

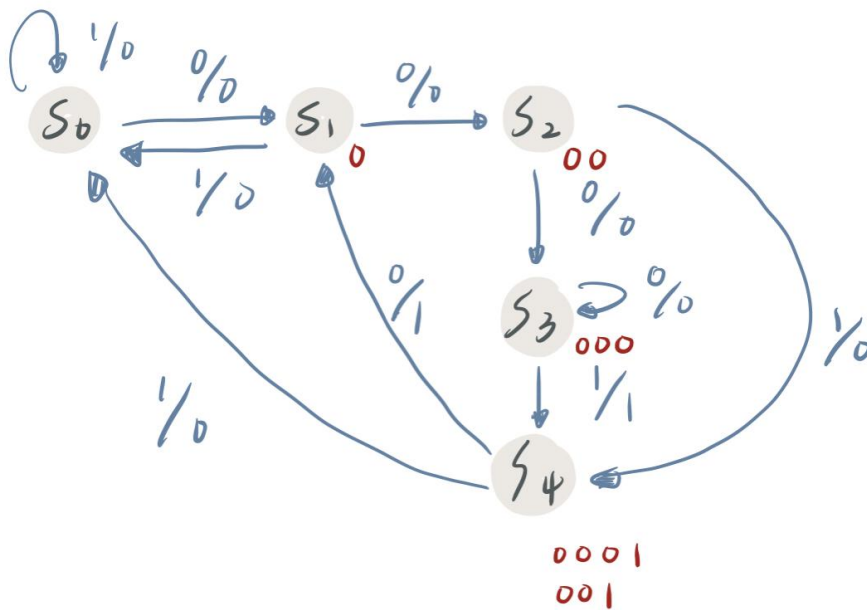
REPORT

A. How we define the circuit

- Purpose: detect 0010 and 0001
- Sliding windows, overlapping
- Mealy

B. How we design the circuit

1. state graph (Mealy)



2. next states

Present State	Next State		Present Output	
	$X=0$	$X=1$	$X=0$	$X=1$
S_0	S_1	S_0	0	0
S_1	S_2	S_0	0	0
S_2	S_3	S_4	0	0
S_3	S_3	S_4	0	1
S_4	S_1	S_0	1	0

ABC	$A^+B^+C^+$		Z	
	$X=0$	$X=1$	$X=0$	$X=1$
S_0 000	S_1 011	S_0 000	0	0
S_1 011	S_2 011	S_0 000	0	0
S_2 010	S_3 110	S_4 001	0	0
S_3 110	S_3 110	S_4 001	0	1
S_4 001	S_1 011	S_0 000	1	0

3. K-map

\overline{A} BC	00	01	11	10
00	S_1	x	x	S_0
01	S_1	x	x	S_0
11	S_2	x	x	S_0
10	S_3	S_3	S_4	S_4

\overline{A} BC	00	01	11	10
00	0	x	x	0
01	0	x	x	0
11	0	x	x	0
10	1	1	0	0

$$A^+ = X'BC'$$

\overline{A} BC	00	01	11	10
00	1	x	x	0
01	1	x	x	0
11	1	x	x	0
10	1	1	0	0

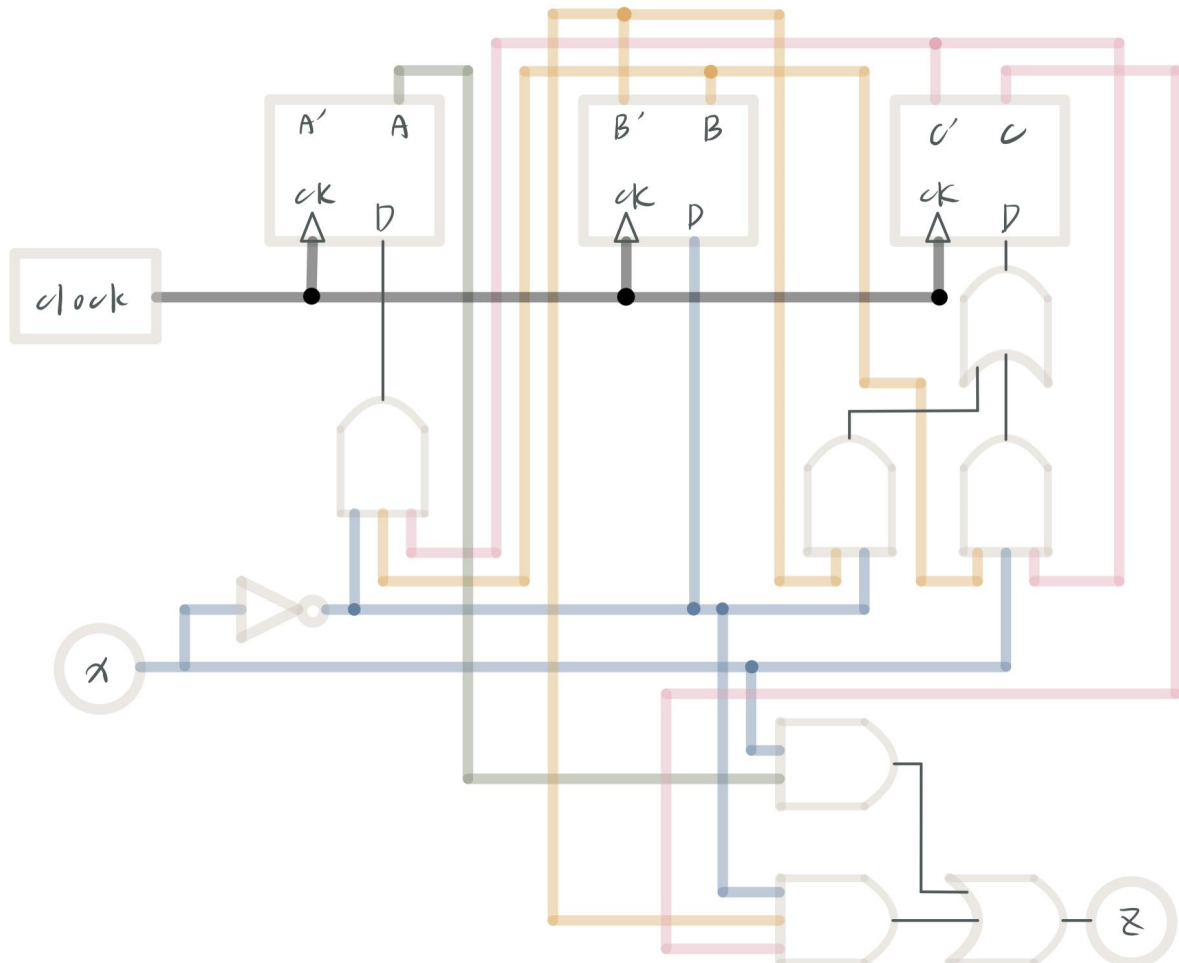
$$B^+ = X'$$

\overline{A} BC	00	01	11	10
00	1	x	x	0
01	1	x	x	0
11	0	x	x	0
10	0	0	1	1

$$C^+ = X'B' + XBC'$$

\overline{A} BC	00	01	11	10
00	0	x	x	0
01	1	x	x	0
11	0	x	x	0
10	0	0	1	0

4.block diagram



C.Verify

1.

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bit      :123456789abcdefghij
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input : 1100100110001000010

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output:0000010000001100011
```

D. Result

1.

E.What we learn

