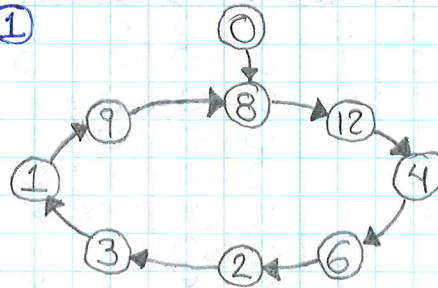


Sim. #6: Control de Motores

Paso	A	B	C	D	Valor
	Q_3	Q_2	Q_1	Q_0	Binario
0	0	0	0	0	0
1	1	0	0	0	8
2	1	1	0	0	12
3	0	1	0	0	4
4	0	1	1	0	6
5	0	0	1	0	2
6	0	0	1	1	3
7	0	0	0	1	1
8	1	0	0	1	9

①



②

	Q_3	Q_2	Q_1	Q_0	Next					$\overline{Q_3}$	$\overline{Q_2}$	$\overline{Q_1}$	$\overline{Q_0}$	D3	D2	D1	D0
0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	0
8	1	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0
12	1	1	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0
4	0	1	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0
6	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0
2	0	0	1	0	0	0	0	1	1	0	0	0	1	0	0	1	1
3	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	1
1	0	0	0	1	1	0	0	0	1	1	0	0	1	1	0	0	1
9	1	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0

③

$Q_3 Q_2$	00	01	11	10
$Q_1 Q_0$	00	1 ₄	0 ₄	1 ₈
01	1 ₁	X ₅	X ₁₃	1 ₉
11	0 ₃	X ₇	X ₁₅	X ₁₁
10	0 ₂	0 ₆	X ₁₄	X ₁₀

$$D3 = \overline{Q_1} \overline{Q_2}$$

$Q_3 Q_2$	00	01	11	10
$Q_1 Q_0$	00	0 ₄	1 ₄	1 ₈
01	0 ₁	X ₅	X ₁₄	0 ₉
11	0 ₃	X ₇	X ₁₅	X ₁₁
10	0 ₂	0 ₆	X ₁₄	X ₁₀

$$D2 = \overline{Q_1} Q_2 + Q_3 \overline{Q_0}$$

⑤

$$\begin{cases} D3 = \overline{Q_2} \overline{Q_1} \\ D2 = Q_2 \overline{Q_1} + Q_3 \overline{Q_0} \\ D1 = Q_1 \overline{Q_0} + \overline{Q_3} Q_2 \\ D0 = \overline{Q_3} Q_0 + \overline{Q_2} Q_1 \end{cases}$$

④

$Q_3 Q_2$	00	01	11	10
$Q_1 Q_0$	00	0 ₄	1 ₄	0 ₈
01	0 ₁	X ₅	X ₁₃	0 ₉
11	0 ₃	X ₇	X ₁₅	X ₁₁
10	1 ₂	1 ₆	X ₁₄	X ₁₀

$$D1 = Q_1 \overline{Q_0} + \overline{Q_3} Q_2$$

$Q_3 Q_2$	00	01	11	10
$Q_1 Q_0$	00	0 ₄	0 ₄	0 ₈
01	1 ₁	X ₅	X ₁₃	0 ₉
11	1 ₃	X ₇	X ₁₅	X ₁₁
10	1 ₂	0 ₆	X ₁₄	X ₁₀

$$D0 = \overline{Q_3} Q_0 + \overline{Q_2} Q_1$$

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	Q ₃	Q ₂	Q ₁	Q ₀	E ₀	U ₃	U ₂	U ₁	U ₀
0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	0	1
2	0	0	1	0	0	0	0	1	0
3	0	0	1	1	0	0	0	1	1
4	0	1	0	0	0	0	1	0	0
5	0	1	0	1	X	X	X	X	X
6	0	1	1	0	0	0	1	1	0
7	0	1	1	1	X	X	X	X	X
8	1	0	0	0	0	1	0	0	0
9	1	0	0	1	0	1	0	0	1
10	1	0	1	0	X	X	X	X	X
11	1	0	1	1	X	X	X	X	X
12	1	1	0	0	0	0	0	1	0
13	1	1	0	1	X	X	X	X	X
14	1	1	1	0	X	X	X	X	X
15	1	1	1	1	X	X	X	X	X

$$E_0 = Q_3 Q_2 \quad \text{Display Decenas}$$

$$U_3 = Q_3 \overline{Q_2}$$

$$U_2 = \overline{Q_3} Q_2$$

$$U_1 = E_0 + Q_1 = Q_3 Q_2 + Q_1$$

$$U_0 = Q_0$$

Display Unidades

Q ₃ Q ₂	00	01	11	10
Q ₁ Q ₀	00 0 ₀ 0 ₁ 1 ₂ 0 ₃	01 0 ₄ X ₅ 1 ₃ 0 ₇	11 0 ₂ X ₇ 1 ₅ 1 ₁	10 0 ₆ 0 ₅ X ₄ 1 ₀

$$E_0 = Q_3 Q_2$$

Q ₃ Q ₂	00	01	11	10
Q ₁ Q ₀	00 0 ₀ 0 ₄ 0 ₈ 1 ₈	01 0 ₁ X ₅ 0 ₃ 1 ₉	11 0 ₂ X ₇ 0 ₅ 1 ₁₀	10 0 ₆ 0 ₅ X ₄ 1 ₀

$$U_3 = Q_3 \overline{Q_2}$$

Q ₃ Q ₂	00	01	11	10
Q ₁ Q ₀	00 0 ₀ 1 ₄ 0 ₂ 0 ₈	01 0 ₁ X ₅ 0 ₃ 0 ₉	11 0 ₂ X ₇ 0 ₅ 0 ₁₁	10 0 ₆ 1 ₆ X ₄ 0 ₁₀

$$U_2 = \overline{Q_3} Q_2$$

Q ₃ Q ₂	00	01	11	10
Q ₁ Q ₀	00 0 ₀ 0 ₄ 1 ₂ 0 ₈	01 0 ₁ X ₅ 0 ₃ 0 ₉	11 1 ₃ X ₇ 0 ₅ 0 ₁₁	10 1 ₂ 1 ₆ X ₄ 0 ₁₀

$$U_1 = Q_3 Q_2 + Q_1$$

Q ₃ Q ₂	00	01	11	10
Q ₁ Q ₀	00 0 ₀ 0 ₄ 0 ₁₂ 0 ₈	01 1 ₁ X ₅ 0 ₁₃ 1 ₉	11 1 ₃ X ₇ 0 ₁₅ 1 ₁₁	10 0 ₂ 0 ₆ X ₄ 0 ₁₀

$$U_0 = Q_0$$