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| $a_1$ | $a_2$ | $a_3$ | $a_4$ | $q_1$ | $q_2$ | $q_3$ | $q_4$ | $q_5$ | $q_6$ | $q_7$ | $q_8$ |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| 0     | 0     | 0     | 1     | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 1     |
| 0     | 0     | 1     | 0     | 0     | 0     | 0     | 0     | 0     | 1     | 0     | 0     |
| 0     | 0     | 1     | 1     | 0     | 0     | 0     | 0     | 1     | 0     | 0     | 1     |
| 0     | 1     | 0     | 0     | 0     | 0     | 0     | 1     | 0     | 0     | 0     | 0     |
| 0     | 1     | 0     | 1     | 0     | 0     | 0     | 1     | 1     | 0     | 0     | 1     |
| 0     | 1     | 1     | 0     | 0     | 0     | 1     | 0     | 0     | 1     | 0     | 0     |
| 0     | 1     | 1     | 1     | 0     | 0     | 1     | 1     | 0     | 0     | 0     | 1     |
| 1     | 0     | 0     | 0     | 0     | 1     | 0     | 0     | 0     | 0     | 0     | 0     |
| 1     | 0     | 0     | 1     | 0     | 1     | 0     | 1     | 0     | 0     | 0     | 1     |
| 1     | 0     | 1     | 0     | 0     | 1     | 1     | 0     | 0     | 1     | 0     | 0     |
| 1     | 0     | 1     | 1     | 0     | 1     | 1     | 1     | 1     | 0     | 0     | 1     |
| 1     | 1     | 0     | 0     | 1     | 0     | 0     | 1     | 0     | 0     | 0     | 0     |
| 1     | 1     | 0     | 1     | 1     | 0     | 1     | 0     | 1     | 0     | 0     | 1     |
| 1     | 1     | 1     | 0     | 1     | 1     | 0     | 0     | 0     | 1     | 0     | 0     |
| 1     | 1     | 1     | 1     | 1     | 1     | 1     | 1     | 0     | 0     | 0     | 1     |

2 Karnaugh:

$$q_1 = a_1 a_2$$

$$q_2 = a_1 \bar{a}_2 + a_1 a_3$$

$$q_3 = \bar{a}_1 \bar{a}_2 \bar{a}_3 + \bar{a}_1 \bar{a}_2 a_3 + \bar{a}_1 a_2 \bar{a}_3 + \bar{a}_1 a_2 a_3$$

$$q_4 = a_2 \bar{a}_3 \bar{a}_4 + a_2 \bar{a}_3 a_4 + a_2 a_3 \bar{a}_4 + a_2 a_3 a_4$$

$$q_5 = \bar{a}_2 \bar{a}_3 a_4 + \bar{a}_2 a_3 a_4$$

$$q_6 = a_3 \bar{a}_4$$

$$q_7 = 0$$

$$q_8 = a_4$$