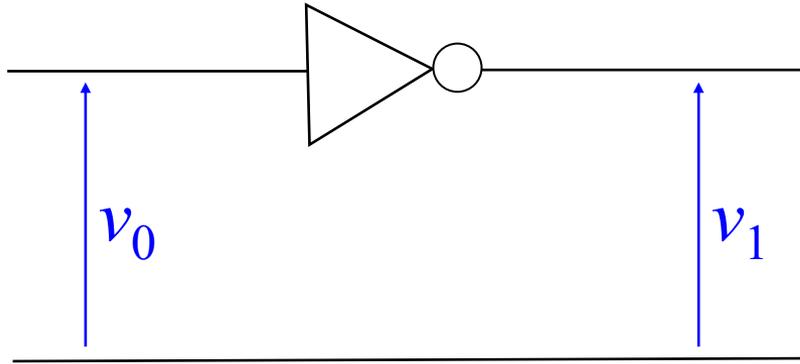


デジタル回路講義資料

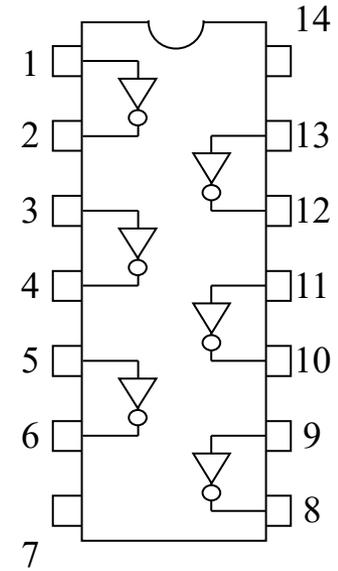
第2回 AND, OR, NOT回路

担当：古橋武

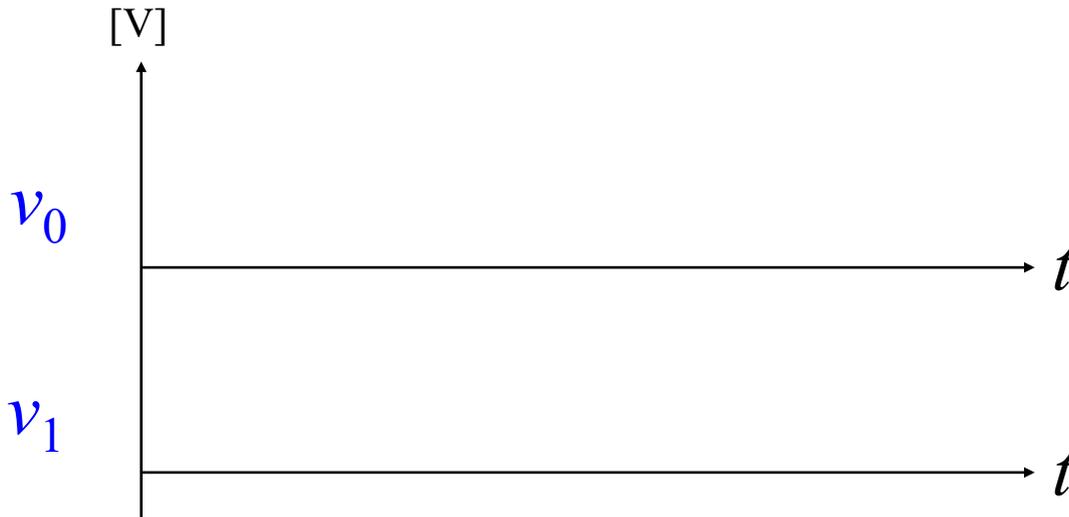
論理素子 NOT回路



4.5V =

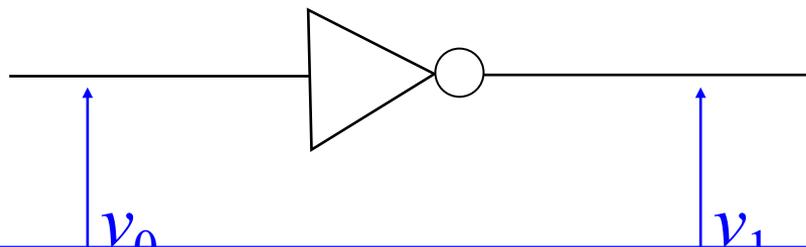


74HC04AP
NOT回路

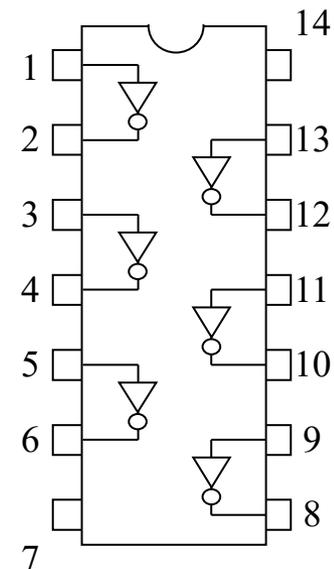
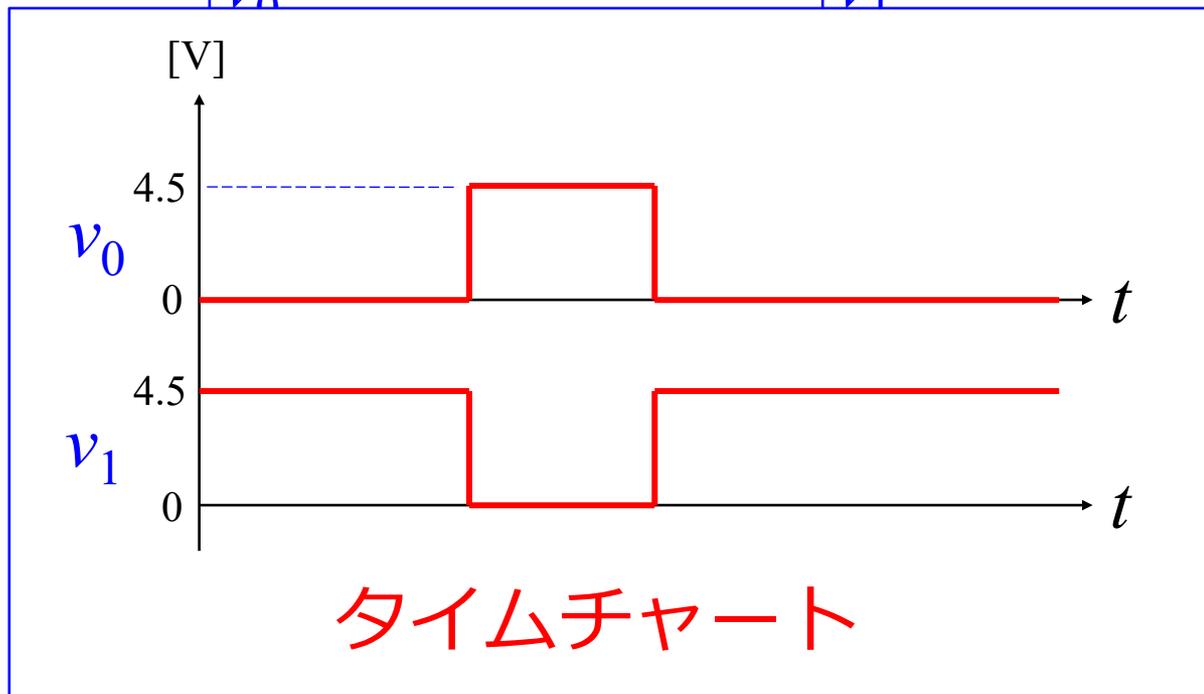


タイムチャート

論理素子 NOT回路

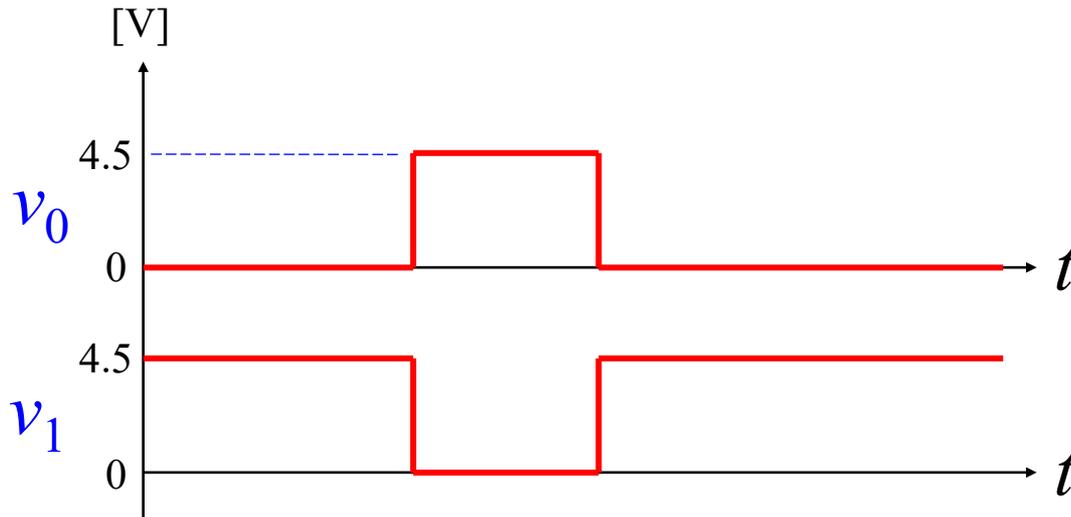
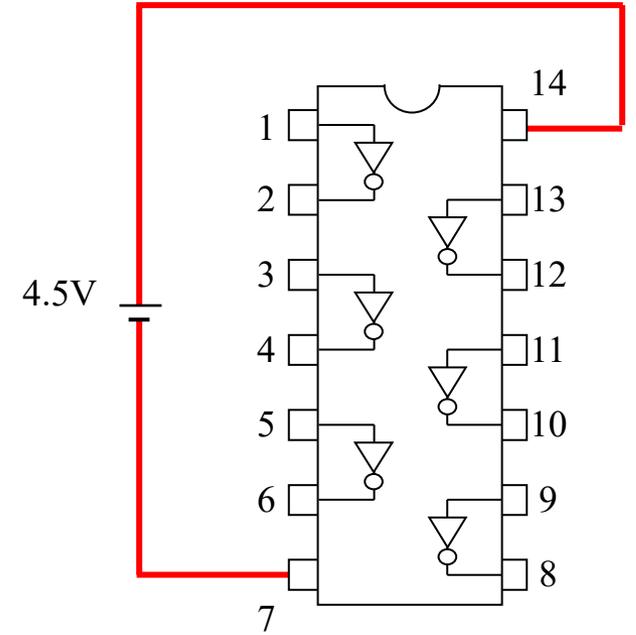
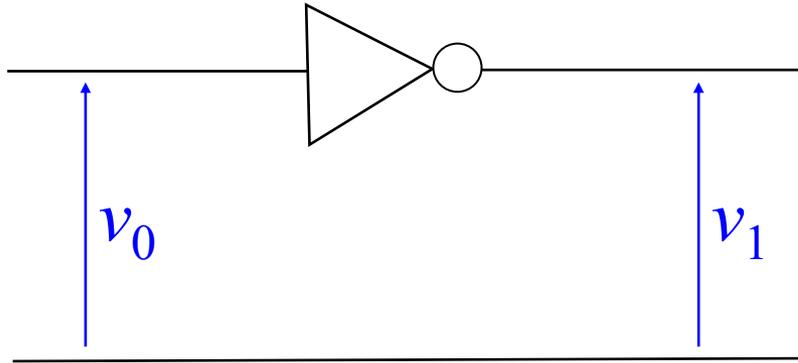


