

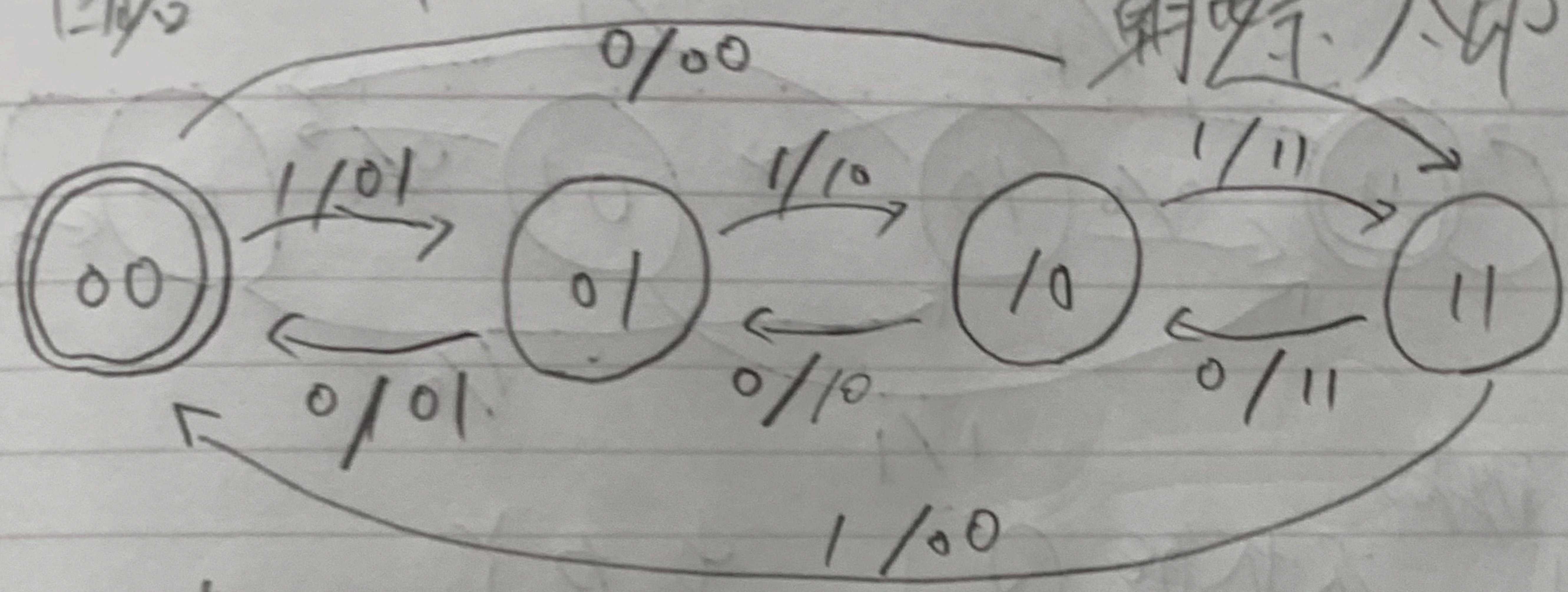
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デジタル回路

演習①



状態遷移表

| 現状能 | | 次状態 Q' | | | | 出力 Y | | | |
|-------|-------|----------|--------|--------|--------|--------|-------|-------|-------|
| | | 入力 X | | | | 入力 X | | | |
| q_1 | q_0 | $x=0$ | | $x=1$ | | y_0 | | y_1 | |
| | | q_1' | q_0' | q_1' | q_0' | y_1 | y_0 | y_1 | y_0 |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |

状態遷移関数

$$D_0' = q_0' = q_0, \quad D_1' = q_1' = X \oplus q_0 \oplus q_1$$

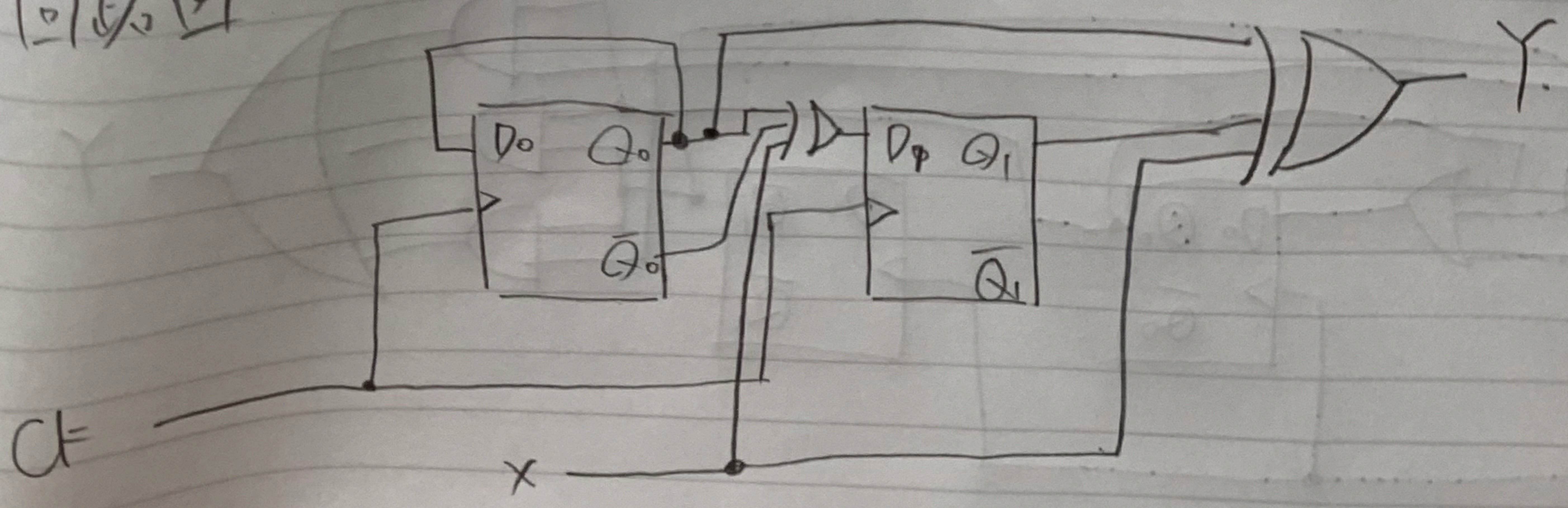
出力関数

$$Y = X \oplus q_0 \oplus q_1$$

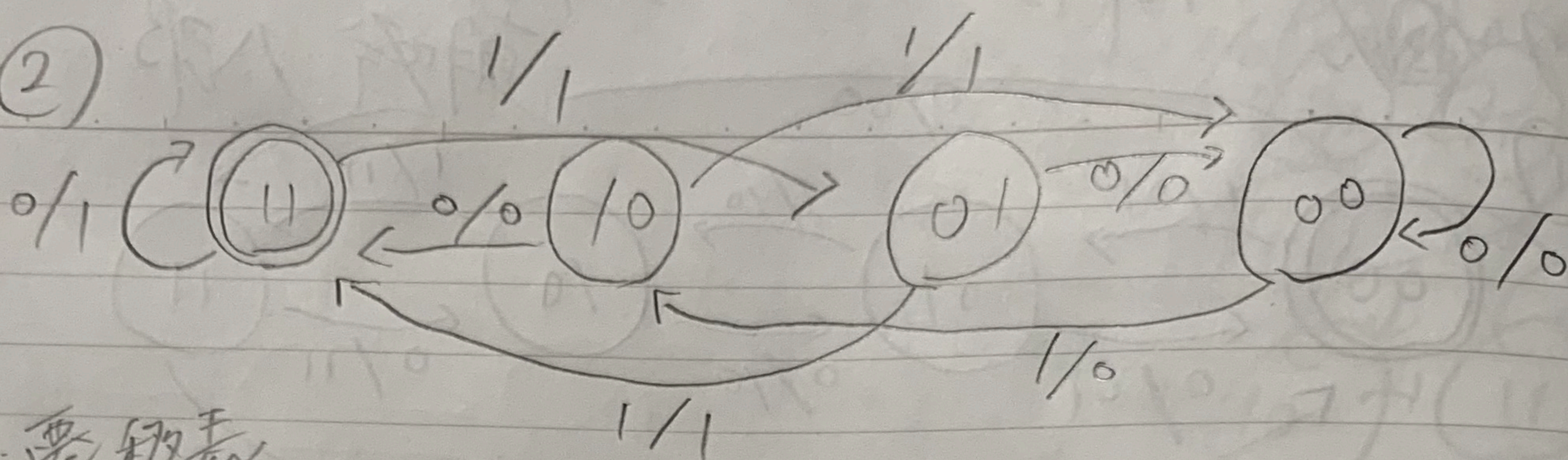
$$y_0 = X \oplus q_0 \oplus q_1$$

$$y_1 = X \oplus q_0 \oplus q_1$$

回路図



演習②



状態遷移表

| 現状態 Q | 次状態 Q' | | | | 出力 Y | |
|------------|------------------|--------|--------|--------|------------------|-----|
| | λ 入力 X | | | | λ 出力 Y | |
| q_1, q_0 | q_1' | q_0' | q_1' | q_0' | Y | Y |
| 0, 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 0, 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 1, 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 1, 1 | 1 | 1 | 0 | 1 | 1 | 1 |

状態遷移関数

$$D_0' = q_0' = X + q_1 + q_0, \quad D_1' = q_1'$$

出力関数

$$Y = q_1 \cdot q_0 + q_0 \cdot X + X \cdot q_1$$

回路図

