
COMP: 106
LOGIC DESIGN
2023 PROJECT ASSIGNMENT

TEAM #18

1) MOHAMED HESHAM MOHAMED
2) MOHAMED YASSER MOHAMED
3) ALI MAGDY ABO EL-MAHASAN
4) MAHMOUD YOUSSOF RASLAN
5) AMR KHALED ISMAIL

Special thanks to Dr. Naglaa M. Reda

Q: Design the code converter that accepts the BCD code of a decimal digit and outputs its equivalent 8, 4, 2, 1, augmented with negative sign bit.

Step 1: **There are 4 inputs A, B, C, D, and 5 outputs *w*, *x*, *y*, *z*, *s*.**

Step 2: **The truth table is** ⇒

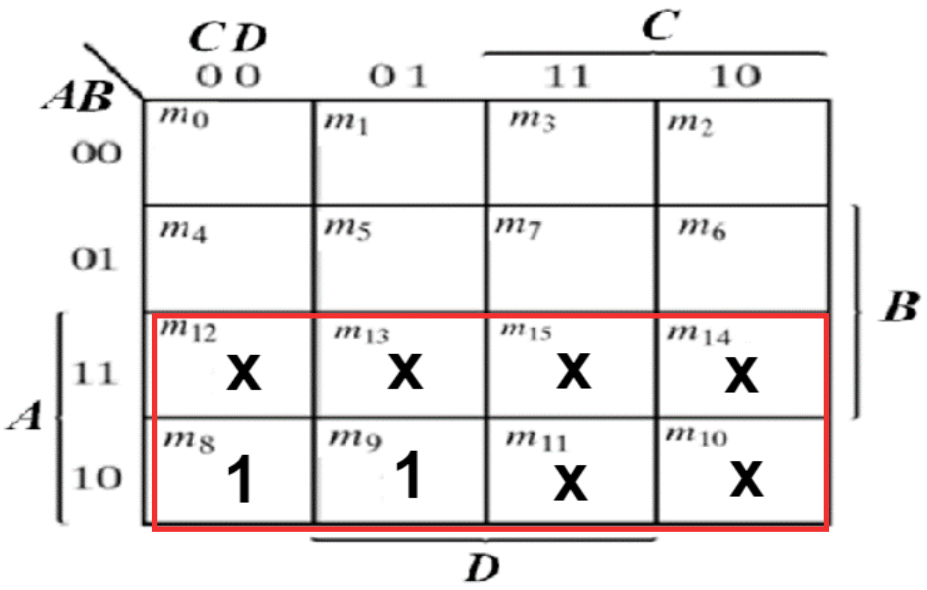
Step 3: Boolean functions

$w = \sum(8, 9)$
$x = \sum(4, 5, 6, 7)$
$y = \sum(2, 3, 6, 7)$
$z = \sum(1, 3, 5, 7, 9)$
$s = \sum(1, 2, 3, 4, 5, 6, 7, 8, 9)$

