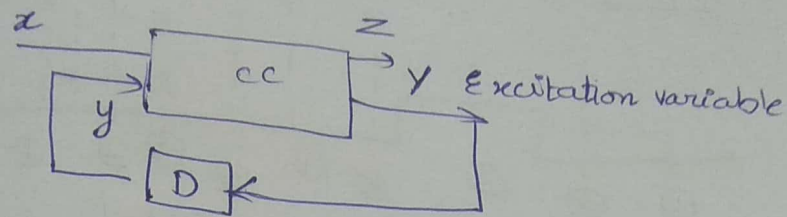


5/10/18

Asynchronous sequential circuit

- No clock
- No flipflops
- If we want output in lesser time



circuit is stable when $y = Y$

$y \rightarrow$ secondary state / internal state

$x \rightarrow$ input variable

$z \rightarrow$ output

Fundamental mode of operation:

Allow only 1 input variable to change its state before it gets into stable state.

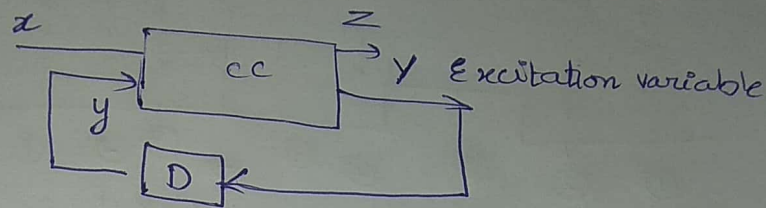
JK flip flop
circuit
the value
goes to a
10 to 11
X = 0.
from
repeats.

J, K, J_0, K_0

5/10/18

Asynchronous sequential circuit

- No clock
- No flipflops
- If we want output in lesser time



circuit is stable when $y = Y$

$y \rightarrow$ secondary state / internal state

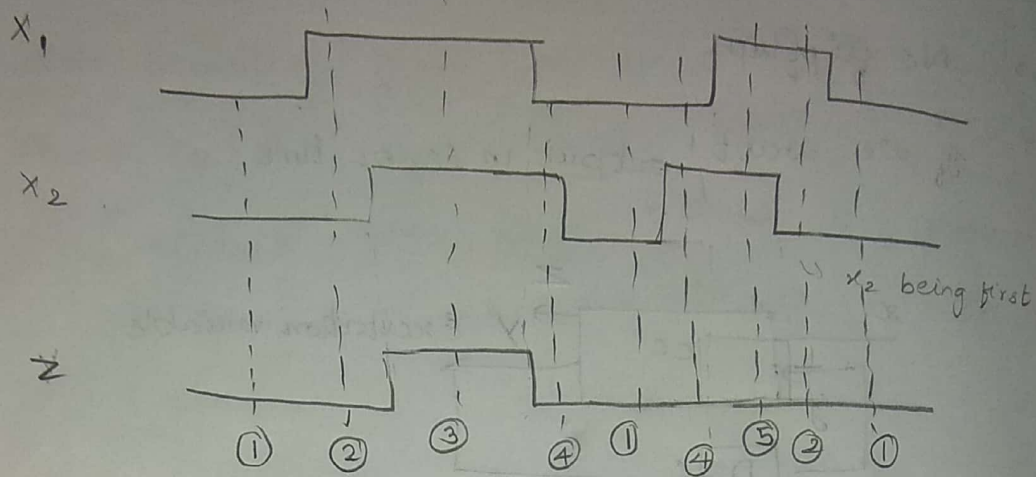
$x \rightarrow$ input variable

$z \rightarrow$ output

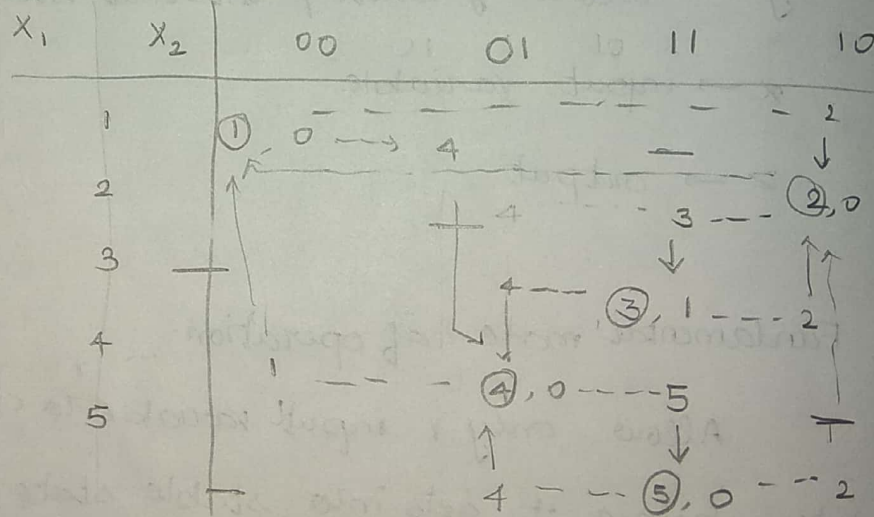
Fundamental mode of operation:

