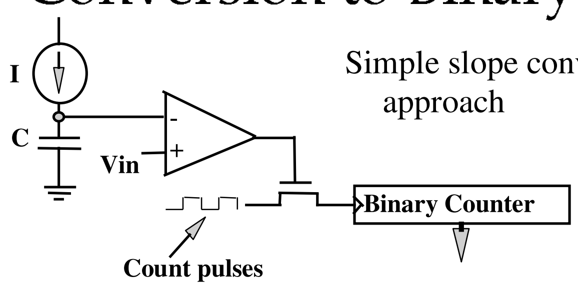
Outline

❍ Last time:
- ➔ Error Detection & Correction
- ➔ State Assignment in Asynchronous

❍ This lecture:
- ➔ Review
- ➔ Analog-Digital Conversion
- ➔ Counters and analysis

CS150 Newton 15.2.1

Analog-to-Digital Conversion: Conversion to Binary



Simple slope conversion approach

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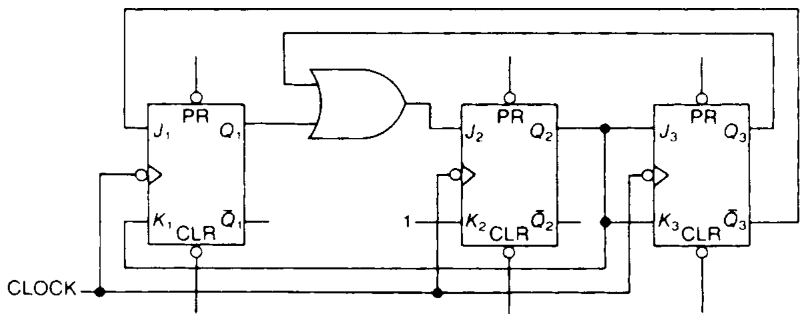
Example 1

- Obtain the state table for the circuit below, starting from the state $Q_3Q_2Q_1$=000.



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Example 1

- State table:

PS	J_3K_3	J_2K_2	J_1K_1	NS
000	00	01	10	001
001	00	11	10	011
011	11	11	11	100
100	00	11	00	110
110	11	11	01	000

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Example 2

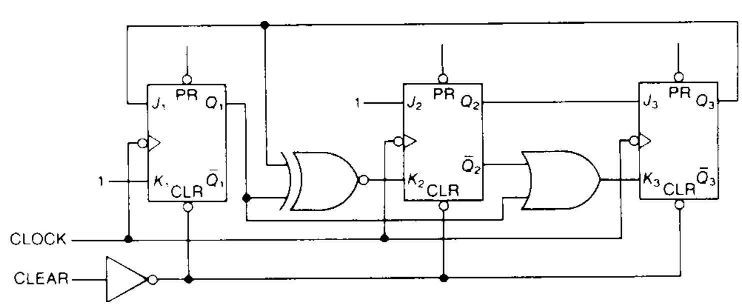
- Obtain a synchronous counter that produces the count sequence 0, 2, 4, 3, 6, 7, 0, ...

PS	NS			
$Q_3Q_2Q_1$	$Q_3Q_2Q_1$	J_3K_3	J_2K_2	J_1K_1
000	010	0—	1—	0—
001	— —	— —	— —	— —
010	100	1—	—1	0—
011	110	1—	—0	—1
100	011	—1	1—	1—
101	— — —	— —	— —	— —
110	111	—0	—0	1—
111	000	—1	—1	—1

Example 2

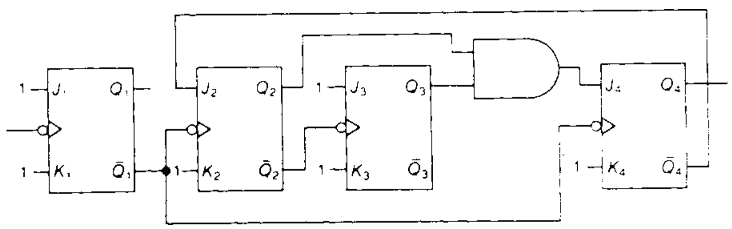
- J & K Boolean equations:

$$J_1 = Q_3$$
$$K_1 = 1$$
$$J_2 = 1$$
$$K_2 = \overline{Q_1 \oplus Q_3}$$
$$J_3 = Q_2$$
$$K_3 = Q_1 + \bar{Q}_2$$



Example 3

❍ Describe the function and characteristics of the circuit shown below:



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15.2.7