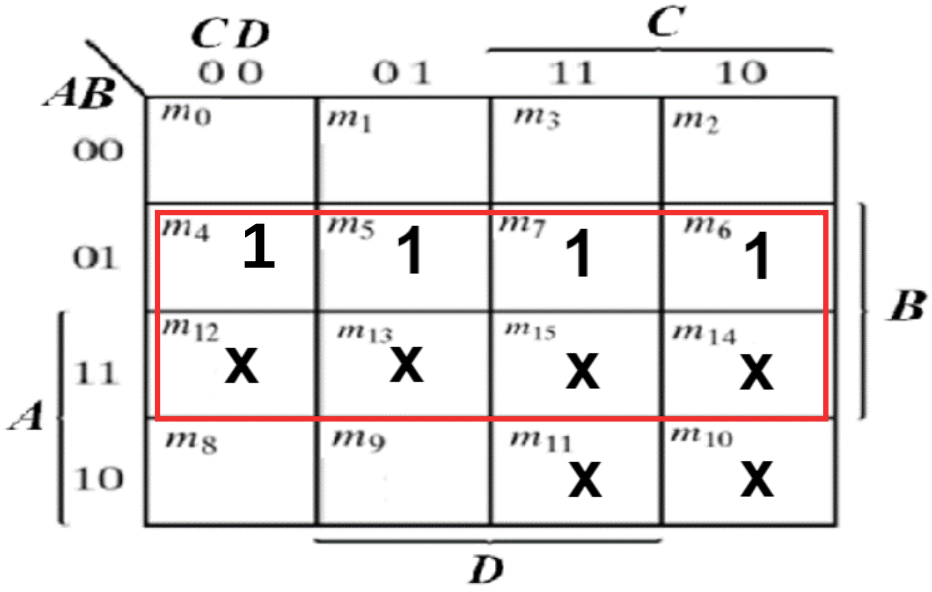
Input BCD					Output 8,4,2,1				Sign
A	B	C	D		w	x	y	z	s
0	0	0	0		0	0	0	0	0
0	0	0	1		0	0	0	1	1
0	0	1	0		0	0	1	0	1
0	0	1	1		0	0	1	1	1
0	1	0	0		0	1	0	0	1
0	1	0	1		0	1	0	1	1
0	1	1	0		0	1	1	0	1
0	1	1	1		0	1	1	1	1
1	0	0	0		1	0	0	0	1
1	0	0	1		1	0	0	1	1

