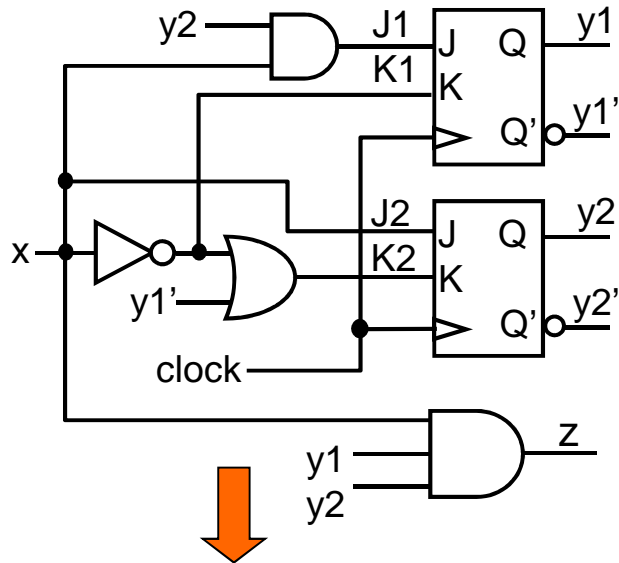


Assignment #8 – P8.6



Output equation:

$$z = x y1 y2$$

FF input equations:

$$J1 = x y2$$

$$K1 = x'$$

$$J2 = x$$

$$K2 = x' + y1'$$

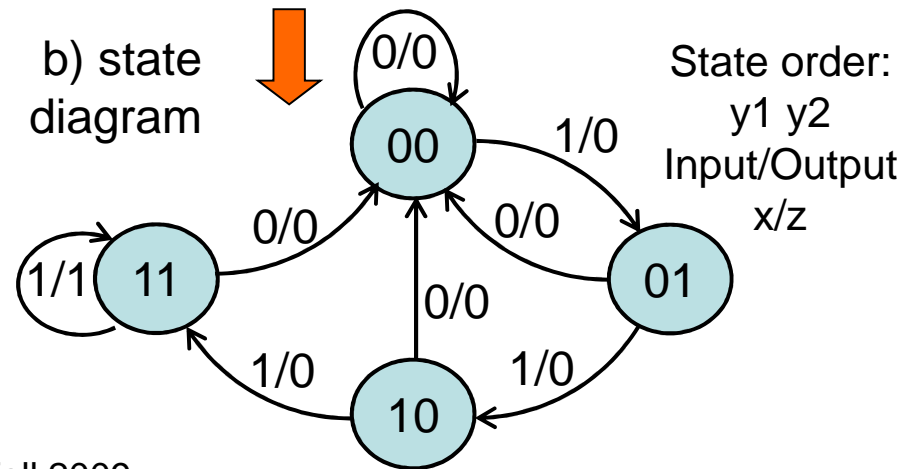
Characteristic equation:

$$\text{JKFF: } Q^+ = JQ' + K'Q$$

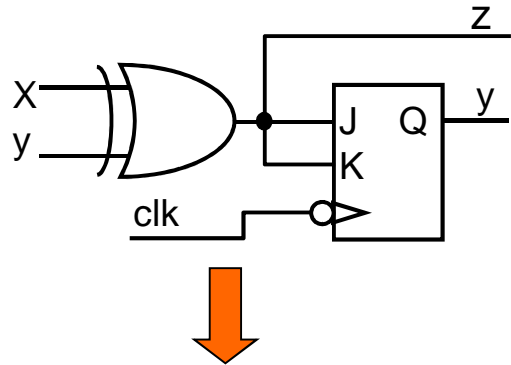
a) state table

x	y1	y2	y1 ⁺	y2 ⁺	z	J1	K1	J2	K2
0	0	0	0	0	0	0	1	0	1
0	0	1	0	0	0	0	1	0	1
0	1	0	0	0	0	0	1	0	1
0	1	1	0	0	0	0	1	0	1
1	0	0	0	1	0	0	0	1	1
1	0	1	1	0	0	1	0	1	1
1	1	0	1	1	0	0	0	1	0
1	1	1	1	1	1	1	0	1	0