4.5V =



74HC04AP
NOT回路

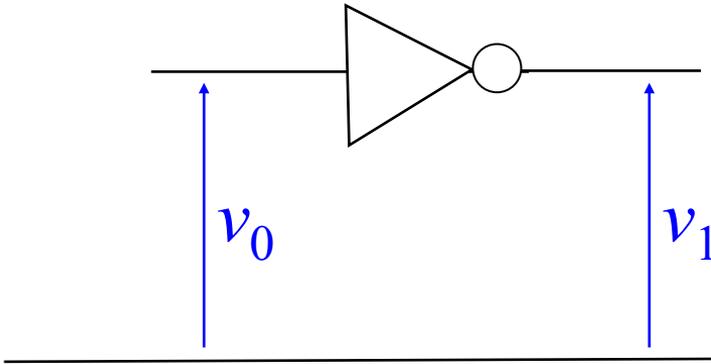
論理素子 NOT回路



74HC04AP
NOT回路

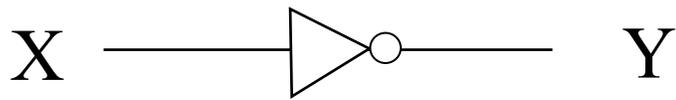
タイムチャート

実際の回路



SW	v_0 [V]	v_1 [V]
OFF		
ON		

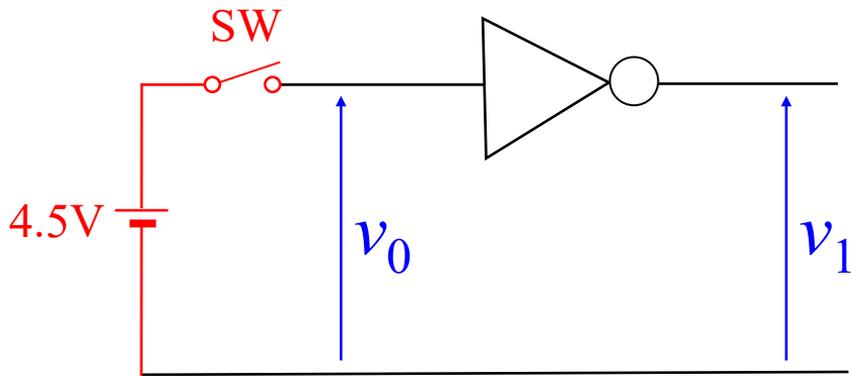
記号表示



$$Y =$$

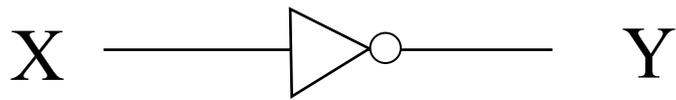
X	Y

実際の回路



SW	v_0 [V]	v_1 [V]
OFF		
ON		

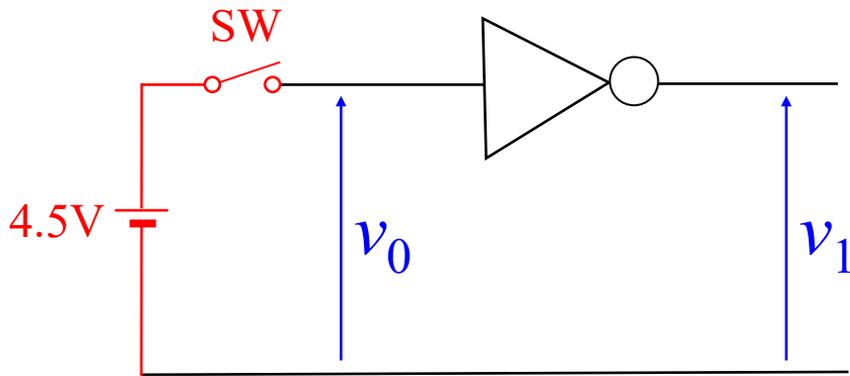
記号表示



$Y =$

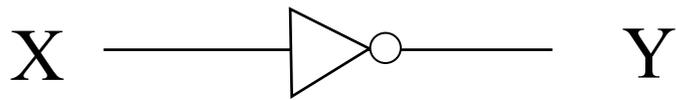
X	Y

実際の回路



SW	v_0 [V]	v_1 [V]
OFF	0	4.5
ON		

記号表示

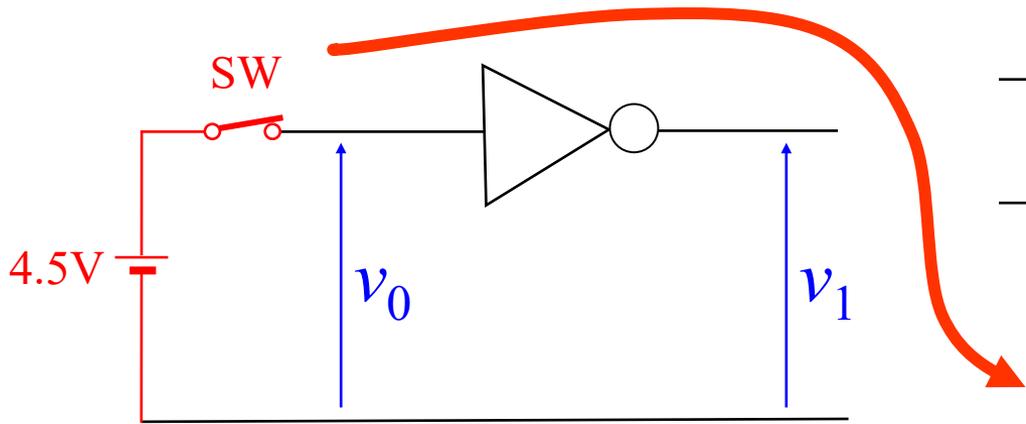


$Y =$

X	Y

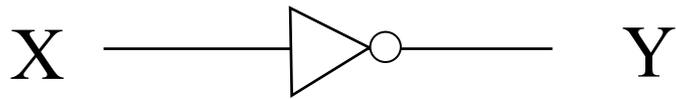
スイッチ投入

実際の回路



SW	v_0 [V]	v_1 [V]
OFF	0	4.5
ON	4.5	0