Step 4: Simplified boolean functions

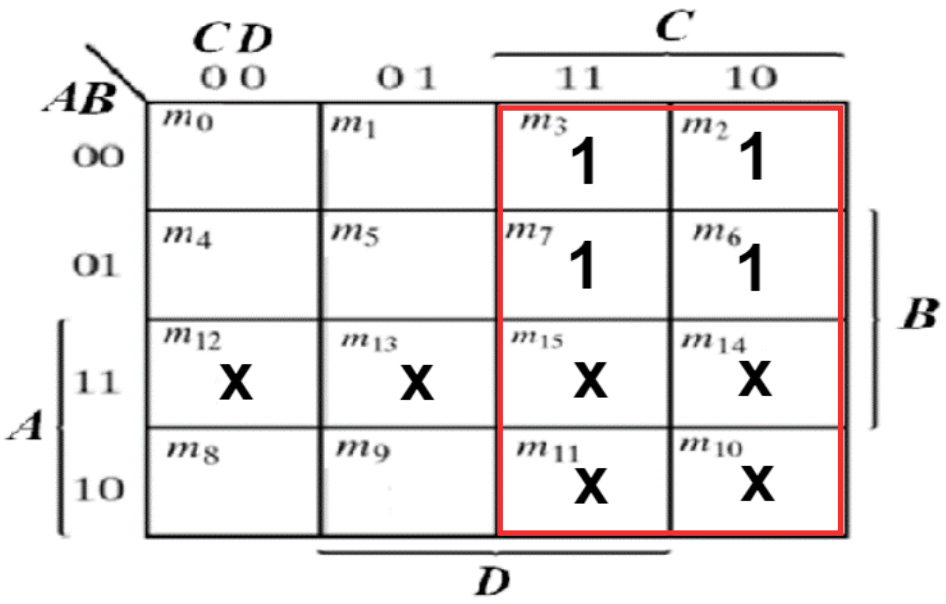
w=A



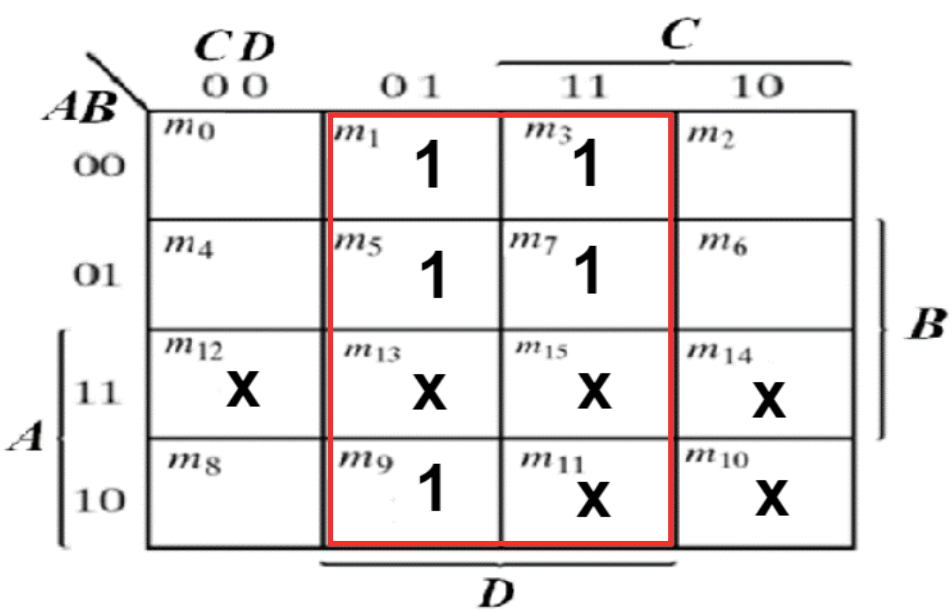
x=B



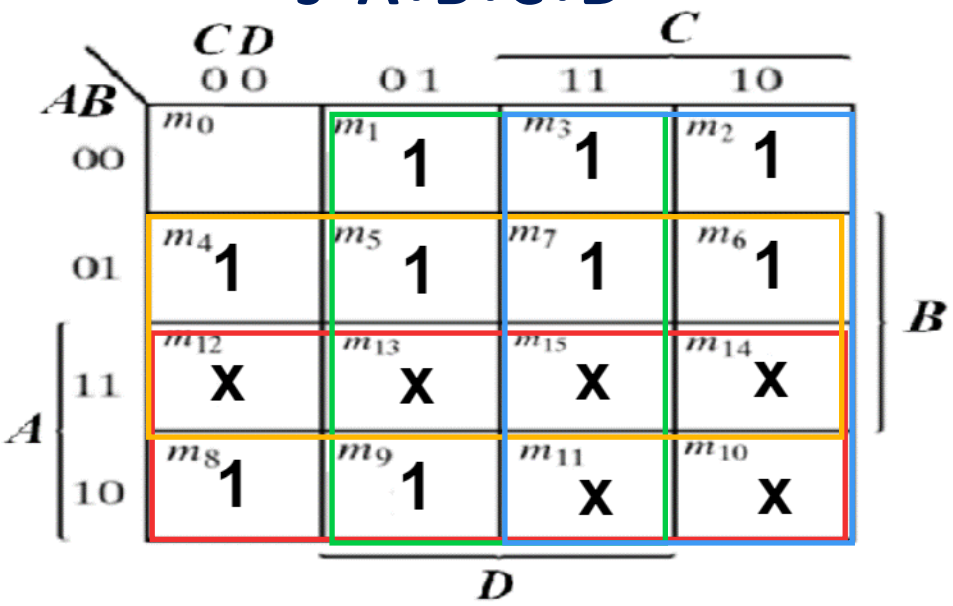
y=C


CD
AB
C
00
01
11
10
A
B
D
m0
m1
m3
1
m2
1
m4
m5
m7
1
m6
1
m12
X
m13
X
m15
X
m14
X
m8
m9
m11
X
m10
X