b) state diagram



Assignment #8 – P8.7



Output equation:

$$z = x \oplus y$$

FF input equations:

$$J = x \oplus y$$

$$K = x \oplus y$$

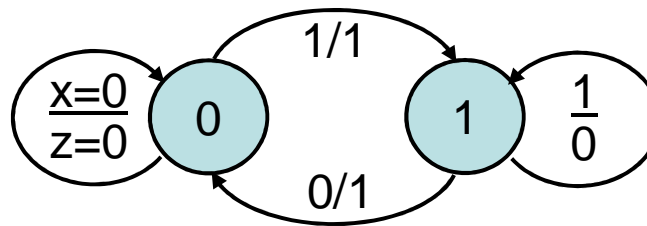
Characteristic equation:

$$\text{JKFF: } Q^+ = JQ' + K'Q$$

State Table

x	y	y ⁺	z	J	K
0	0	0	0	0	0
0	1	0	1	1	1
1	0	1	1	1	1
1	1	1	0	0	0

State Diagram



Sequence:

z 11011111

x 01101010

y 10110101

y⁺ 01101010

Starting state y=1

Note that this is the state diagram for a DFF

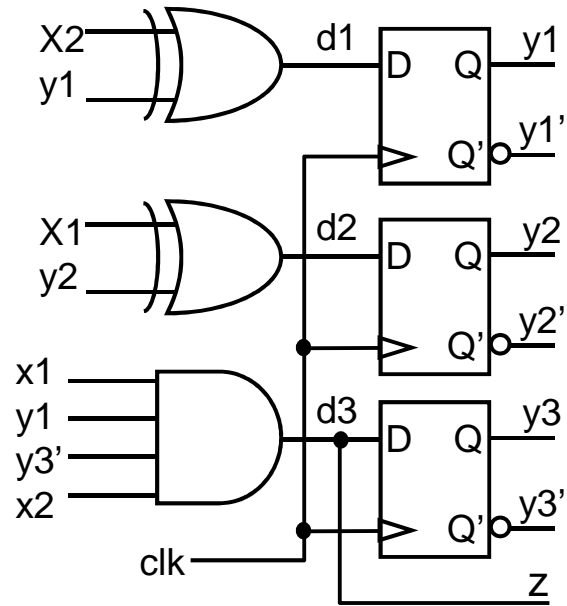
Also note that

$$y = x \oplus z$$

so the initial state is

$$y = 1 = 0 \oplus 1$$

Assignment #8 – P8.8



Output equation:

$$z = x1 y1 y3' x2$$

FF input equations:

$$d1 = x2 \oplus y1$$

$$d2 = x1 \oplus y2$$

$$d3 = z = x1 y1 y3' x2$$

Characteristic equation:

