

ASCII Table (7-bit)

(ASCII = American Standard Code for Information Interchange)

Decimal	Octal	Hex	Binary	Value (Keyboard)
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Choi = \$43 \$68 \$6F \$69

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Choi = \$43 \$68 \$6F \$69

0100 0011 => 'C' = \$43

0100 0011 => MSB odd parity

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Decimal	Octal	Hex	Binary	Value (Keyboard)
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Choi = \$43 \$68 \$6F \$69

0100 0011 => 'C' = \$43

0100 0011 => MSB odd parity

1100 0011 => MSB even parity

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Decimal	Octal	Hex	Binary	Value (Keyboard)
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-----	-----	---	-----	-----
-------	-------	-----	-------	-------

Choi = \$43 \$68 \$6F \$69

0100 0011 => 'C' = \$43

0100 0011 => MSB odd parity

1100 0011 => MSB even parity

0110 1111 => 'o' = \$6F

1110 1111 => MSB odd parity

0110 1111 => MSB even parity

100 0011 => 'C' = \$43

0100 0011 => MSB odd parity

1100 0011 => MSB even parity

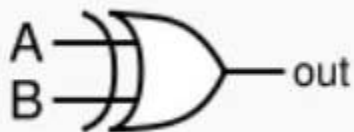
110 1111 => 'o' = \$6F

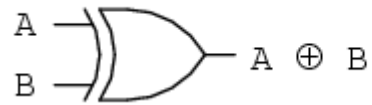
1110 1111 => MSB odd parity

0110 1111 => MSB even parity

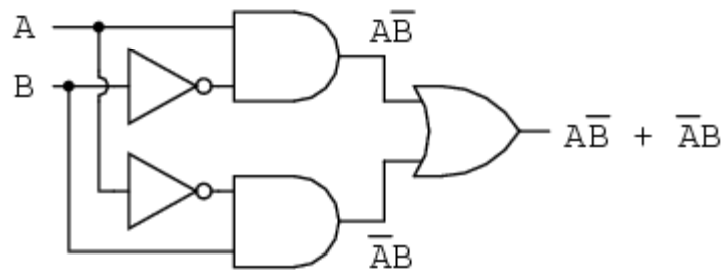
Parity Circuit

$$D7 \oplus D6 \oplus D5 \oplus D4 \oplus D3 \oplus D2 \oplus D1 \oplus D0 = P$$

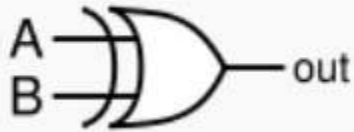
<u>XOR</u>		$A \oplus B$	INPUT		OUT
			A	B	A XOR B
			0	0	0
			0	1	1
			1	0	1
			1	1	0



... is equivalent to ...