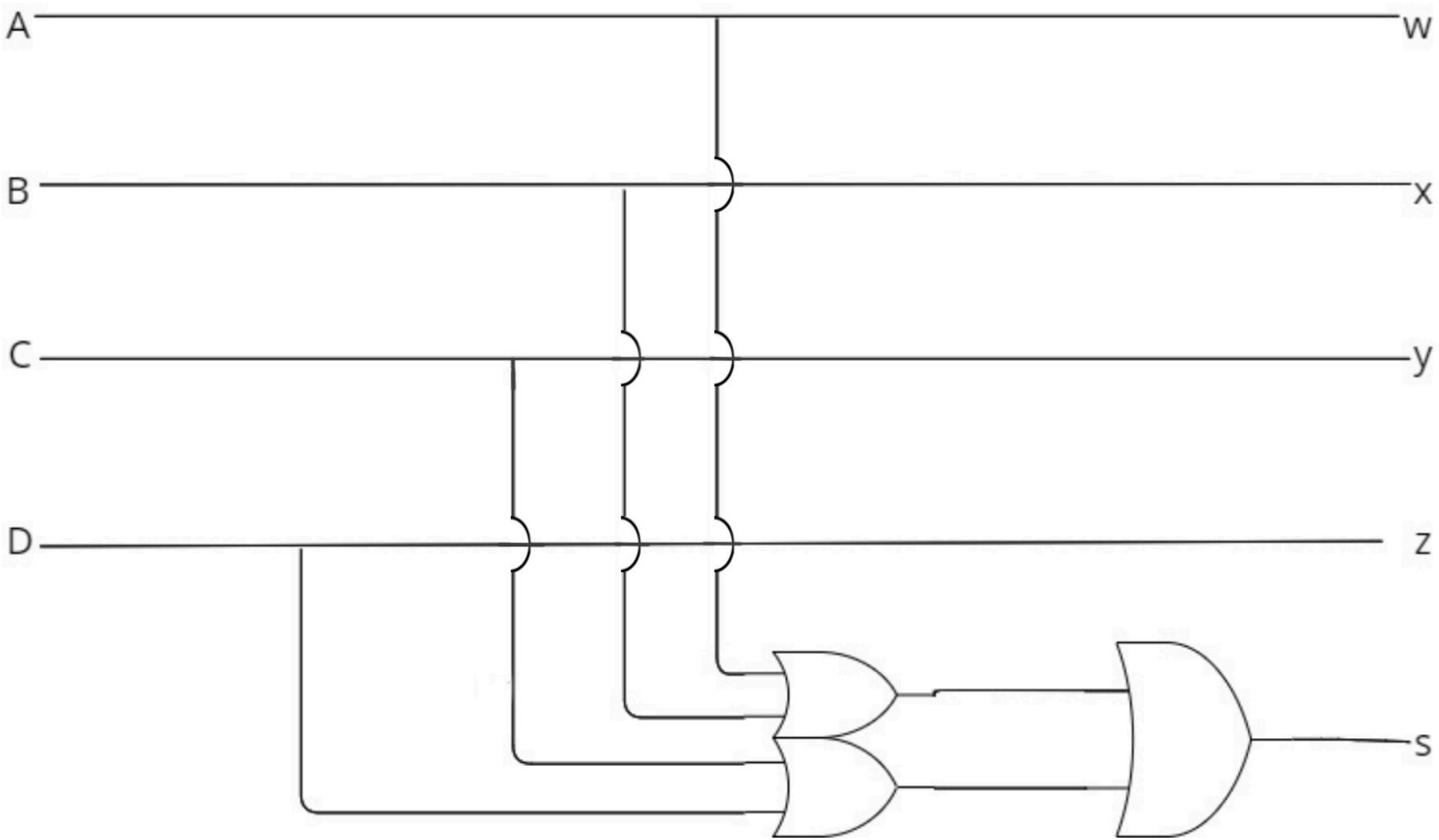
z=D


CD
AB
C
00
01
11
10
A
B
D
m0
m1
1
m3
1
m2
m4
m5
1
m7
1
m6
m12
X
m13
X
m15
X
m14
X
m8
m9
1
m11
X
m10
X