$$\text{DFF: } Q^+ = D$$

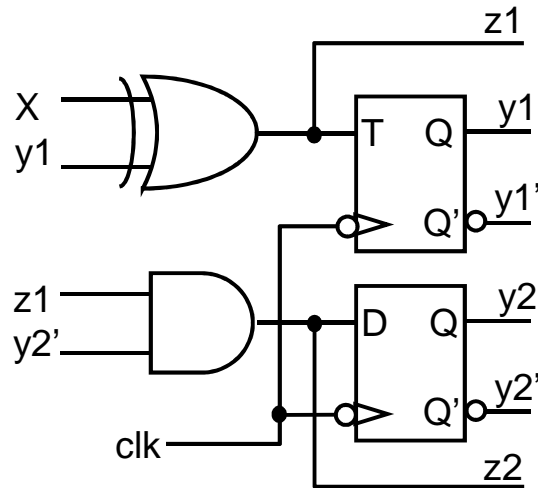
ELEC 2200

x1	x2	y1	y2	y3	y1+	y2+	y3+	z	d1	d2	d3
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0	0	0	0	0
0	0	0	1	0	0	1	0	0	0	1	0
0	0	0	1	1	0	1	0	0	0	1	0
0	0	1	0	0	1	0	0	0	1	0	0
0	0	1	0	1	1	0	0	0	1	0	0
0	0	1	1	0	1	1	0	0	1	1	0
0	0	1	1	1	1	1	0	0	1	1	0
0	1	0	0	0	1	0	0	0	1	0	0
0	1	0	0	1	1	0	0	0	1	0	0
0	1	0	1	0	1	1	0	0	1	1	0
0	1	0	1	1	1	1	0	0	1	1	0
0	1	1	0	0	0	0	0	0	0	0	0
0	1	1	0	1	0	0	0	0	0	0	0
0	1	1	1	0	0	1	0	0	0	1	0
0	1	1	1	1	0	1	0	0	0	1	0

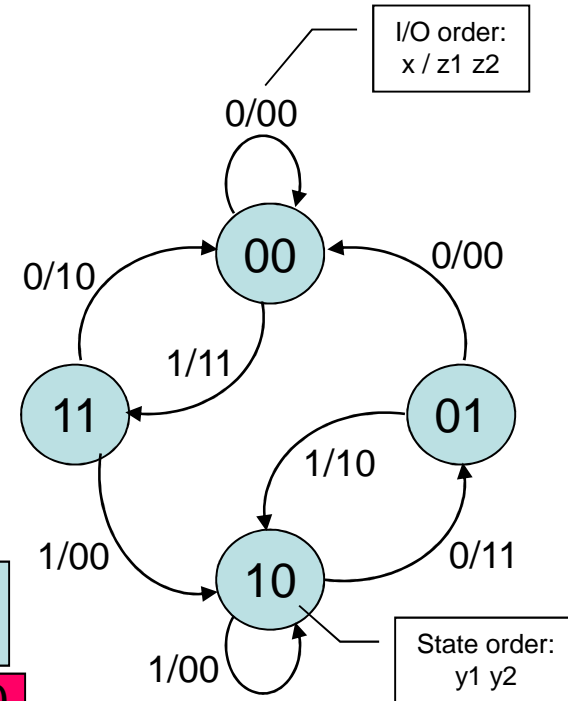
x1	x2	y1	y2	y3	y1+	y2+	y3+	Z	d1	d2	d3
1	0	0	0	0	0	1	0	0	0	1	0
1	0	0	0	1	0	1	0	0	0	1	0
1	0	0	1	0	0	0	0	0	0	0	0
1	0	0	1	1	0	0	0	0	0	0	0
1	0	1	0	0	1	1	0	0	1	1	0
1	0	1	0	1	1	1	0	0	1	1	0
1	0	1	1	0	1	0	0	0	1	0	0
1	0	1	1	1	1	0	0	0	1	0	0
1	1	0	0	0	1	1	0	0	1	1	0
1	1	0	0	1	1	1	0	0	1	1	0
1	1	0	1	0	1	0	0	0	1	0	0
1	1	0	1	1	1	0	0	0	1	0	0
1	1	1	0	0	0	0	1	1	0	0	1
1	1	1	0	1	0	0	1	1	0	0	1
1	1	1	1	0	0	0	0	0	0	0	0

Fall 2009

Assignment #8 – P8.9



x	y1 y2	y1+ y2+	z1 z2	T1 D2
0	0 0	0 0	0 0	0 0
0	0 1	0 0	0 0	0 0
0	1 0	0 1	1 1	1 1
0	1 1	0 0	1 0	1 0
1	0 0	1 1	1 1	1 1
1	0 1	1 0	1 0	1 0
1	1 0	1 0	0 0	0 0
1	1 1	1 0	0 0	0 0



Output Equations:

$$z1 = x \oplus y1$$

$$z2 = z1 y2' = (x \oplus y1) y2'$$

FF input equations:

$$T1 = z1 = x \oplus y1$$

$$D2 = z2 = z1 y2'$$

Characteristic equations:

$$\text{TFF: } Q^+ = T \oplus Q$$

$$\text{DFF: } Q^+ = D$$

Input sequence: $x = 0110111010$

Output sequence: $z1 = 0101100111$
 $z2 = 0101000101$

State sequence: $y1 = 00110111010$
 $y2 = 00101000101$

start state

end state