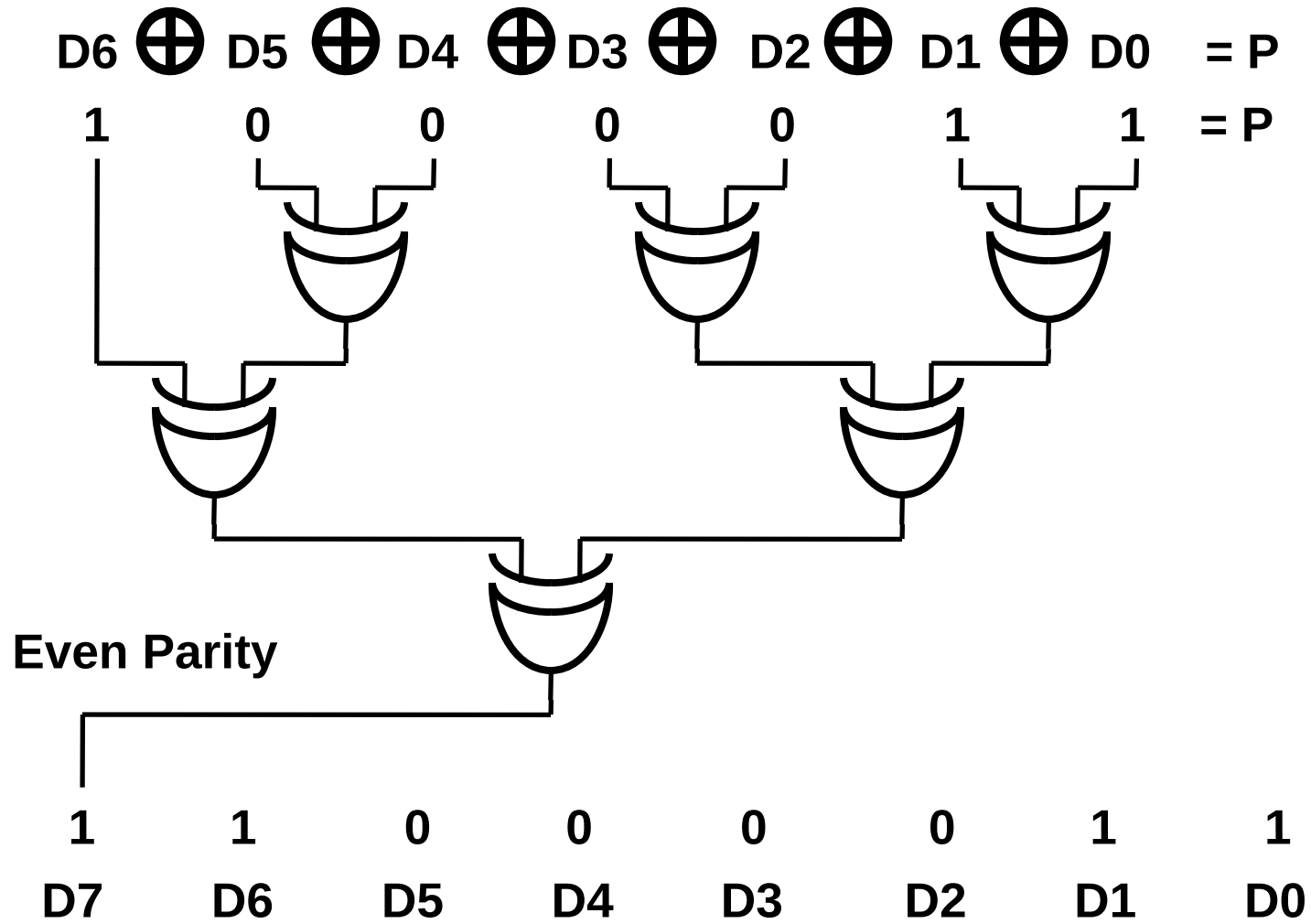
$$A \oplus B = A\bar{B} + \bar{A}B$$

	INPUT		OUT
	A	B	A XOR B
XOR 	0	0	0
	0	1	1
	1	0	1
	1	1	0

0100 0011 => 'C' = \$43

0100 0011 => MSB odd parity

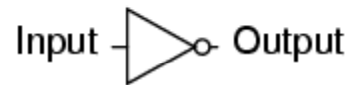
1100 0011 => MSB even parity



Boolean Algebra (Binary Logic)

Timing

NOT gate truth table

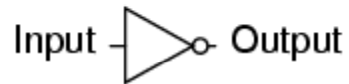


Input	Output
0	1
1	0

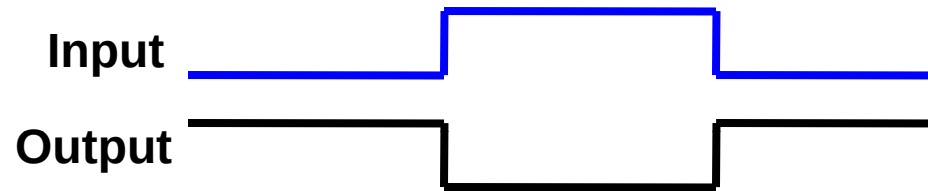
Boolean Algebra (Binary Logic)