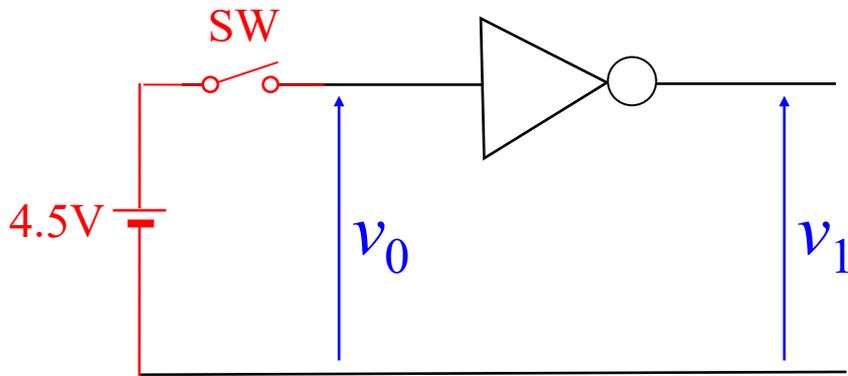
記号表示



$Y =$

X	Y

実際の回路

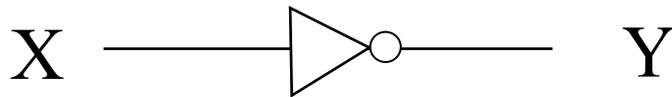


SW	v_0 [V]	v_1 [V]
OFF	0	4.5
ON	4.5	0

真理値表

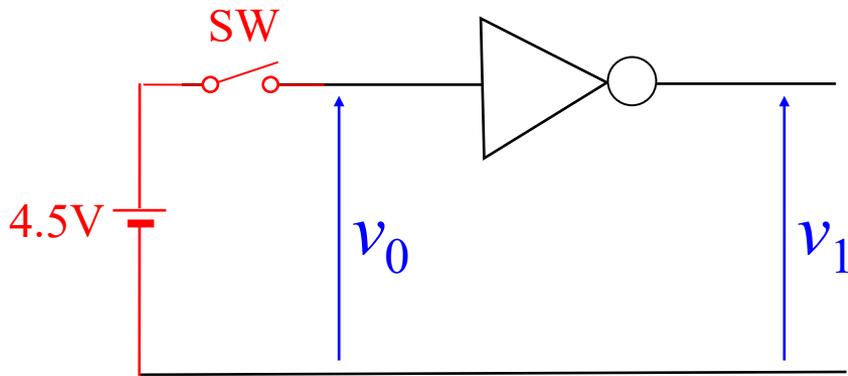
X	Y
0	1
1	0

記号表示



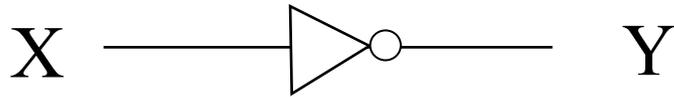
$$Y = \neg X$$

実際の回路



SW	v_0 [V]	v_1 [V]
OFF	0	4.5
ON	4.5	0

記号表示

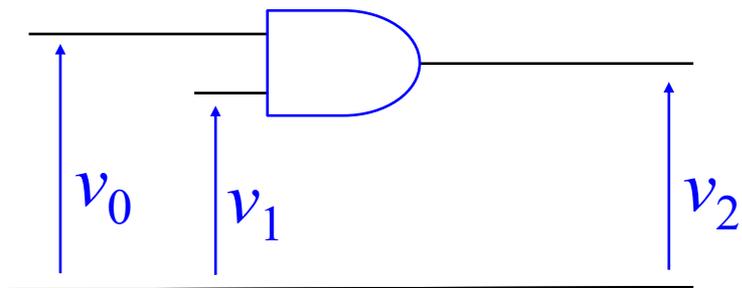


$$Y = \overline{X}$$

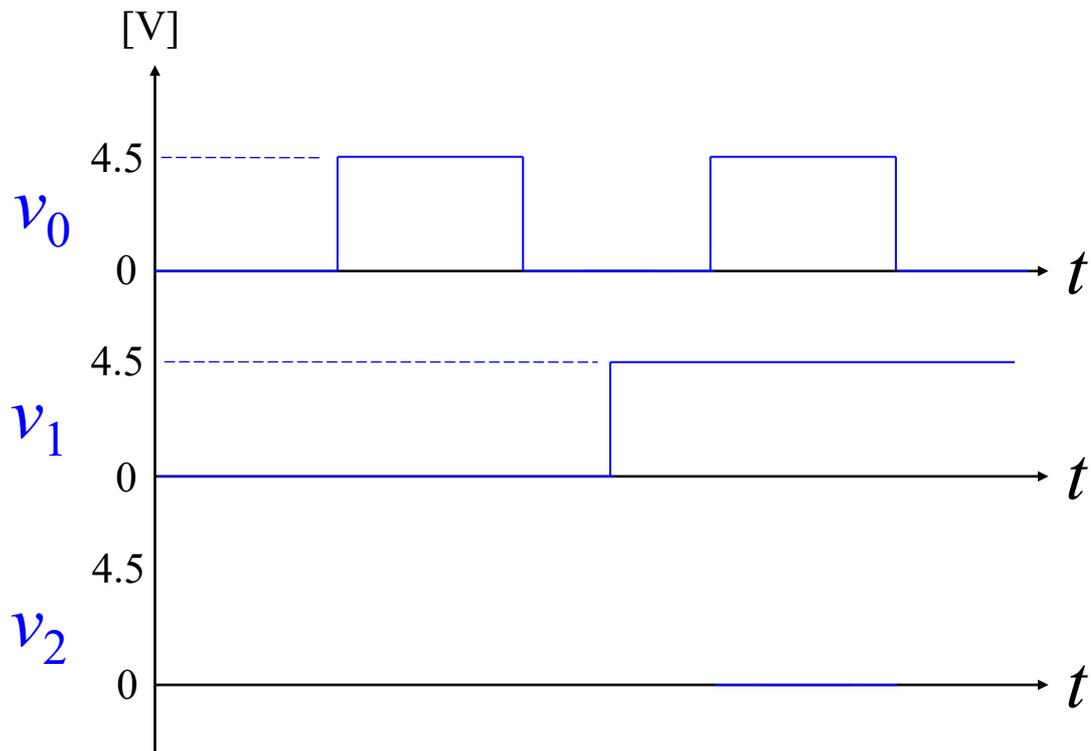
真理値表

X	Y
0	1
1	0

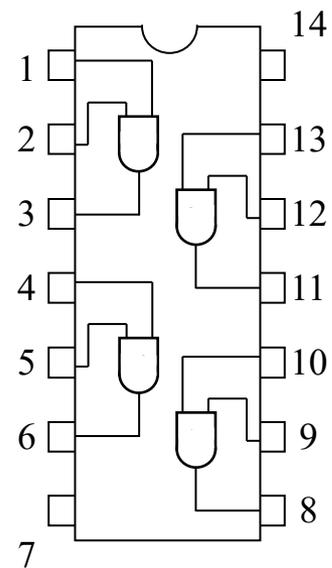
2.1.2 AND回路



4.5V 

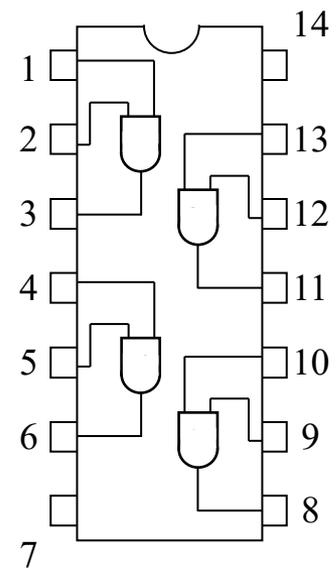
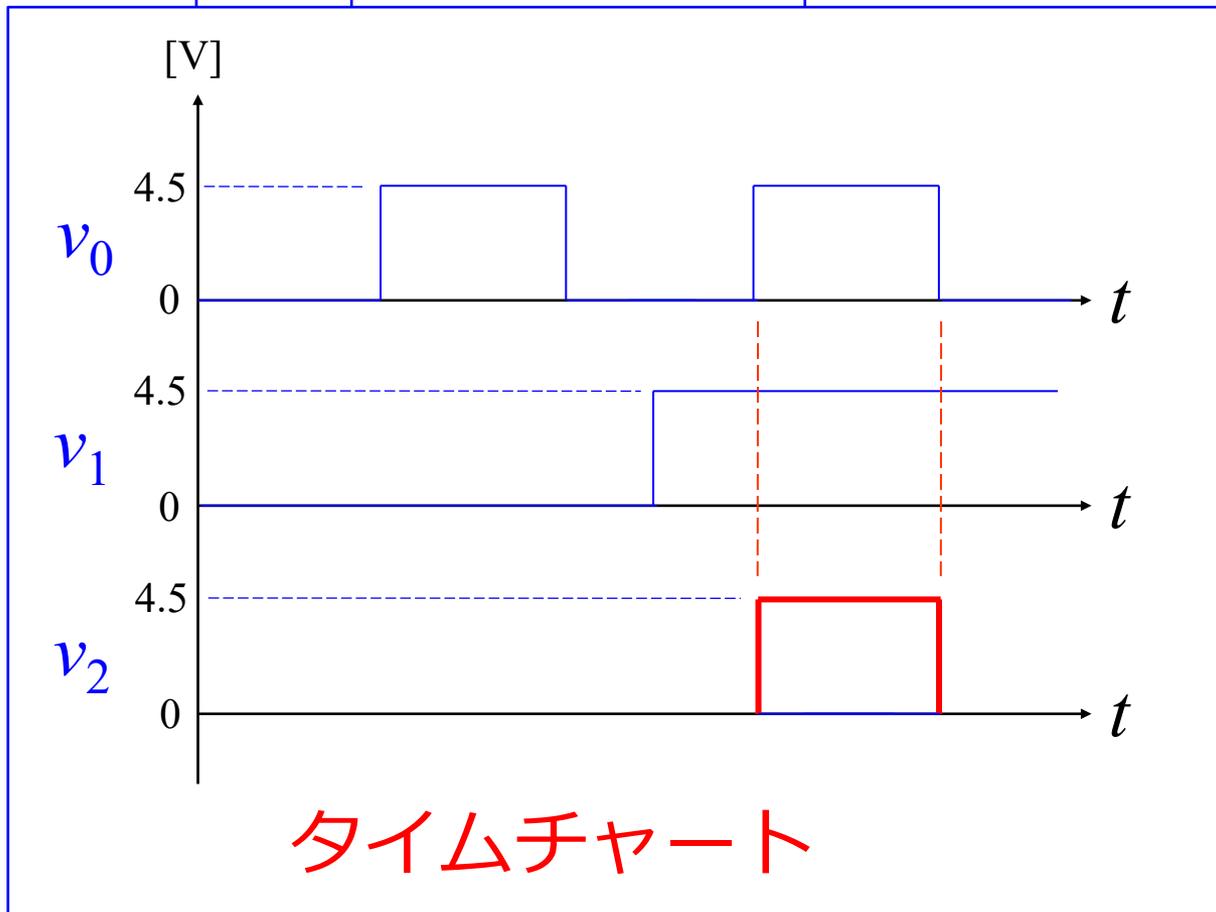
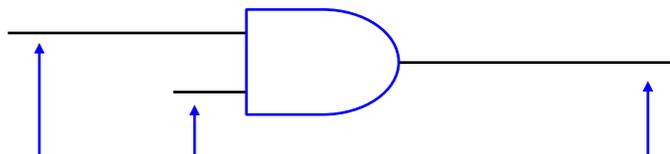


