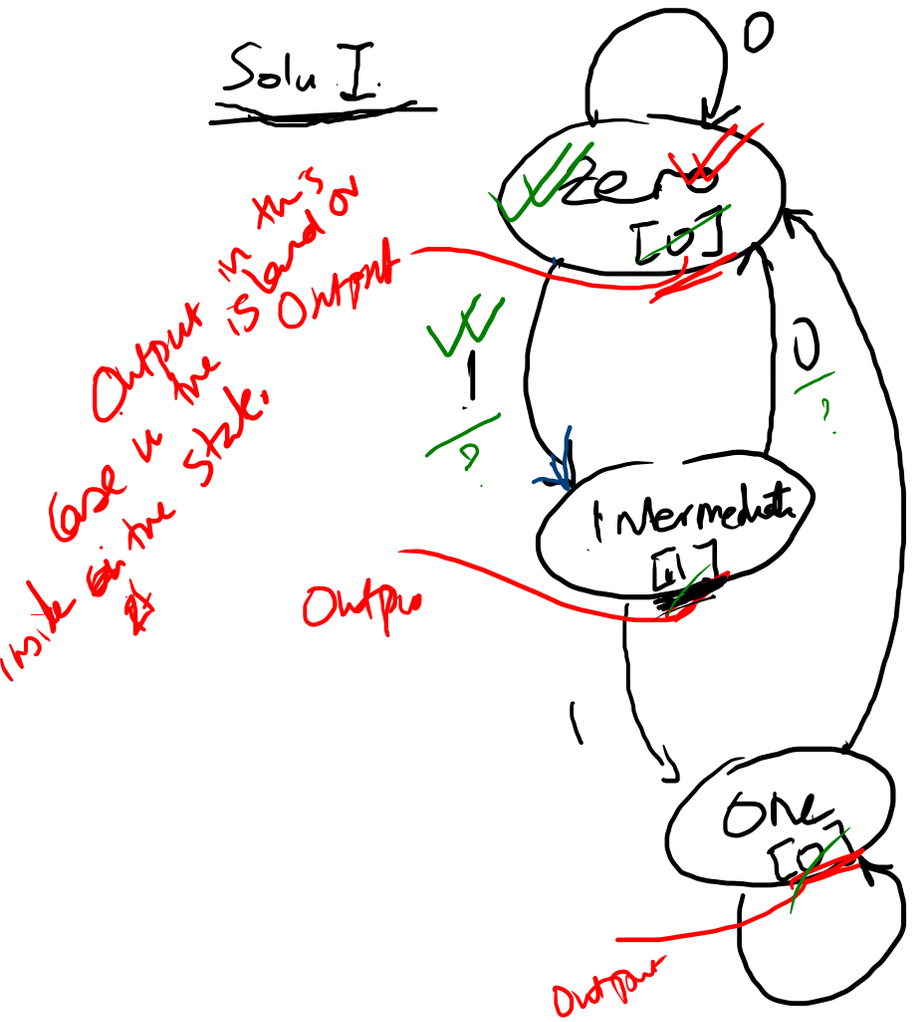


Edge Detector → L to R

0 0 0 1 0 1 0 1 1 0 0

O/p is 1 if the i/p bitstream changes from 0 & 1.

Solu I.



In	PS	NS (A B)	O/p
0	Zero 00	Zero 00	0
1	Zero 00	Int 01	0 (1)
0	Int 01	Zero 00	1
1	Int 01	One 11	0
0	One 11	Zero 00	0
1	One 11	One 11	0

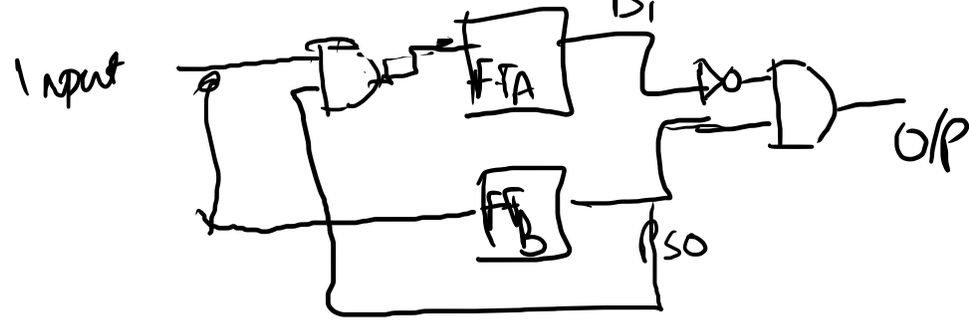
State Encode

$A = In \cdot PS_0$

$B = In$

$O/P = \overline{PS_1} \cdot PS_0$

This can be derived from the K-maps.



Soln II.

Soln I.

