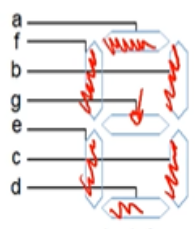
CZ1105 Lab THREE

# 4.2



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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 | 0 | 1 | 1 |
| 01 | 0 | 1 | 1 | 1 |
| 11 | 1 | 0 | 1 | 1 |
| 10 | 1 | 1 | 0 | 1 |

a = x3’x2x0 + x2x1 + x3’x1 + x3x0’ + x3x2’x1’ + x2’x0’

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| b | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 . | 1 | 1 . | 1 |
| 01 | 1 . | 0 | 1 . | 0 |
| 11 | 0 | 1 . | 0 | 0 |
| 10 | 1 | 1 . | 0 | 1 |

b = x3’x2’ + x2’x0’ + x3’x1’x0’ + x3x1’x0 + x3’x1x0

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| c | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 . | 1 . / > | 1 / | 0 |
| 01 | 1 . | 1 . / > | 1 / | 1 |
| 11 | 0 | 1 > | 0 | 0 |
| 10 | 1 | 1 > | 1 | 1 |

c = x3’x1’ + x3’x0 + x1’x0 + x3’x2 + x3x2’

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| d | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 . | 0 | 1 , | 1 . |
| 01 | 0 | 1 > | 0 | 1 |
| 11 | 1 | 1 > | 0 | 1 |
| 10 | 1 | 1 | 1 , | 0 |

d = x3x1’ + x3’x2’x0’ + x2’x1x0 + x2x1’x0 + x2x1x0’

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| e | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 | 0 | 0 | 1 |
| 01 | 0 | 0 | 0 | 1 |
| 11 | 1 , | 1 , | 1 . , | 1 . , |
| 10 | 1 | 0 | 1 . | 1 . |

e = x1x0’ + x3x1 + x3x2 + x2’x0’

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| f | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 1 | 0 | 0 | 0 |
| 01 | 1 > , | 1 > | 0 | 1 , |
| 11 | 1 , | 0 | 1 | 1 , |
| 10 | 1 . | 1 . | 1 . | 1 . |

f = x1’x0’ + x3x1 + x3’x2x1’ + x3x2’ + x2x0’

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| g | | x1, x0 | | | |
| 00 | 01 | 11 | 10 |
| x3, x2 | 00 | 0 | 0 | 1 x | 0 x |
| 01 | 1 > | 1 > | 1 | 1 |
| 11 | 1 | 1 . | 1 . | 1 |
| 10 | 1 | 1 . | 1 . x | 1 x |

g = x3x2’ + x1x0’ + x3’x2x1’ + x3x0 + x2’x1

# 4.3

a = x3’x2x0 + x2x1 + x3’x1 + x3x0’ + x3x2’x1’ + x2’x0’

assign a = ~x[3]&x[2]&x[0] | x[2]&x[1] | ~x[3]&x[1] | x[3]&~x[0] | x[3]&~x[2]&~x[1] | ~x[2]&~x[0];

b = x3’x2’ + x2’x0’ + x3’x1’x0’ + x3x1’x0 + x3’x1x0

assign b = ~x[3]&~x[2] | ~x[2]&~x[0] | ~x[3]&~x[1]&~x[0] | x[3]&~x[1]&x[0] | ~x[3]&x[1]&x[0];

c = x3’x1’ + x3’x0 + x1’x0 + x3’x2 + x3x2’

assign c = ~x[3]&~x[1] | ~x[3]&x[0] | ~x[1]&x[0] | ~x[3]&x[2] | x[3]&~x[2];

d = x3x1’ + x3’x2’x0’ + x2’x1x0 + x2x1’x0 + x2x1x0’

assign d = x[3]&~x[1] | ~x[3]&~x[2]&~x[0] | ~x[2]&x[1]&x[0] | x[2]&~x[1]&x[0] | x[2]&x[1]&~x[0];

e = x1x0’ + x3x1 + x3x2 + x2’x0’

assign e = x[1]&~x[0] | x[3]&x[1] | x[3]&x[2] | ~x[2]&~x[0];

f = x1’x0’ + x3x1 + x3’x2x1’ + x3x2’ + x2x0’

assign f = ~x[1]&~x[0] | x[3]&x[1] | ~x[3]&x[2]&~x[1] | x[3]&~x[2] | x[2]&~x[0];

g = x3x2’ + x1x0’ + x3’x2x1’ + x3x0 + x2’x1

assign g = x[3]&~x[2] | x[1]&~x[0] | ~x[3]&x[2]&~x[1] | x[3]&x[0] | ~x[2]&x[1];

# 5.2.2

They are exactly the same, but is not necessarily the case if one can obtain an equally simplified expression from the K map