タイムチャート



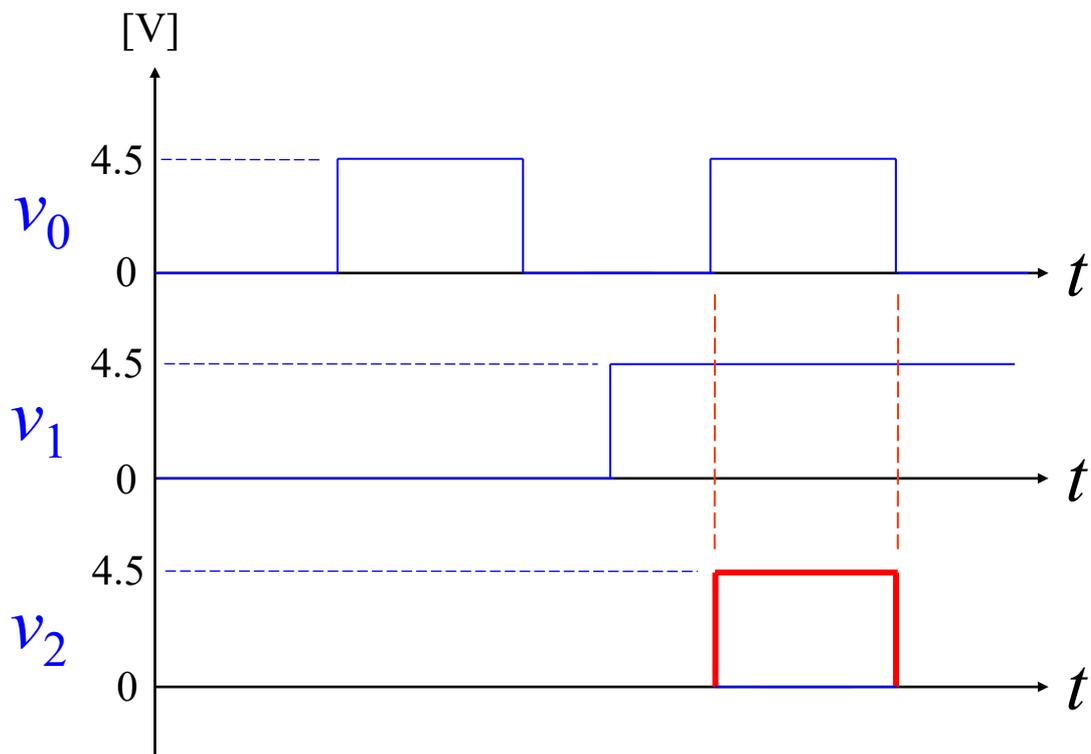
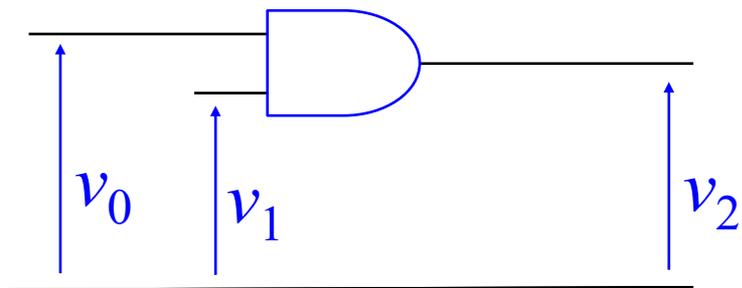
TC74HC08AP
AND回路

AND回路

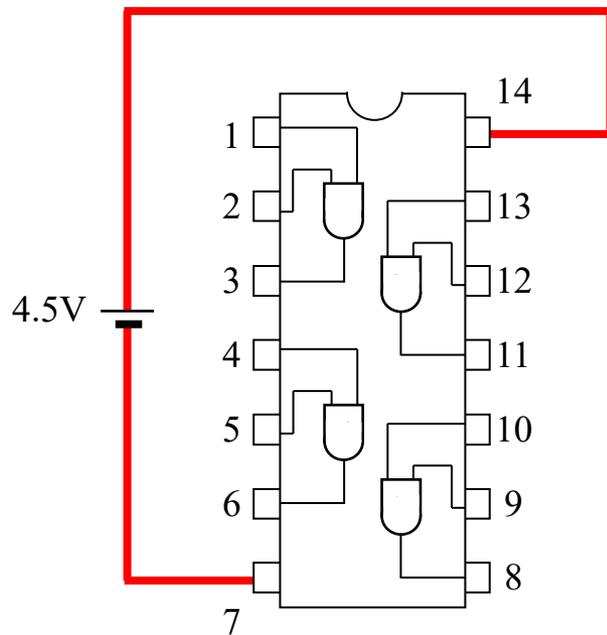


TC74HC08AP
AND回路

AND回路

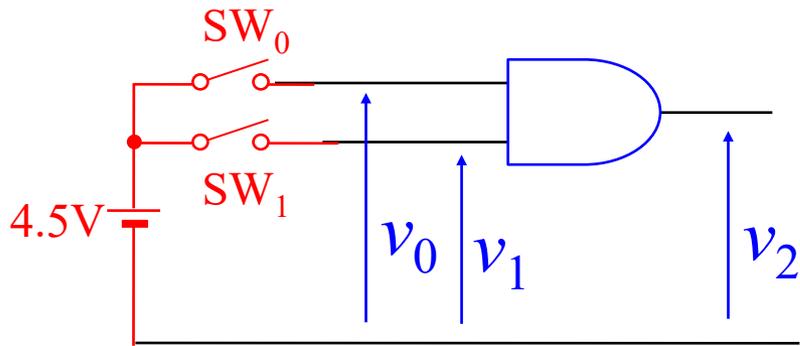


タイムチャート



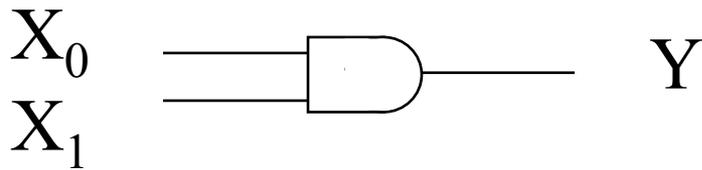
TC74HC08AP
AND回路

実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
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記号表示

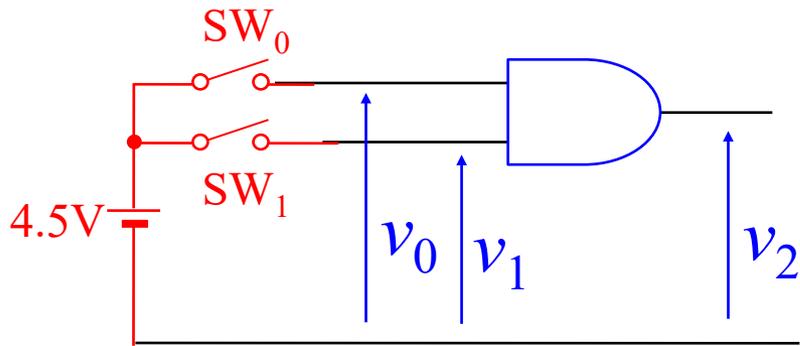


Y =

真理値表

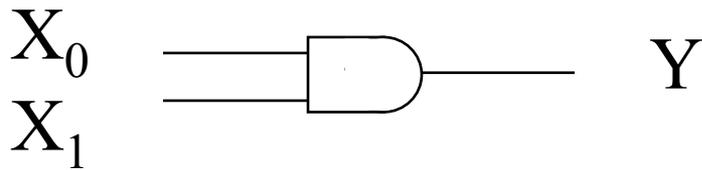
X ₁	X ₀	Y
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実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0

記号表示

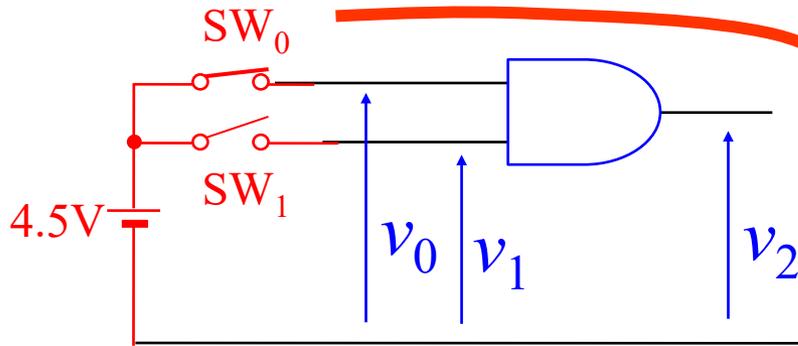


$Y =$

真理値表

X ₁	X ₀	Y
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実際の回路 スイッチ投入

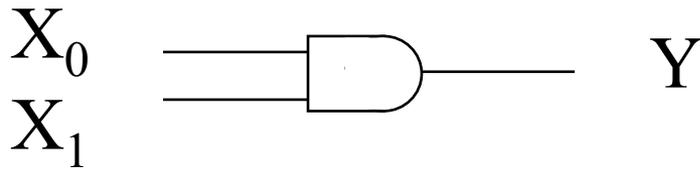


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0

真理値表

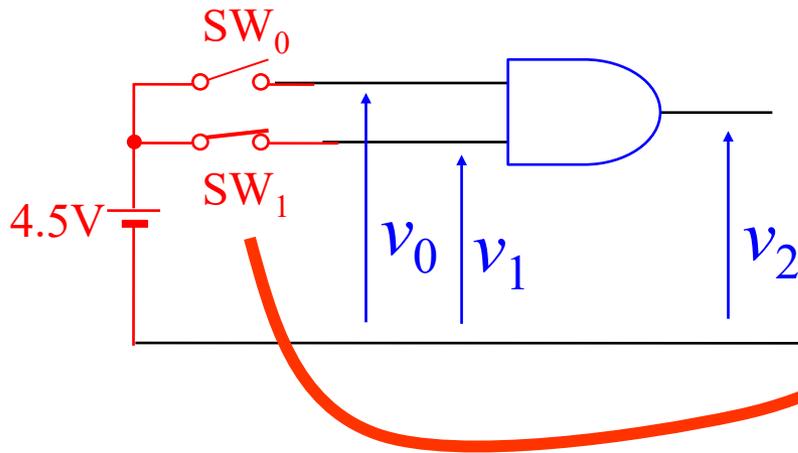
X_1	X_0	Y
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記号表示