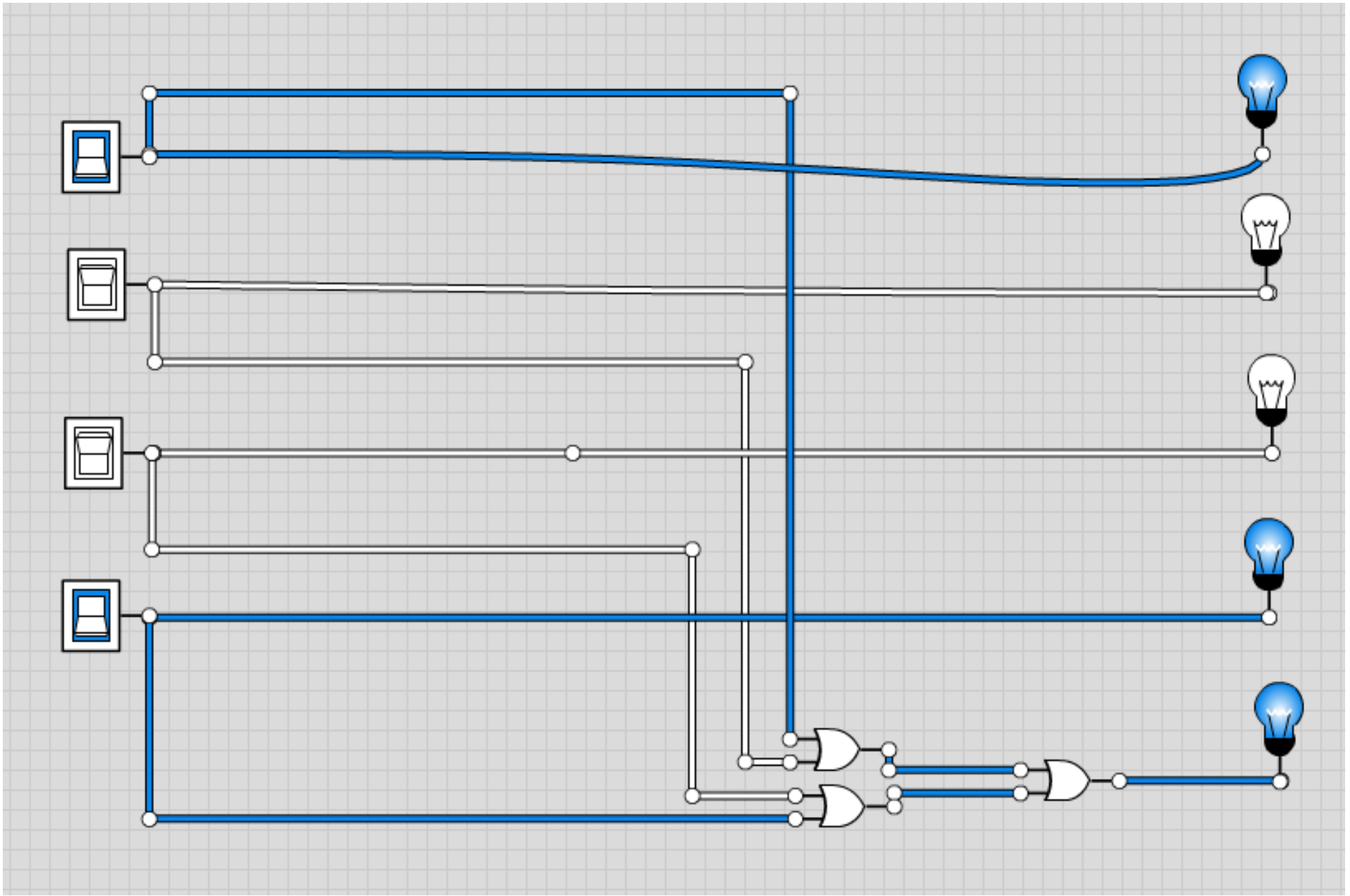
s=A+B+C+D


CD
AB
C
00
01
11
10
A
B
D
m0
m1
1
m3
1
m2
1
m4
1
m5
1
m7
1
m6
1
m12
X
m13
X
m15
X
m14
X
m8
1
m9
1
m11
X
m10
X

Step 5: The logic diagram is



Step 6: The simulator for design is




THANK
YOU