Due: Thursday, November 18, 2003

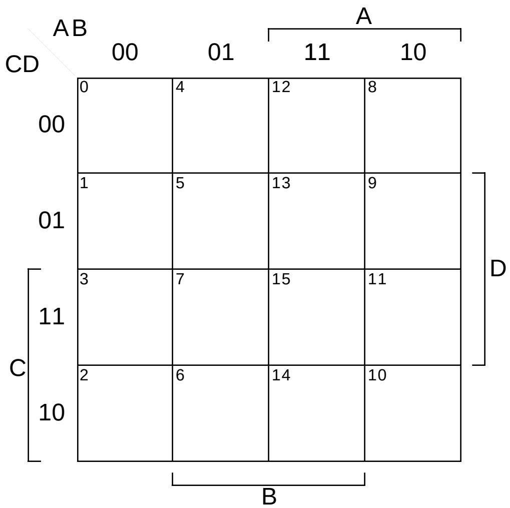
1. (10 points) Question 3.9, page 96, Murdocca & Heuring
2. (10 points) Question 3.14, page 97, Murdocca & Heuring
3. (10 points) Question A.12, page 494, Murdocca & Heuring
4. (50 points) In the following, the notation $\sum m(x_1, \ldots, x_j)$ indicates a Boolean function that is the sum of the minterms $x_1, \ldots, x_j$, where x_i is the ith minterm in canonical ordering — i.e., the ith row of the truth table where the input values are ordered as binary numbers. Similarly,

   $$\sum m(x_1, \ldots, x_j) + d(y_1, \ldots, y_k)$$

   indicates a Boolean function that is the sum of the minterms $x_1, \ldots, x_j$ and whose values for rows $y_1, \ldots, y_k$ of the truth table are *don't cares*.

   Minimize the following functions using Karnaugh maps. Then, write down a Boolean formula in sum-of-products or product-of-sums form for each function. Show your work (including the Karnaugh maps).

   (a) $f(A, B, C, D) = \sum m(0, 1, 2, 8, 9, 14, 15)$
   (b) $f(A, B, C, D) = \sum m(0, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 15)$
   (c) $f(A, B, C, D) = \sum m(2, 3, 4, 5, 6, 7, 8, 9, 10, 13)$
   (d) $f(A, B, C, D) = \sum m(4, 12, 13, 14, 15) + d(0, 3, 5, 8)$
   (e) $f(A, B, C, D) = \sum m(0, 2, 4, 8, 10, 12, 13) + d(5, 14, 15)$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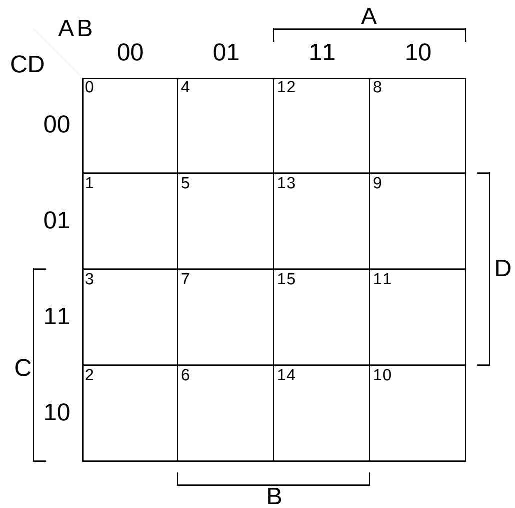
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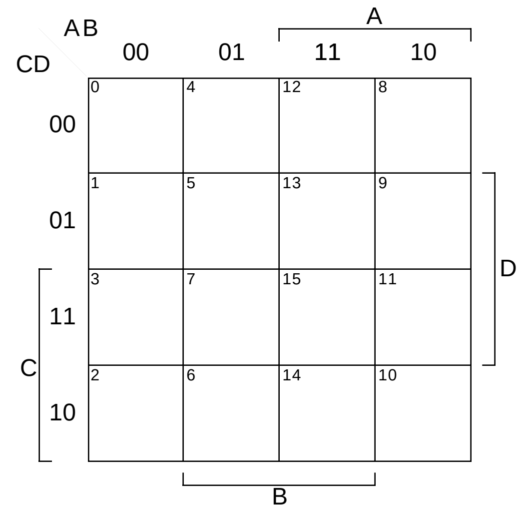
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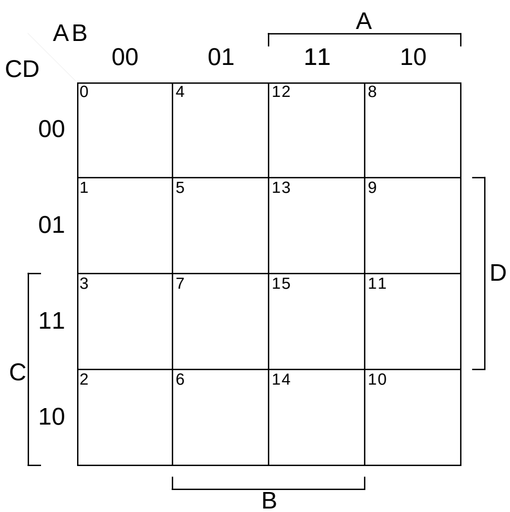
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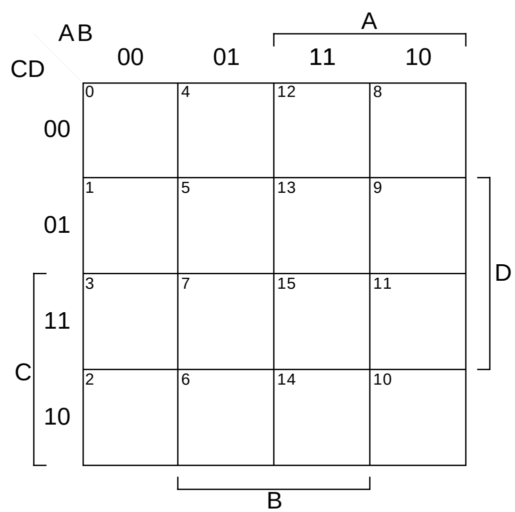
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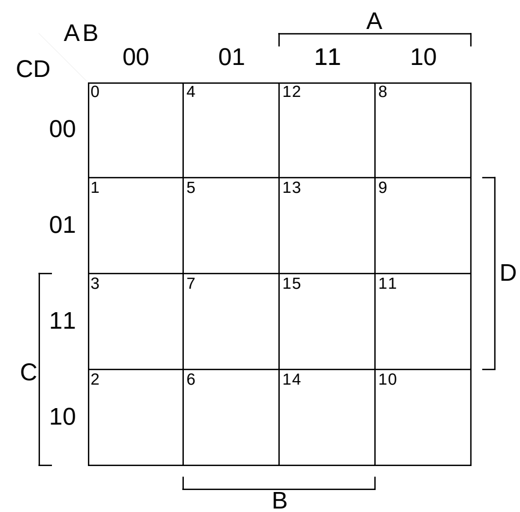
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