Timing

NOT gate truth table



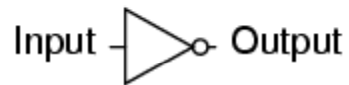
Input	Output
0	1
1	0



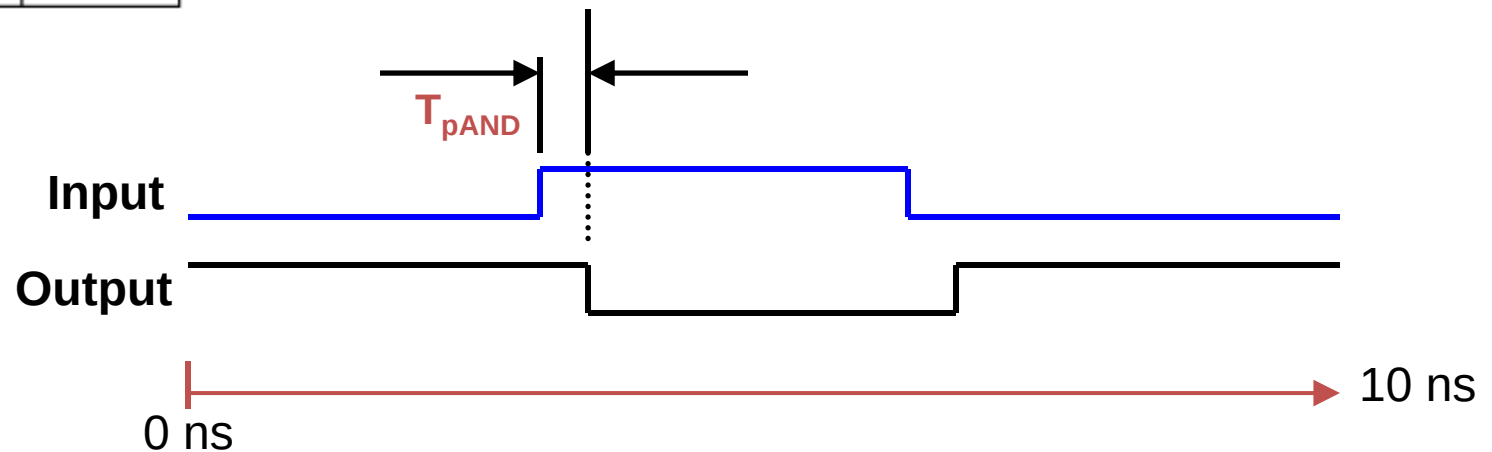
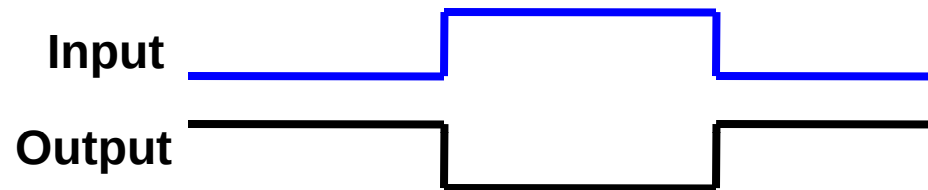
Boolean Algebra (Binary Logic)

Timing

NOT gate truth table

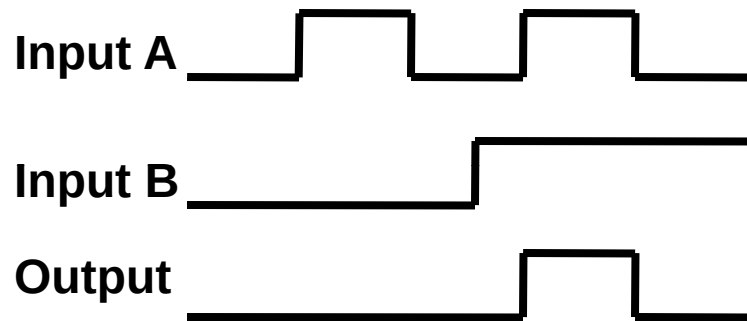


Input	Output
0	1
1	0

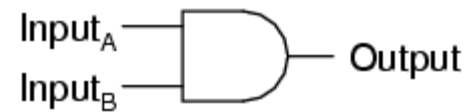


Boolean Algebra (Binary Logic)

Timing



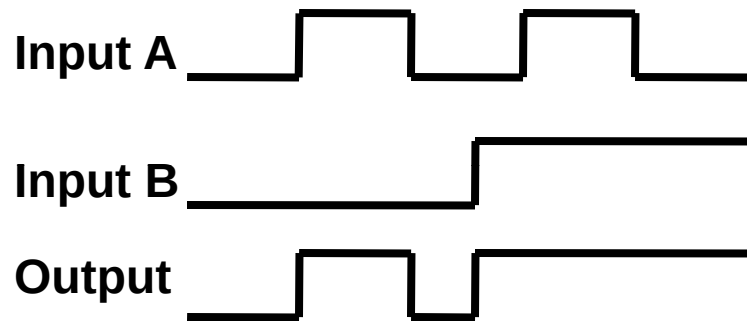
2-input AND gate



A	B	Output
0	0	0
0	1	0
1	0	0
1	1	1

Boolean Algebra (Binary Logic)