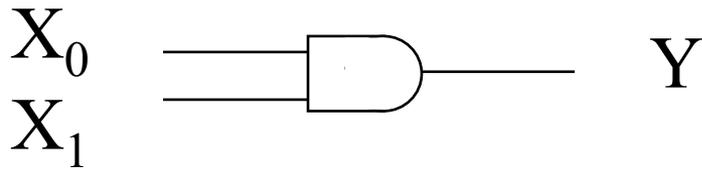
$Y =$

実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0

記号表示

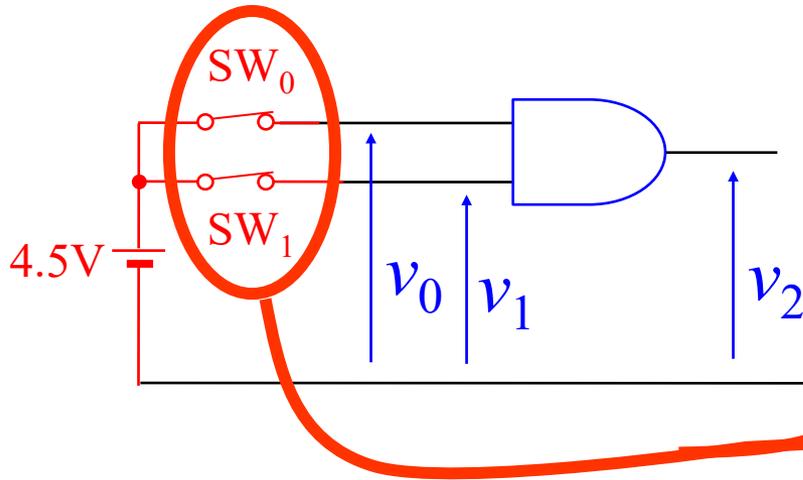


Y =

真理値表

X ₁	X ₀	Y
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実際の回路

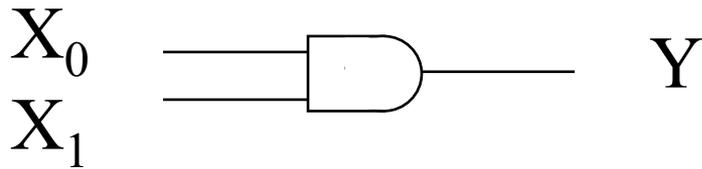


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0
ON	ON	4.5	4.5	4.5

真理値表

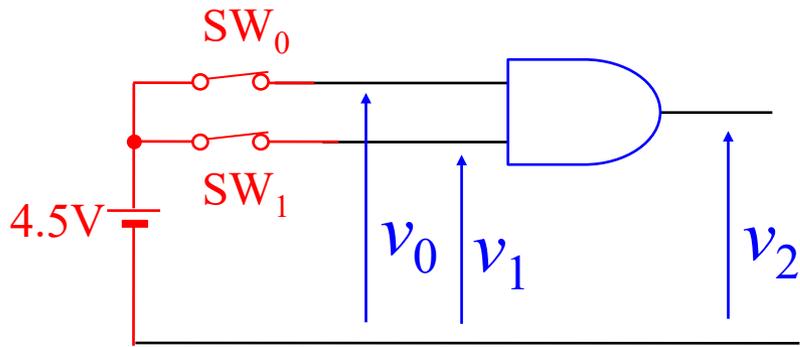
X_1	X_0	Y

記号表示



$Y =$

実際の回路

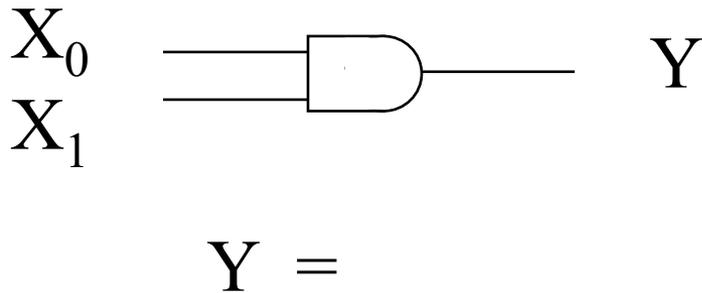


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0
ON	ON	4.5	4.5	4.5

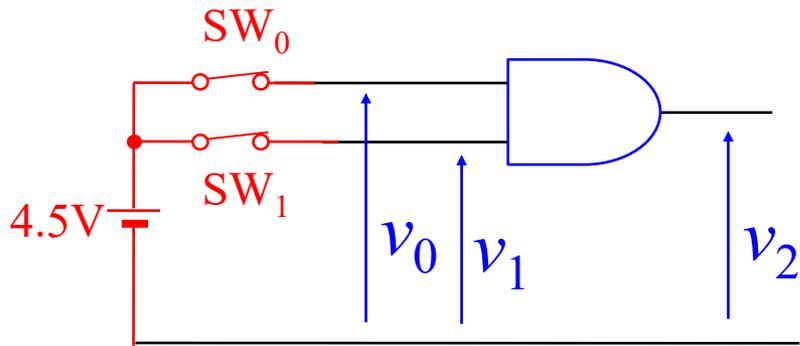
真理値表

X_1	X_0	Y
0	0	0
0	1	0
1	0	0
1	1	1

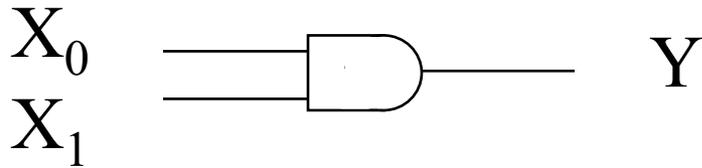
記号表示



実際の回路



記号表示



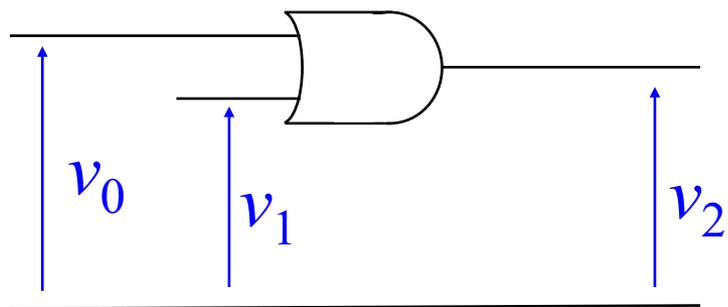
$$Y = X_1 X_0$$

SW ₀	SW ₁	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0
ON	ON	4.5	4.5	4.5

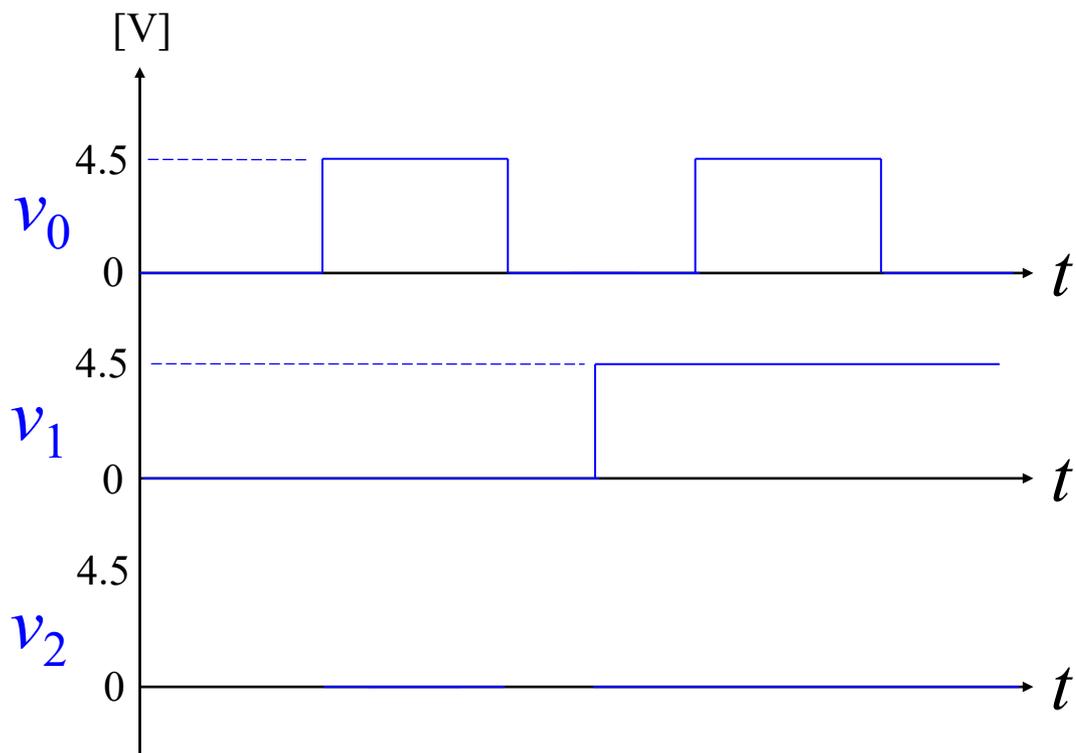
真理値表

X ₁	X ₀	Y
0	0	0
0	1	0
1	0	0
1	1	1

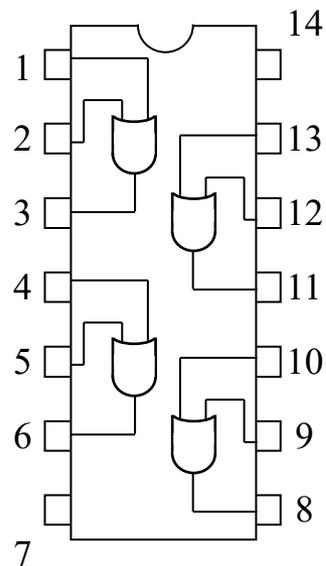
OR回路



4.5V 

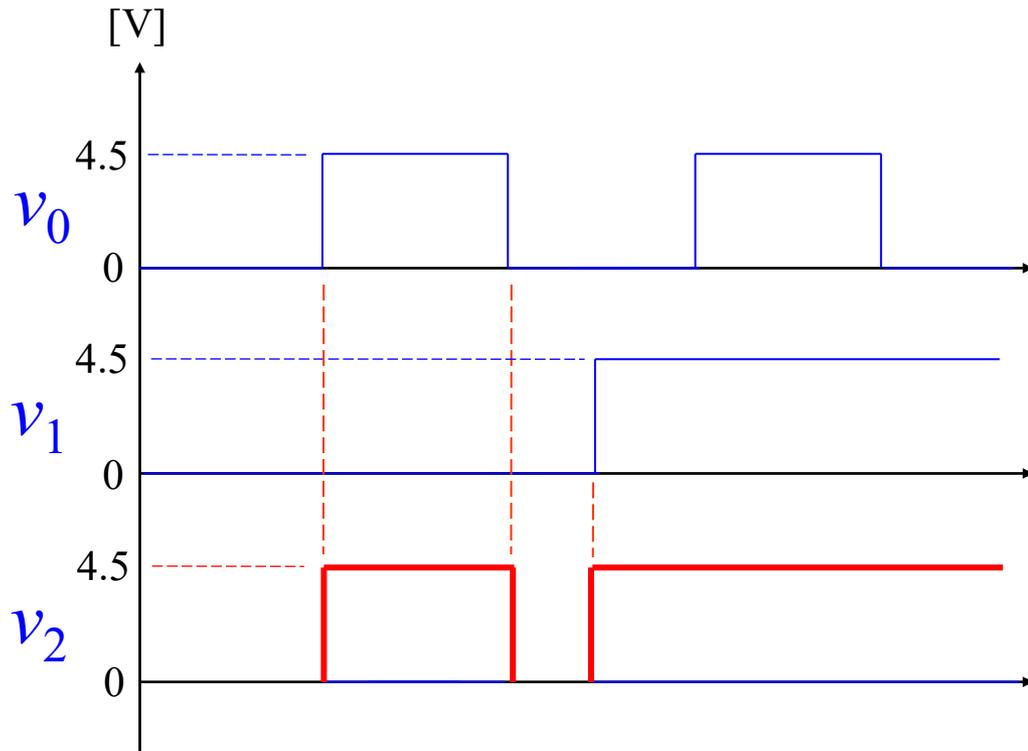
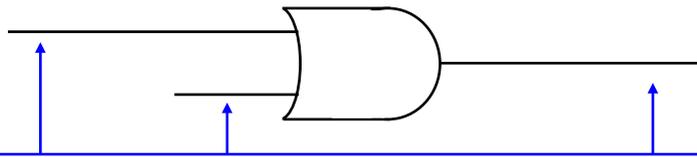


