

# ASS 3 Solutions

①.  $x y z \rightarrow$  present state.

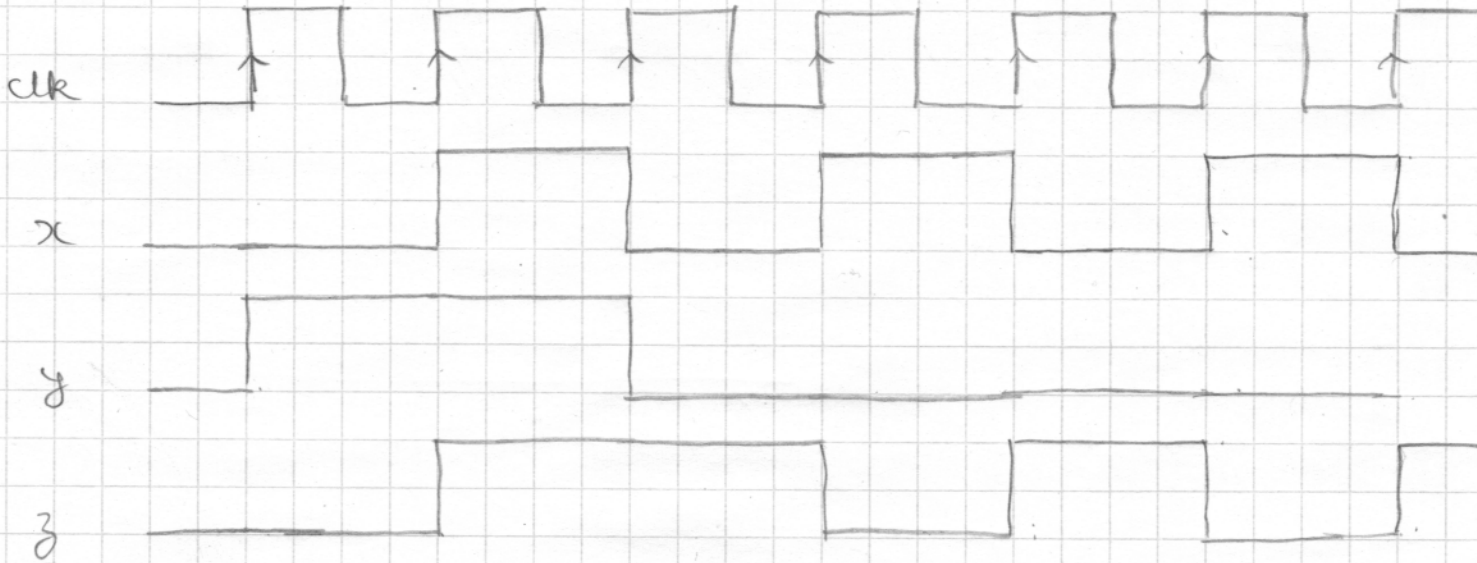
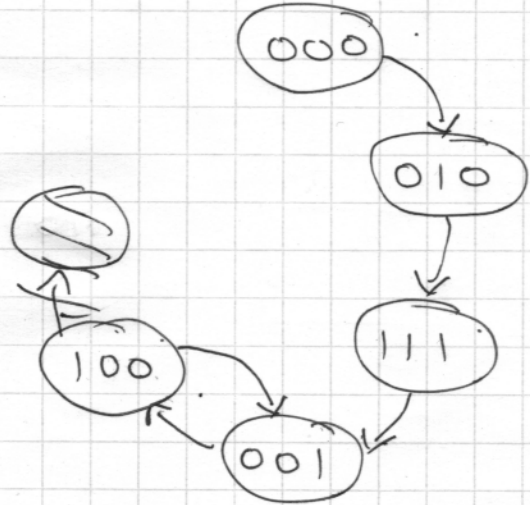
$x^+ y^+ z^+ \rightarrow$  next state.