Timing



2-input OR gate



A	B	Output
0	0	0
0	1	1
1	0	1
1	1	1

Converting truth table to Boolean equation

a	b	c	d	z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Converting truth table to Boolean equation

a	b	c	d	z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Converting truth table to Boolean equation

$$\begin{aligned} z = & a'b'cd \\ & + a'bcd \\ & + ab'cd \\ & + abc'd' \\ & + abc'd \\ & + abcd' \\ & + abcd \end{aligned}$$

a	b	c	d	z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

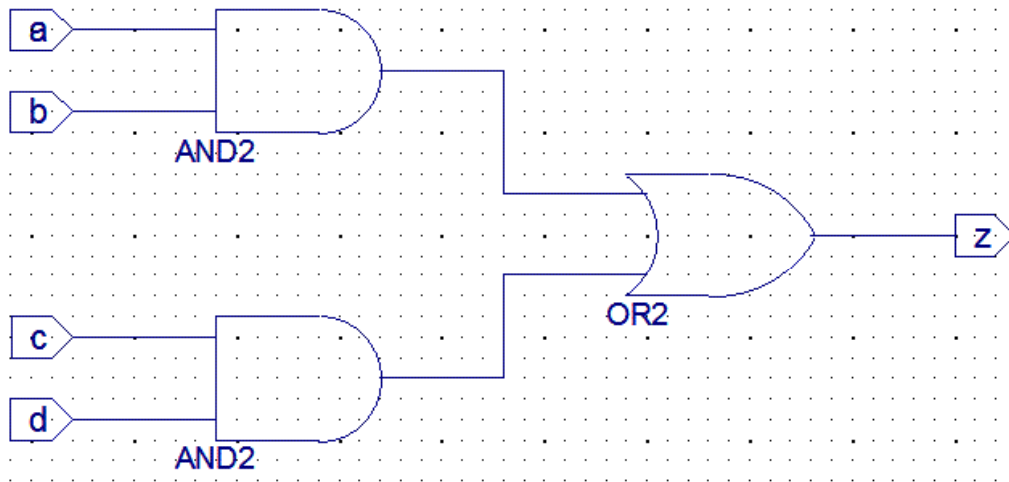
Converting truth table to Boolean equation

$$\begin{aligned} z &= a'b'cd \\ &+ a'bcd \\ &+ ab'cd \\ &+ abc'd' \\ &+ abc'd \\ &+ abcd' \\ &+ abcd \\ &= ab + cd \end{aligned}$$

a	b	c	d	z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Converting truth table to Boolean equation

$$z = ab + cd$$



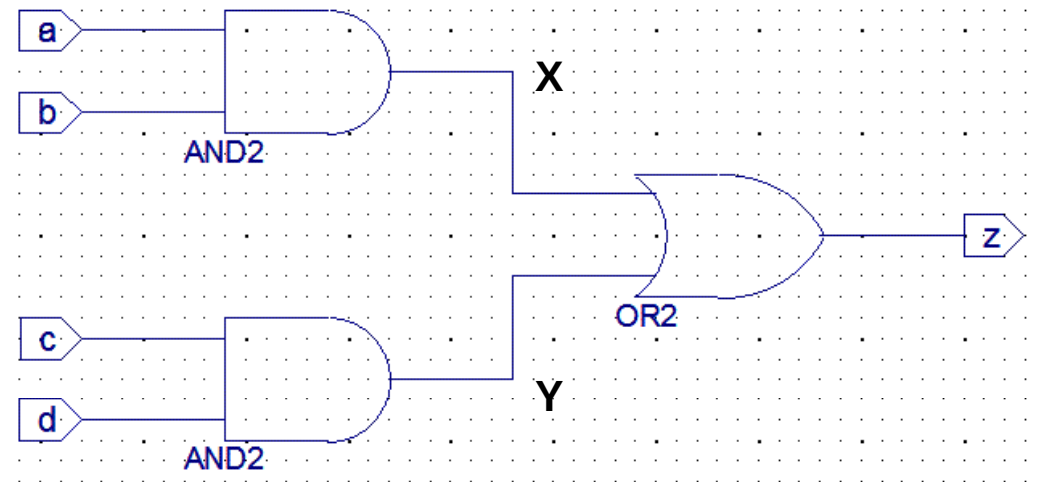
a	b	c	d	z
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1

Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$



Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

[illegible]

Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

a	b	c	d	X	Y	z
0	0	0	0			
0	0	0	1			
0	0	1	0			
0	0	1	1			
0	1	0	0			
0	1	0	1			
0	1	1	0			
0	1	1	1			
1	0	0	0			
1	0	0	1			
1	0	1	0			
1	0	1	1			
1	1	0	0			
1	1	0	1			
1	1	1	0			
1	1	1	1			

Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

a	b	c	d	X	Y	z
0	0	0	0	0		
0	0	0	1	0		
0	0	1	0	0		
0	0	1	1	0		
0	1	0	0	0		
0	1	0	1	0		
0	1	1	0	0		
0	1	1	1	0		
1	0	0	0	0		
1	0	0	1	0		
1	0	1	0	0		
1	0	1	1	0		
1	1	0	0	1		
1	1	0	1	1		
1	1	1	0	1		
1	1	1	1	1		

Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

a	b	c	d	X	Y	z
0	0	0	0	0	0	
0	0	0	1	0	0	
0	0	1	0	0	0	
0	0	1	1	0	1	
0	1	0	0	0	0	
0	1	0	1	0	0	
0	1	1	0	0	0	
0	1	1	1	0	1	
1	0	0	0	0	0	
1	0	0	1	0	0	
1	0	1	0	0	0	
1	0	1	1	0	1	
1	1	0	0	1	0	
1	1	0	1	1	0	
1	1	1	0	1	0	
1	1	1	1	1	1	

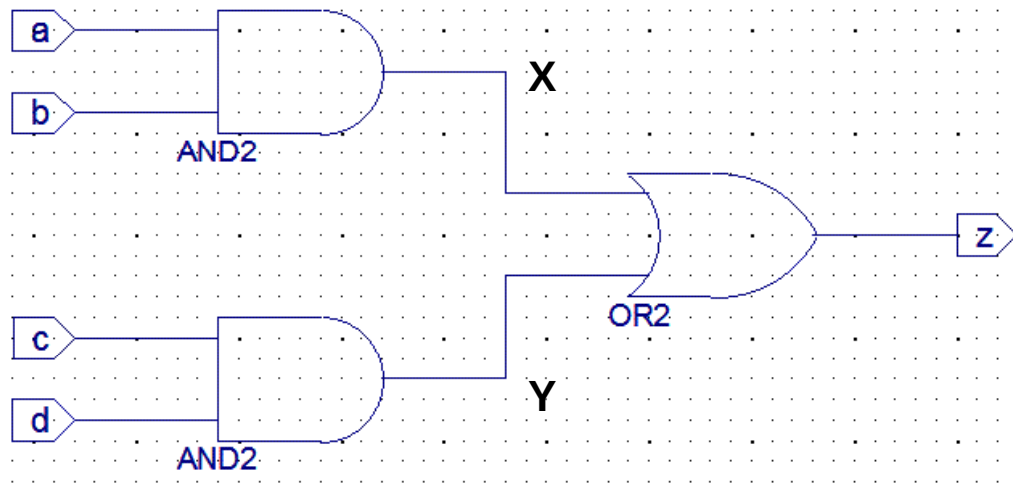
Converting Boolean Equation to truth table

$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

a	b	c	d	X	Y	z
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	1	0	0	0	0
0	0	1	1	0	1	1
0	1	0	0	0	0	0
0	1	0	1	0	0	0
0	1	1	0	0	0	0
0	1	1	1	0	1	1
1	0	0	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	0	0	0
1	0	1	1	0	1	1
1	1	0	0	1	0	1
1	1	0	1	1	0	1
1	1	1	0	1	0	1
1	1	1	1	1	1	1



$$X = ab$$

$$Y = cd$$

$$z = X + Y = ab + cd$$

a	b	c	d	X	Y	z
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	1	0	0	0	0
0	0	1	1	0	1	1
0	1	0	0	0	0	0
0	1	0	1	0	0	0
0	1	1	0	0	0	0
0	1	1	1	0	1	1
1	0	0	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	0	0	0
1	0	1	1	0	1	1
1	1	0	0	1	0	1
1	1	0	1	1	0	1
1	1	1	0	1	0	1
1	1	1	1	1	1	1