Moore
more states
Synchronous outputs
[o/p = f(states)]

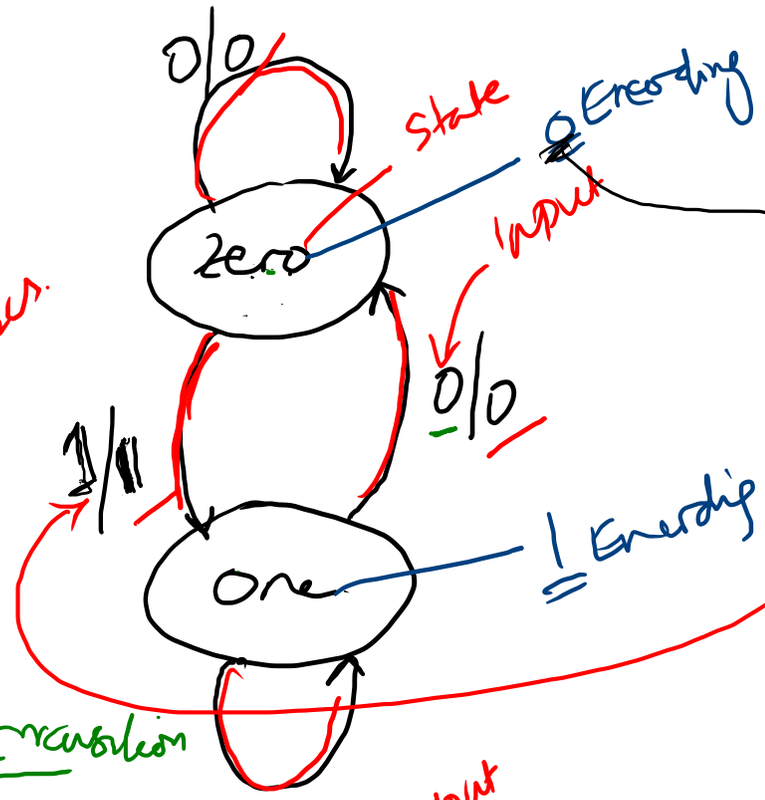
have NO glitches or erroneous o/p for a small amount of time

Soln II

Mealy
less states
Asynchronous outputs

glitches due to i/p changes & the sync. states.

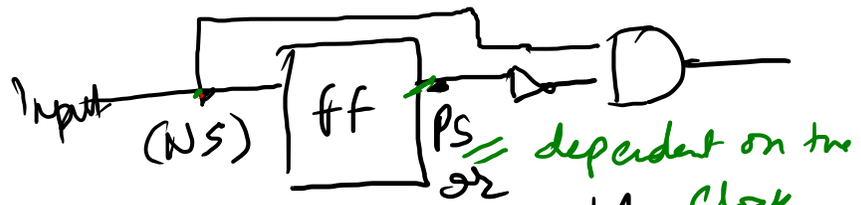
this case, the output is on the transient line/arc.



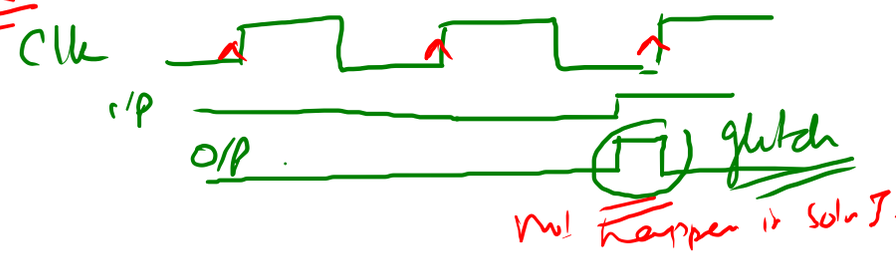
In	PS	NS	output
0	0	0	0
0	1	0	0
1	0	1	1
1	1	1	0

NS = I/P

Output = Input · $\overline{PS}$



In moore



Not happen in Soln I.

Soln I :

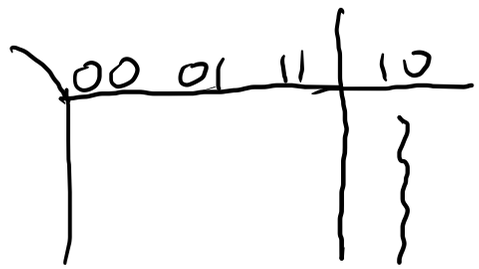
Soln II.

