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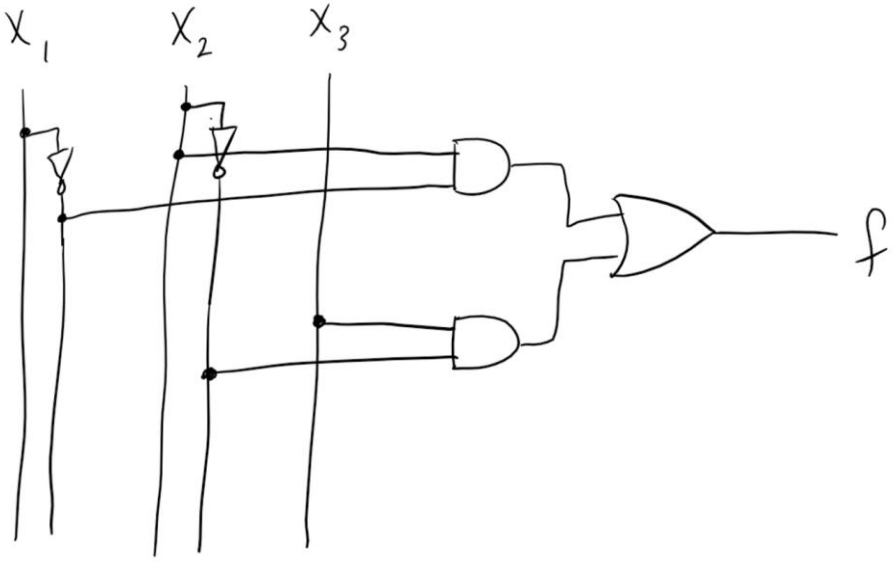
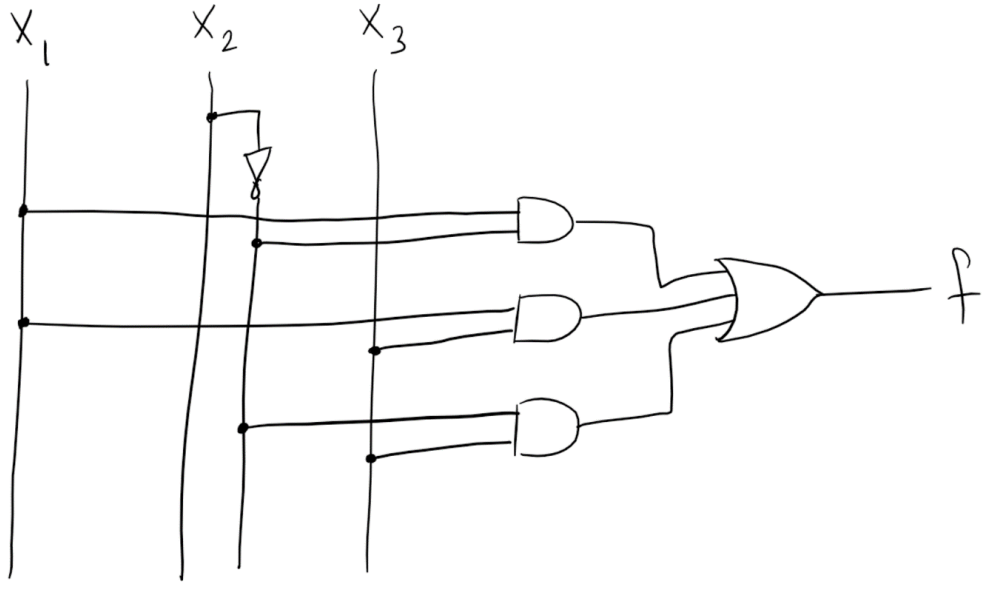
4.1: $f(x_1, x_2, x_3) = \sum m(1,2,3,5) = \overline{x_1}x_2 + \overline{x_1}x_3 + \overline{x_2}x_3$

$= \overline{x_1}x_2 + \overline{x_2}x_3$



4.2: $f(x_1, x_2, x_3) = \sum m(1,4,7) + D(2,5) = x_1x_3 + x_1\overline{x_2} + \overline{x_2}x_3$