Allow only 1 input variable to change its state before it gets into stable state.

Consider a circuit with two inputs x_1 and x_2 and one output z . The output is 1 when x_1 and x_2 are 1, where x_1 being first



Stable Stable $x_1 = x_2 = 1$ $x_1 = 0$ $x_1 = x_2 = 1$
 $x_1 = x_2 = 0$ $x_1 = 1$ $z = 1$ $x_2 = 1$ $z = 0$
 $z = 0$ $x_2 = 0$ $z = 0$ $z = 0$



$x_1, x_2 \rightarrow y$

①, ②, ③ \rightarrow next states (Y)

③, ① \rightarrow output

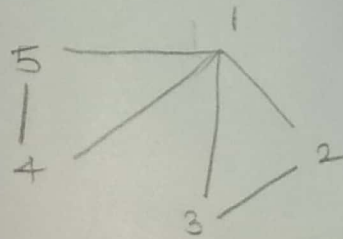
x_2
and

x_1	x_2	00	01	11	10
1		①, 0	4	-	2
2		1	-	3	②, 0
3		-	4	③, 1	2
4		1	④, 0	5	-
5		-	4	⑤, 0	2

Compatible

$1 \rightarrow 2$ $2 \rightarrow 3$
 $1 \rightarrow 3$ $4 \rightarrow 5$
 $1 \rightarrow 4$
 $1 \rightarrow 5$

Uig \rightarrow Sub graph where all the nodes are connected to each other



Edges - dig

$4, 5$ B
 $1, 2, 3$ A

x_1	x_2	00	01	11	10
A		①, 0	4, 0	③, 1	②, 0
B		1, 0	④, 0	⑤, 0	2, 0

Replace

$A \rightarrow 0$ $B \rightarrow 1$

$x_1 x_2$	$y \downarrow z \downarrow$	00	01	11	10
A		0,0	1,0	0,1	0,0
B		0,0	1,0	1,0	0,0

Y

$x_1 x_2$	00	01	11	10
y				
0	0	1	0	0
1	0	1	1	0

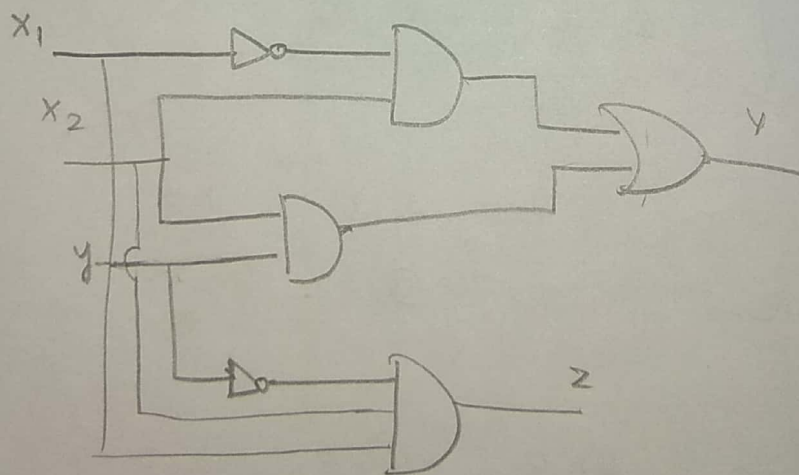
$$Y = \bar{x}_1 x_2 + y x_2$$

$x_1 x_2$	00	01	11	10
z				
0	0	0	1	0
1	0	0	0	0

$$Z = x_1 x_2 \bar{y}$$

Flow table \rightarrow states given in alphabets

Transition table \rightarrow states given in binary form
chart table



Morris mano \rightarrow 1 Prob