タイムチャート

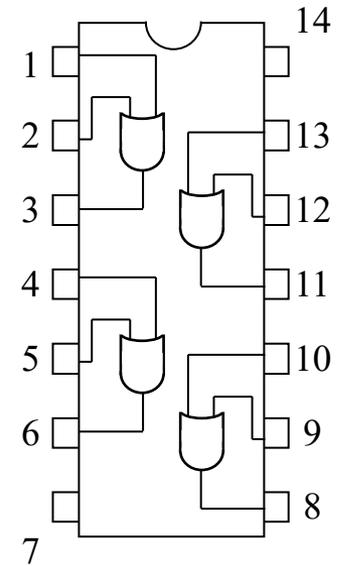


TC74HC32AP
OR回路

OR回路

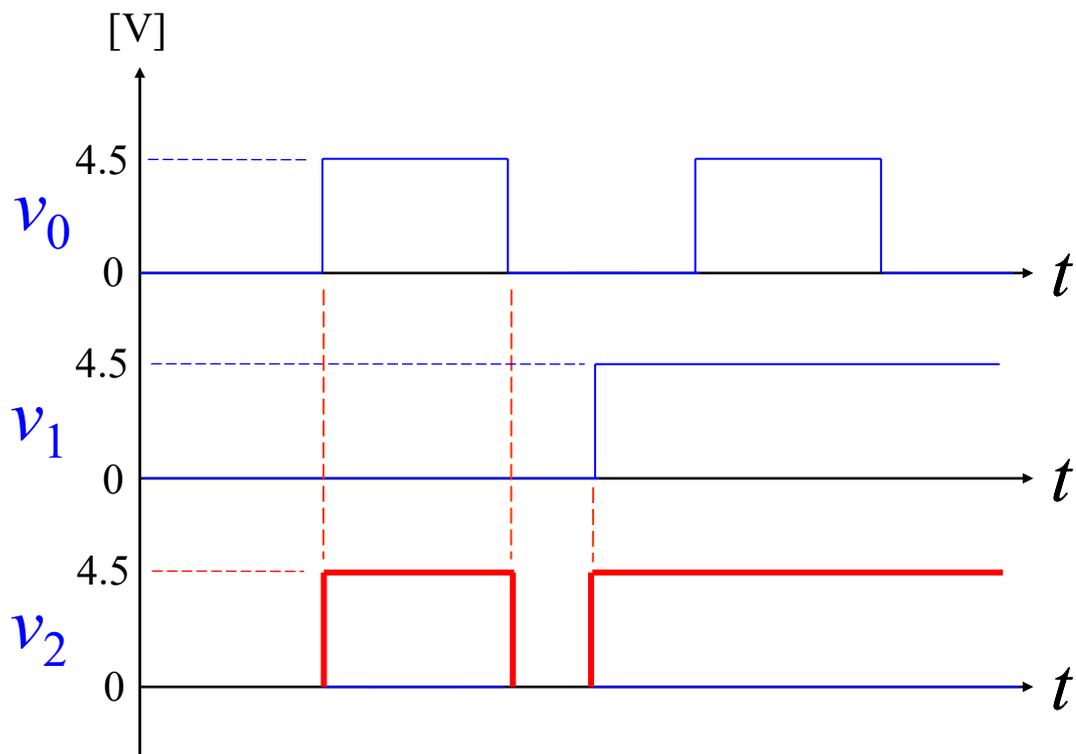
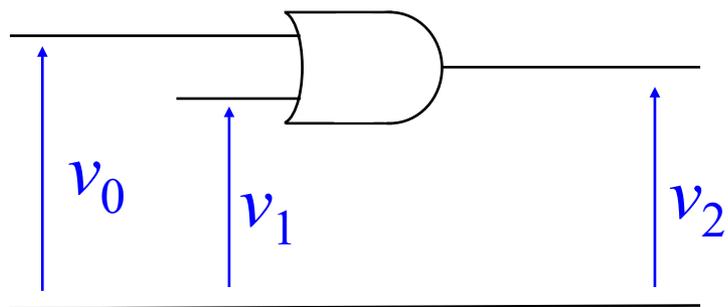


タイムチャート

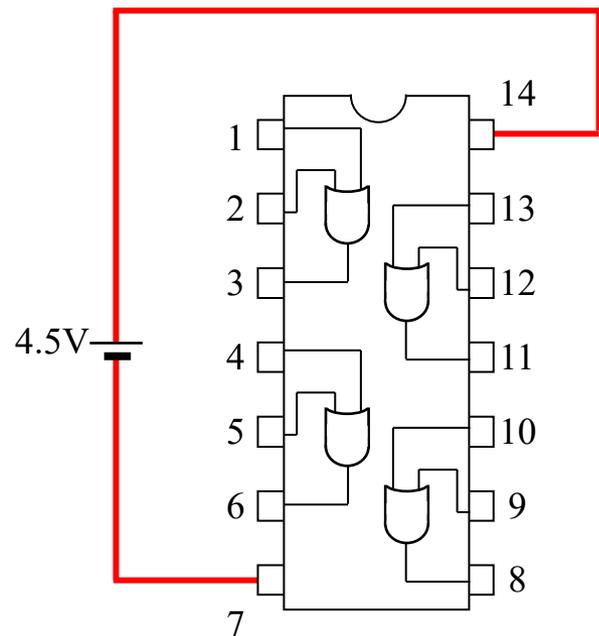


TC74HC32AP
OR回路

OR回路

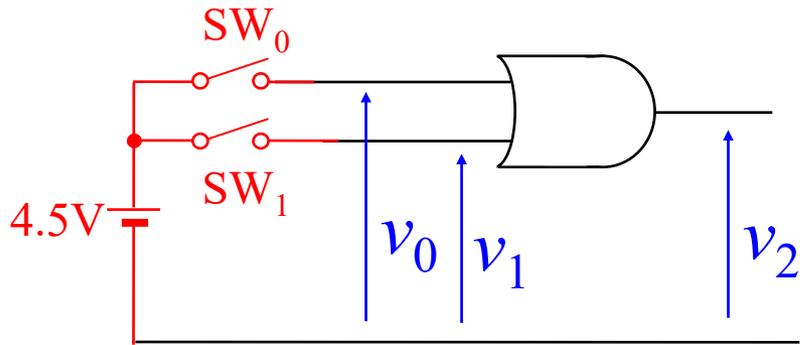


タイムチャート



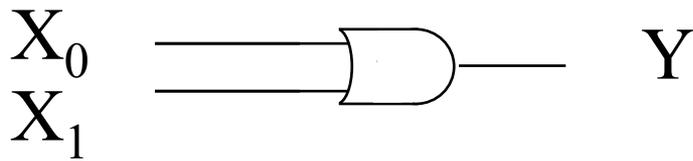
TC74HC32AP
OR回路

実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
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記号表示

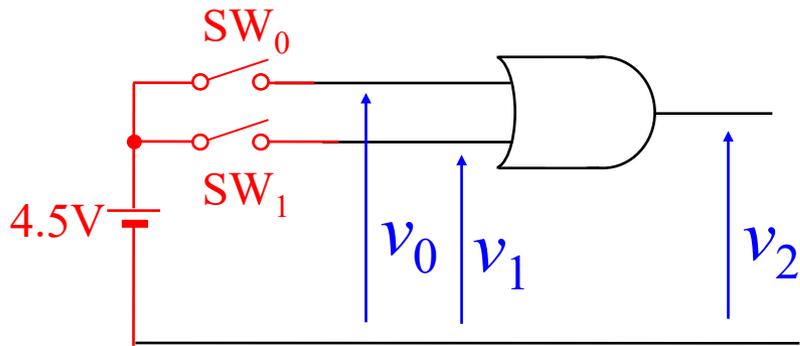


Y =

真理値表

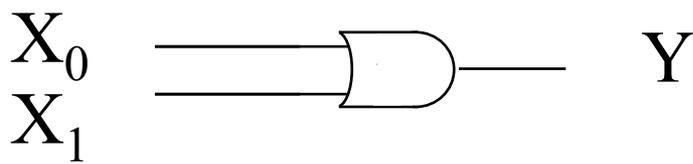
X ₁	X ₀	Y
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実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0

記号表示

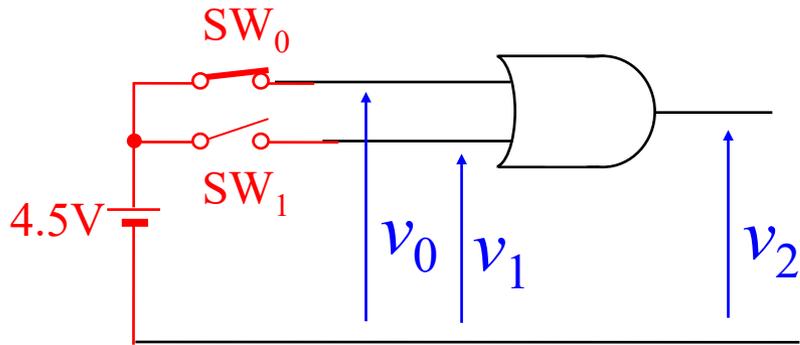


Y =

真理値表

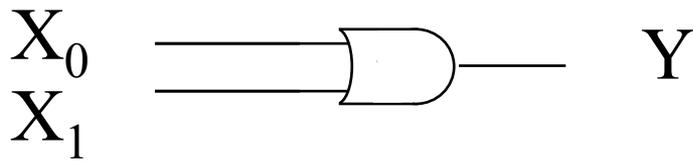
X ₁	X ₀	Y
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実際の回路



SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5

記号表示

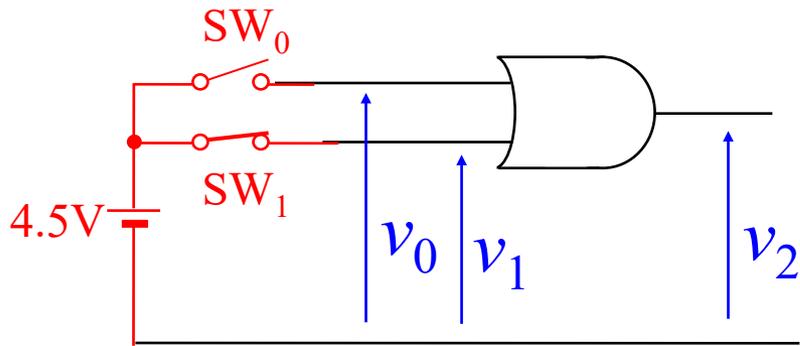


$$Y =$$

真理値表

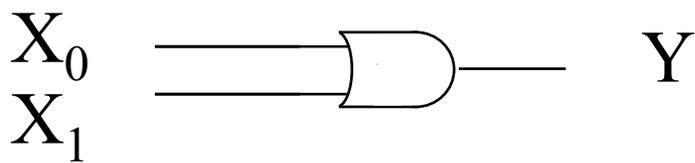
X ₁	X ₀	Y

実際の回路



SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5
ON	OFF	4.5	0	4.5

記号表示

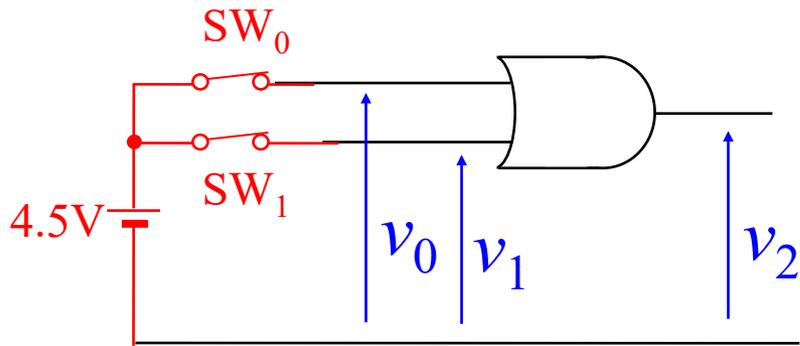


$$Y =$$

真理値表

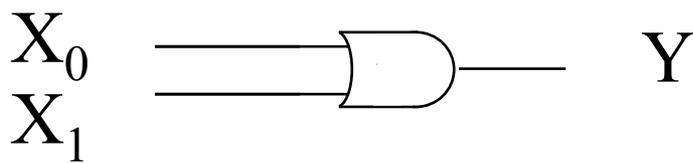
X_1	X_0	Y

実際の回路



SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5
ON	OFF	4.5	0	4.5
ON	ON	4.5	4.5	4.5

記号表示

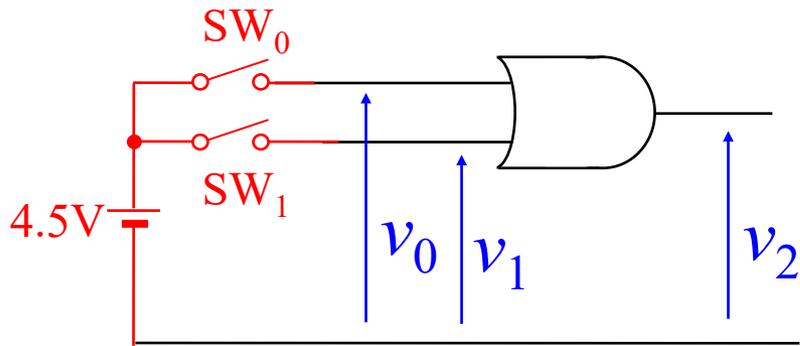


$Y =$

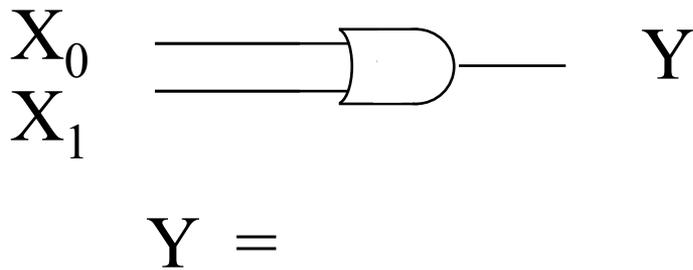
真理値表

X_1	X_0	Y

実際の回路



記号表示

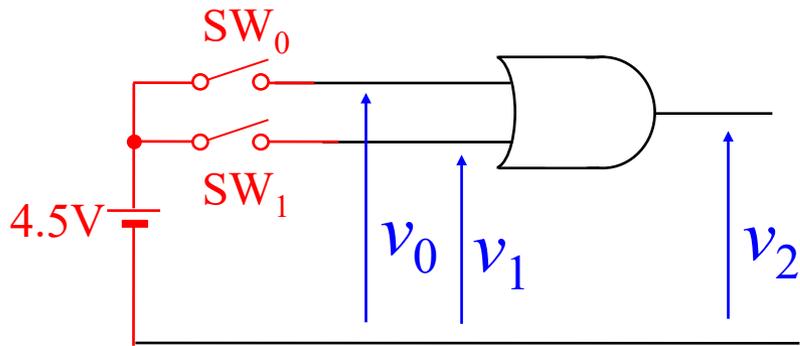


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5
ON	OFF	4.5	0	4.5
ON	ON	4.5	4.5	4.5

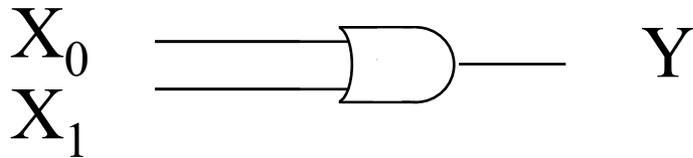
真理値表

X_1	X_0	Y
0	0	0
0	1	1
1	0	1
1	1	1

実際の回路



記号表示



$$Y = X_1 + X_0$$

SW ₁	SW ₀	v ₁ [V]	v ₀ [V]	v ₂ [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5
ON	OFF	4.5	0	4.5
ON	ON	4.5	4.5	4.5

真理値表

X ₁	X ₀	Y
0	0	0
0	1	1
1	0	1
1	1	1

組み合わせ論理回路

論理式

論理積 $Y =$

論理和 $Y =$

否定 $Y =$

定理

$$X_1 X_1 = X_1$$

$$X_1 + X_1 = X_1$$

$$X_1 X_0 = X_0 X_1$$

$$X_1 + X_0 = X_0 + X_1$$

$$X_2 (X_1 X_0) = (X_2 X_1) X_0$$

$$X_2 + (X_1 + X_0) = (X_2 + X_1) + X_0$$

$$X_0 + X_1 X_0 =$$

$$X_0 (X_1 + X_0) =$$

組み合わせ論理回路

論理式

論理積

$$Y = X_1 X_0$$

論理和

$$Y = X_1 + X_0$$

否定

$$Y = \overline{X_0}$$

定理

$$X_1 X_1 = X_1$$

$$X_1 + X_1 = X_1$$

$$X_1 X_0 = X_0 X_1$$

$$X_1 + X_0 = X_0 + X_1$$

$$X_2 (X_1 X_0) = (X_2 X_1) X_0$$

$$X_2 + (X_1 + X_0) = (X_2 + X_1) + X_0$$

$$X_0 + X_1 X_0 =$$

$$X_0 (X_1 + X_0) =$$

組み合わせ論理回路

論理式

論理積

$$Y = X_1 X_0$$

論理和

$$Y = X_1 + X_0$$

否定

$$Y = \overline{X_0}$$

定理

$$X_1 X_1 = X_1$$

$$X_1 + X_1 = X_1$$

$$X_1 X_0 = X_0 X_1$$

$$X_1 + X_0 = X_0 + X_1$$

$$X_2 (X_1 X_0) = (X_2 X_1) X_0$$

$$X_2 + (X_1 + X_0) = (X_2 + X_1) + X_0$$

$$X_0 + X_1 X_0 = X_0$$

$$X_0 (X_1 + X_0) = X_0$$

定理 $X_2(X_1 + X_0) =$

$$X_2 + X_1 X_0 =$$

$$X_0 \bar{X}_0 = 0$$

$$X_0 + \bar{X}_0 = 1$$

$$X_1 1 = X_1$$

$$X_0 + 0 = X_0$$

$$X_0 0 = 0$$

$$X_0 + 1 = 1$$

$$\bar{\bar{X}}_0 =$$

ド・モルガン

$$\overline{X_1 X_0} =$$

$$\overline{X_1 + X_0} =$$

定理

$$X_2(X_1 + X_0) = X_2X_1 + X_2X_0$$

$$X_2 + X_1X_0 = (X_2 + X_1)(X_2 + X_0)$$

$$X_0\bar{X}_0 = 0$$

$$X_0 + \bar{X}_0 = 1$$

$$X_11 = X_1$$

$$X_0 + 0 = X_0$$

$$X_00 = 0$$

$$X_0 + 1 = 1$$

$$\bar{\bar{X}}_0 = X_0$$

ド・モルガン

$$\overline{X_1X_0} =$$

$$\overline{X_1 + X_0} =$$

定理

$$X_2(X_1 + X_0) = X_2X_1 + X_2X_0$$

$$X_2 + X_1X_0 = (X_2 + X_1)(X_2 + X_0)$$

$$X_0\bar{X}_0 = 0$$

$$X_0 + \bar{X}_0 = 1$$

$$X_11 = X_1$$

$$X_0 + 0 = X_0$$

$$X_00 = 0$$

$$X_0 + 1 = 1$$

$$\bar{\bar{X}}_0 = X_0$$

ド・モルガン

$$\overline{X_1X_0} =$$

$$\overline{X_1 + X_0} =$$

定理

$$X_2(X_1 + X_0) = X_2X_1 + X_2X_0$$

$$X_2 + X_1X_0 = (X_2 + X_1)(X_2 + X_0)$$

$$X_0\bar{X}_0 = 0$$

$$X_0 + \bar{X}_0 = 1$$

$$X_1 1 = X_1$$

$$X_0 + 0 = X_0$$

$$X_0 0 = 0$$

$$X_0 + 1 = 1$$

$$\bar{\bar{X}}_0 = X_0$$

ド・モルガン

$$\overline{X_1 X_0} = \bar{X}_1 + \bar{X}_0$$

$$\overline{X_1 + X_0} = \bar{X}_1 \bar{X}_0$$

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0		
0	1		
1	0		
1	1		

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0		
0	1		
1	0		
1	1		

$\overline{X_1} \cdot \overline{X_0} = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0					
0	1					
1	0					
1	1					