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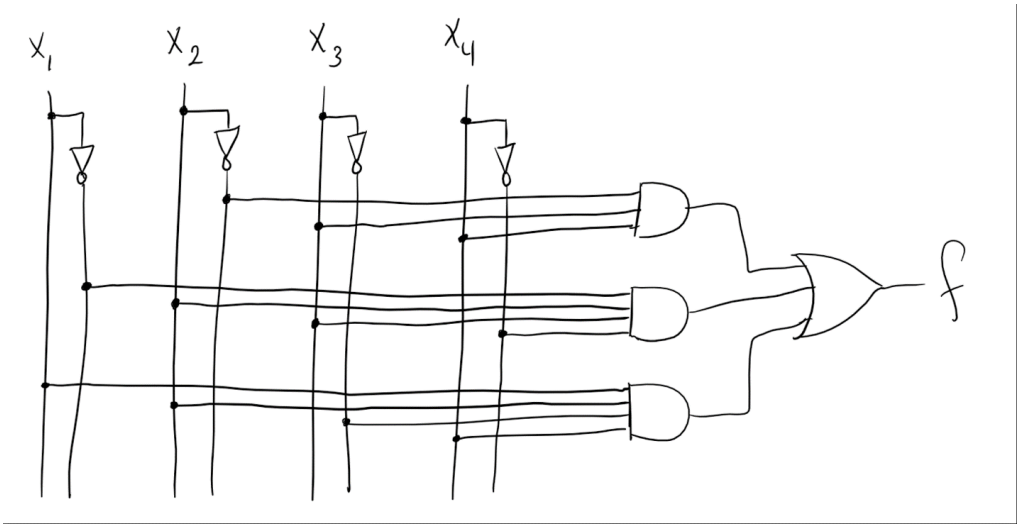
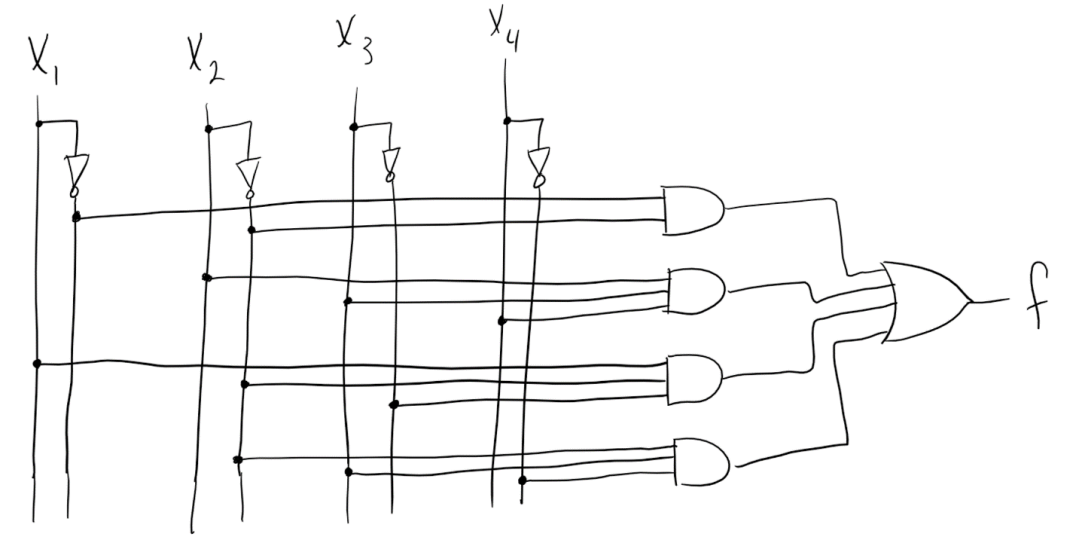
4.3: $f(x_1, x_2, x_3, x_4) = \prod M(0,1,2,4,5,7,8,9,10,12,14,15) = \sum m(3,6,11,13)$

$= \overline{x_2} x_3 x_4 + \overline{x_1} x_2 x_3 \overline{x_4} + x_1 x_2 \overline{x_3} x_4$



4.4: $f(x_1, x_2, x_3, x_4) = \sum m(0,2,8,9,10,15) + D(1,3,6,7)$

$= \overline{x_1 x_2} + x_2 x_3 x_4 + x_1 \overline{x_2 x_3} + \overline{x_2} x_3 \overline{x_4}$



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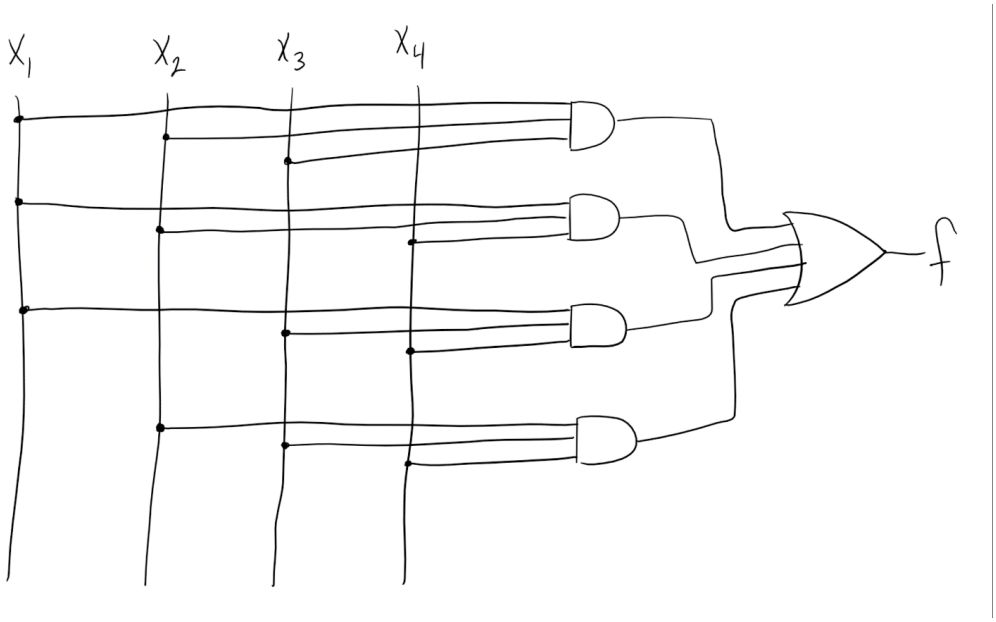
4.9: $f(x_1, x_2, x_3, x_4) = x_1x_2x_3 + x_1x_2x_4 + x_1x_3x_4 + x_2x_3x_4$



4.10: $f(x_1, x_2, x_3, x_4) = \overline{x_1}x_2x_3 + \overline{x_1}x_3x_4 + x_2\overline{x_3}x_4 + x_1x_2\overline{x_3} + x_1\overline{x_2}x_4 + x_1x_3\overline{x_4}$