Given the tally below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| HEX | sw | PRIME | a | b | c | d | e | f | g |
| 0 | 0000 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1 | 0001 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2 | 0010 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 3 | 0011 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 4 | 0100 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 5 | 0101 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 6 | 0110 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 7 | 0111 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 8 | 1000 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 1001 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| A | 1010 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| b | 1011 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| c | 1100 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| d | 1101 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| E | 1110 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| F | 1111 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |

Kmap PDF Variables Docx Variables Input Equivalent

A = w = sw(3)

B = x = sw(2)

C = y = sw(1)

D = z = sw(0)

Template:

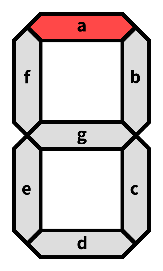
C(w, x, y, z) = Σ(0, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13)

(w’x’y’z’) + (w’x’y’z’) + (w’x’y’z’) + (w’x’y’z’)

**Font:** Source Sans Pro

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | yz |  |  |  |  |
| wx |  | 00 | 01 | 11 | 10 |
|  | 00 | m0 | m1 | m3 | m2 |
|  | 01 | m4 | m5 | m7 | m6 |
|  | 11 | m12 | m13 | m15 | m14 |
|  | 10 | m8 | m9 | m11 | m10 |

a(w, x, y, z) = Σ(0, 2 ,3, 5, 6, 7,8, 9, 10, 14, 15)

Given the Karnaugh Map below:

PAIR

LINE 4

QUAD

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | yz |  |  |  |  |
| wx |  | 00 | 01 | 11 | 10 |
|  | 00 | m0 | m1 | m3 | m2 |
|  | 01 | m4 | m5 | m7 | m6 |
|  | 11 | m12 | m13 | m15 | m14 |
|  | 10 | m8 | m9 | m11 | m10 |

(0, 2, 8, 10)

= (w’x’y’z’) + (w’x’yz’) + (wx’y’z') + (wx’yz’)

= (w’x’z’) + (wx’z’)

**= x’z’ (B’D’)**

(2, 3, 6, 7)

= (w’x’yz’) + (w’x’yz) + (w’xyz') + (w’xyz)

= (w’x’y) + (w’xy)

**= w’y (A’C)**

(6, 7, 14,15)

= (w’xyz’) + (w’xyz) + (wxyz’) + (wxyz)

= (w’xy) + (wxy)

**= xy (BC)**

(5, 7)

= (w’xy’z) + (w’xyz)

**= w’xz (A’BD)**

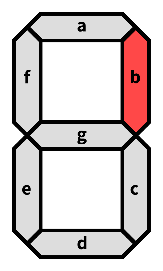
(8, 9)

= (wx’y’z’) + (wx’y’z)

**= wx’y’ (AB’C’)**

a(w, x, y, z) = x’z’ + w’y + xy + w’xz + wx’y’ = B’D’ + A’C + BC + A’BD + AB’C’

b(w, x, y, z) = Σ(0, 1, 2, 3, 4, 7, 8 , 9, 10, 13)

Given the Karnaugh Map below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | yz |  |  |  |  |
| wx |  | 00 | 01 | 11 | 10 |
|  | 00 | m0 | m1 | m3 | m2 |
|  | 01 | m4 | m5 | m7 | m6 |
|  | 11 | m12 | m13 | m15 | m14 |
|  | 10 | m8 | m9 | m11 | m10 |

(0, 1, 2, 3)

= (w’x’y’z’) + (w’x’y’z) + (w’x’yz’) + (w’x’yz)

= (w’x’y’) + (w’x’y)

**= w’x’ (A’B’)**

(0, 2, 8, 10)

= (w’x’y’z’) + (w’x’yz’) + (wx’y’z’) + (wx’yz’)

= (w’x’z’) + (wx’z’)

**= x’z’ (B’D’)**

(0, 4)

= (w’x’y’z’) + (w’xy’z’)

**= w’y’z’ (A’C’D’)**

(3, 7)

= (w’x’yz) + (w’xyz)

**= w’yz (A’CD)**

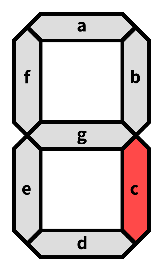
(9, 13)

= (wx’y’z) + (wxy’z)

**= wy’z (AC’D)**

b(w, x, y, z) = w’x’ + x’z’ + w’y’z’ + w’yz + wy’z = A’B’ + B’D’ + A’C’D’ + A’CD + AC’D

c(w, x, y, z) = Σ(0, 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13)

Given the Karnaugh Map below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | yz |  |  |  |  |
| wx |  | 00 | 01 | 11 | 10 |
|  | 00 | m0 | m1 | m3 | m2 |
|  | 01 | m4 | m5 | m7 | m6 |
|  | 11 | m12 | m13 | m15 | m14 |
|  | 10 | m8 | m9 | m11 | m10 |

(0, 1, 4, 5)

= (w’x’y’z’) + (w’x’y’z) + (w’xy’z’) + (w’xy’z)

= (w’x’y’) + (w’xy’)

**= w’y’ (A’C’)**

(1, 3, 5, 7)

= (w’x’y’z) + (w’x’yz) + (w’xy’z) + (w’xyz)

= (w’x’z) + (w’xz)

**= w’z (A’D)**

(1, 5, 9, 13)

= (w’x’y’z) + (w’xy’z) + (wx’y’z) + (wxy’z)

= (w’y’z) + (wy’z)

**= y’z (C’D)**

(4, 5, 6, 7)

= (w’xy’z’) + (w’xy’z) + (w’xyz’) + (w’xyz)

= (w’xy’) + (w’xy)

**= w’x (A’B)**

(8, 9, 10, 11)

= (wx’y’z’) + (wx’y’z) + (wx’yz’) + (wx’yz)

= (wx’y’) + (wx’y)

**= wx’ (AB’)**

c(w, x, y, z) = w’y’ + w’z + y’z + w’x + wx’ = A’C’ + A’D + C’D + A’B + AB’