S

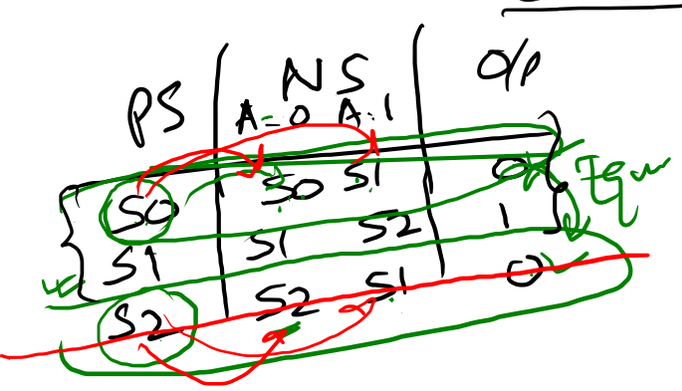
Zero 00

Int. 01

One 11 10



State Reduction: (Result in fewer gates / fewer flipflops)



Simpler design

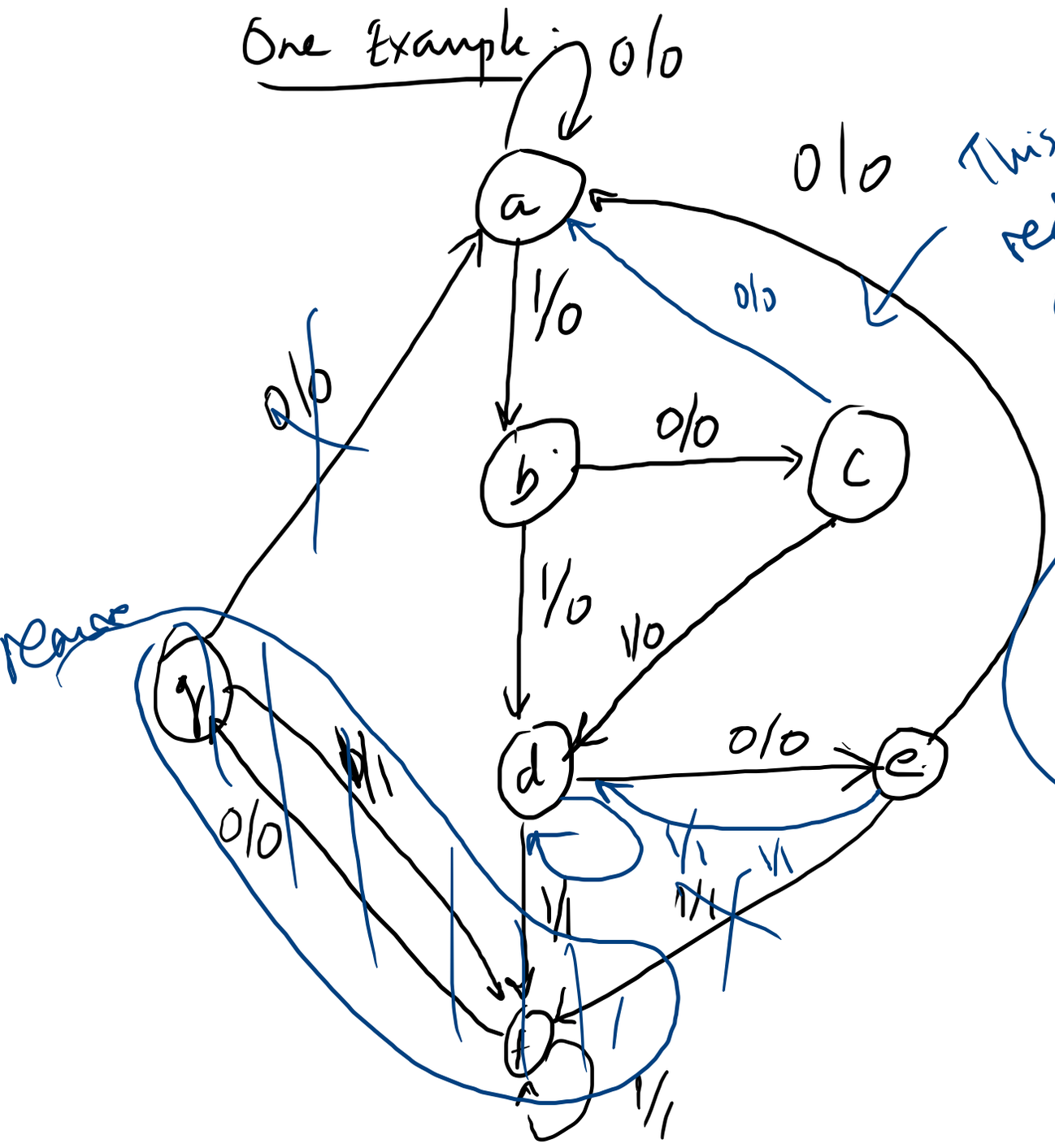
→ we will do a row matching in the State table

→ In two states if the 2 states have same O/p & transns are same to and

- they go to the ~~near~~ same next State.
- On both self loop
- or both transn to each other then

they are EQUIVALENT. (Very close to EPI)

One Example:



This is your reduced state diagram

State Tx from table

PS	NS input=0	NS input=1	Output in=0	Output in=1
a	a	b	0	0
b	c	d	0	0
c	a	d	0	0
d	e	f	0	1
e	a	f	0	1
f	g/e	f	0	1
g	a	f	0	1

estab

Reduced state table