$$x^+ = y \oplus z$$

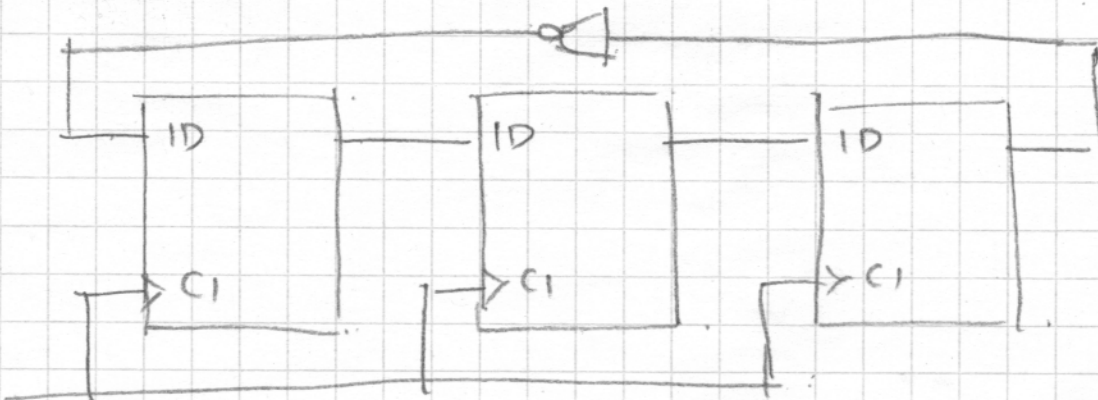
$$y^+ = \bar{x} \bar{z}$$

$$z^+ = y + x$$

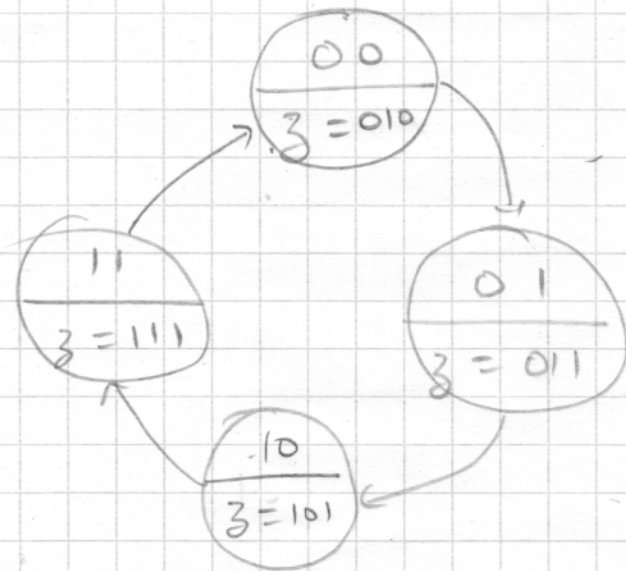
State graph starting from 000



2.



3. Circuit will count 2, 3, 5, 7 and repeat. Several designs are possible. Here is one that uses 2 flip-flops

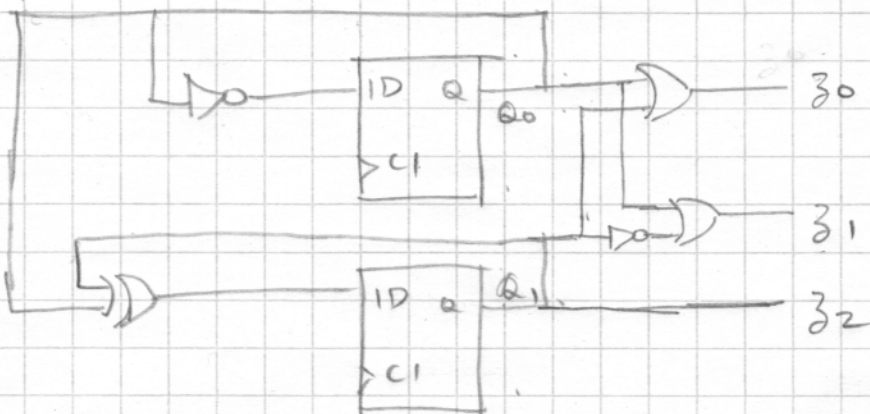


State table .

State $Q_1, Q_0$	Next state $Q_1^+, Q_0^+$	Output $z_2, z_1, z_0$
00	0 1	0 1 0
01	1 0	0 1 1
10	1 1	1 0 1
11	0 0	1 1 1

$$Q_0^+ = \bar{Q}_0 ; Q_1^+ = Q_1 \oplus Q_0.$$

$$z_0 = Q_1 + Q_0 ; z_1 = \bar{Q}_1 + Q_0 ; z_2 = Q_1$$



4.

