|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | X4 | X3 | X2 | X1 | Y |
| 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 2 | 0 | 0 | 1 | 0 | 0 |
| 3 | 0 | 0 | 1 | 1 | 0 |
| 4 | 0 | 1 | 0 | 0 | 1 |
| 5 | 0 | 1 | 0 | 1 | 0 |
| 6 | 0 | 1 | 1 | 0 | 1 |
| 7 | 0 | 1 | 1 | 1 | 0 |
| 8 | 1 | 0 | 0 | 0 | 0 |
| 9 | 1 | 0 | 0 | 1 | 1 |
| 10 | 1 | 0 | 1 | 0 | 1 |
| 11 | 1 | 0 | 1 | 1 | 1 |
| 12 | 1 | 1 | 0 | 0 | 1 |
| 13 | 1 | 1 | 0 | 1 | 1 |
| 14 | 1 | 1 | 1 | 0 | 0 |
| 15 | 0 | 0 | 0 | 0 | 0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x4,x3\x2,x1 | 00 (x2) | 01 (x2) (x1) | 11 (x1) | 10 |
| 00 (x4) | 0 | 0 | 0 | 0 |
| 01 (x4) (x3) | 1 | 0 | 0 | 1 |
| 11 (x3) | 1 | 1 | 0 | 0 |
| 10 | 0 | 1 | 1 | 1 |

Вариант 1:

!x4 x3 !x1 + x4 !x3 x2 + x4 !x2 x1 + x3 !x2 !x1

Для базиса not, band, nand: !!( !x4 x3 !x1 + x4 !x3 x2 + x4 !x2 x1 + x3 !x2 !x1) = !(!(!x4 x3 !x1) !(x4 !x3 x2) !(x4 !x2 x1) !(x3 !x2 !x1))

Для базиса not, bor, nor: !(x4 + !x3 + x1) + !(!x4 + x3 + !x2) + !(!x4 + x2 + !x1) + !(!x3 + x2 + x1)

Вариант 2 (улучшенный):

Вследствие минимизации функций методом карт Карно получаем следующую функцию: y = ~x4 x3 ~x1 + x4 ~x3 x2 + x4 ~x2 x1 + x3 ~x2 ~x1.

Для базиса not, band, nand: y = ~x4 x3 ~x1 + x4 ~x3 x2 + x4 ~x2 x1 + x3 ~x2 ~x1 = ~~(~x4 x3 ~x1 + x4 ~x3 x2 + x4 ~x2 x1 + x3 ~x2 ~x1) = ~(~(~x4 x3 ~x1) ~(x4 ~x3 x2) ~(x4 ~x2 x1) ~(x3 ~x2 ~x1)).

Для базиса not, bor, nor: y = ~x4 x3 ~x1 + x4 ~x3 x2 + x4 ~x2 x1 + x3 ~x2 ~x1 = ~~(~x4 x3 ~x1) + ~~(x4 ~x3 x2) + ~~(x4 ~x2 x1) + ~~(x3 ~x2 ~x1) = ~(x4 + ~x3 + x1) + ~(~x4 + x3 + ~x2) + ~(~x4 + x2 + ~x1) + ~(~x3 + x2 + x1).