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	0
1	0	0	0
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	0
1	0	1	0
1	1	1	1

X_1	X_0	$X_1 X_0$	$X_1 X_0$	\bar{X}_1	\bar{X}_0	$\bar{X}_1 + \bar{X}_0$
0	0			1	1	1
0	1			1	0	1
1	0			0	1	1
1	1			0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	0
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0		
0	1		
1	0		
1	1		

X_1	X_0	$X_1 X_0$	$X_1 X_0$	\bar{X}_1	\bar{X}_0	$\bar{X}_1 + \bar{X}_0$
0	0					
0	1					
1	0					
1	1					

論理式

$$X_0 + X_1 X_0 = X_0$$

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	0
1	1	1	1

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0		
0	1		
1	0		
1	1		

X_1	X_0	$X_1 X_0$	$X_1 X_0$	\bar{X}_1	\bar{X}_0	$\bar{X}_1 + \bar{X}_0$
0	0					
0	1					
1	0					
1	1					

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot \overline{X_0} = \overline{X_1 + X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 \wedge X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1 + X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	0
1	0	0	1	0	1	0
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot \overline{X_0} = \overline{X_1 + X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 + X_0}$
0	0	0	1
0	1	0	0
1	0	0	0
1	1	1	0

論理式

$$X_0(X_1+X_0)=X_0$$

$X_0 + X_1X_0 = X_0$ の証明

X_1	X_0	X_1X_0	$X_0+X_1X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

X_1	X_0	X_1+X_0	$X_0(X_1+X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot \overline{X_0} = \overline{X_1 + X_0}$ の証明

X_1	X_0	X_1X_0	$\overline{X_1+X_0}$
0	0	0	1
0	1	0	0
1	0	0	0
1	1	1	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot \overline{X_0} = \overline{X_1 + X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1 + X_0}$
0	0					
0	1					
1	0					
1	1					

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot X_0 = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1 X_0} = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot X_0 = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot X_0 = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	0
1	0	0	1	0	1	1
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot X_0 = \overline{X_1} + \overline{X_0}$ の証明

X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0

論理式

$X_0 + X_1 X_0 = X_0$ の証明

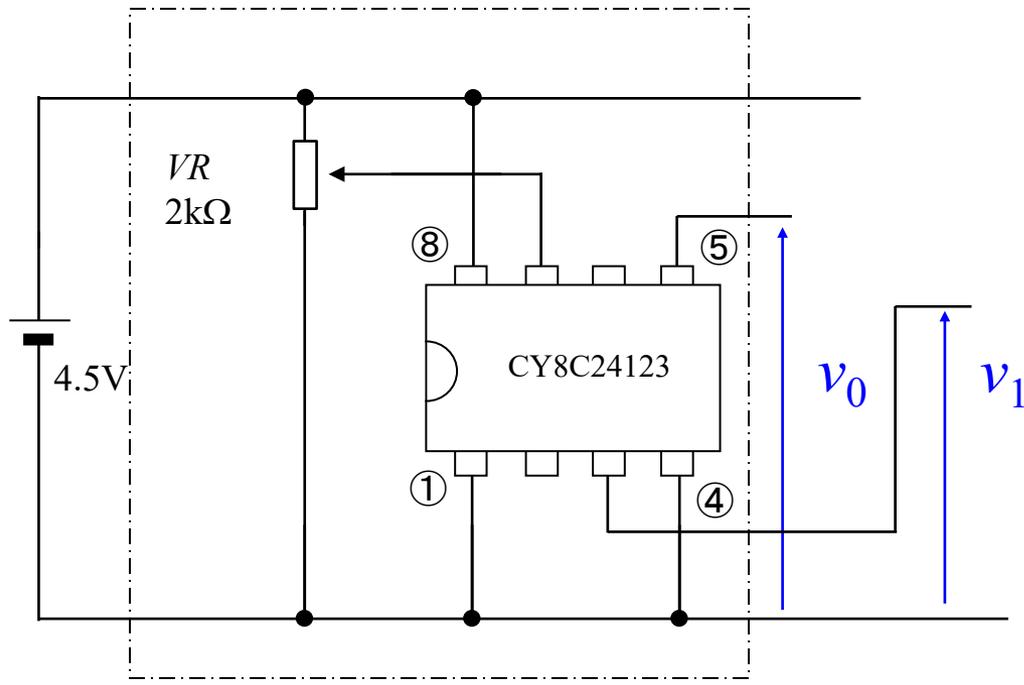
X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ の証明

X_1	X_0	$X_1 + X_0$	$X_0(X_1 + X_0)$
0	0	0	0
0	1	1	1
1	0	1	0
1	1	1	1

$\overline{X_1} \cdot X_0 = \overline{X_1} + \overline{X_0}$ の証明

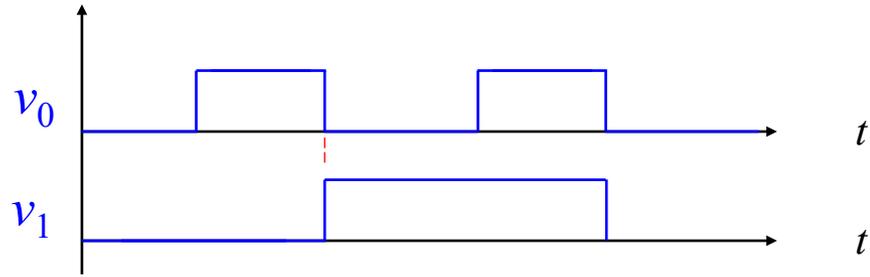
X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0



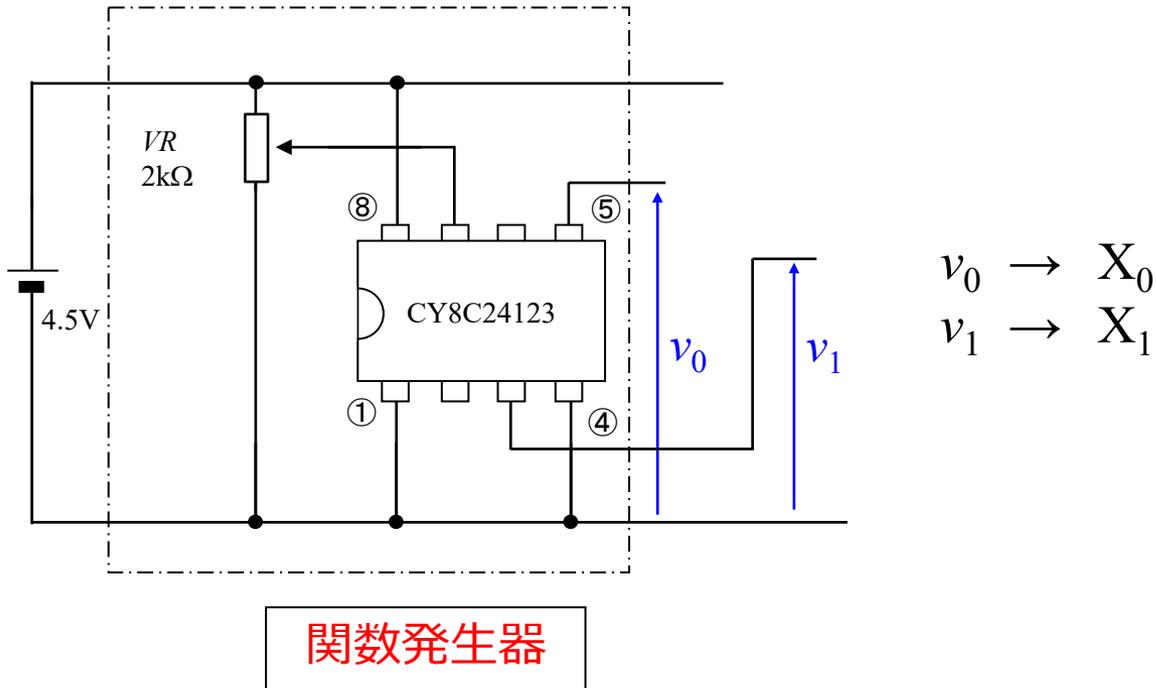
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

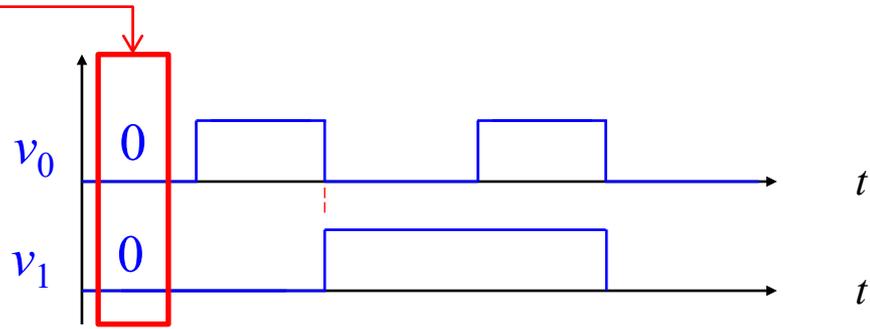
X_1	X_0
0	0
0	1
1	0
1	1



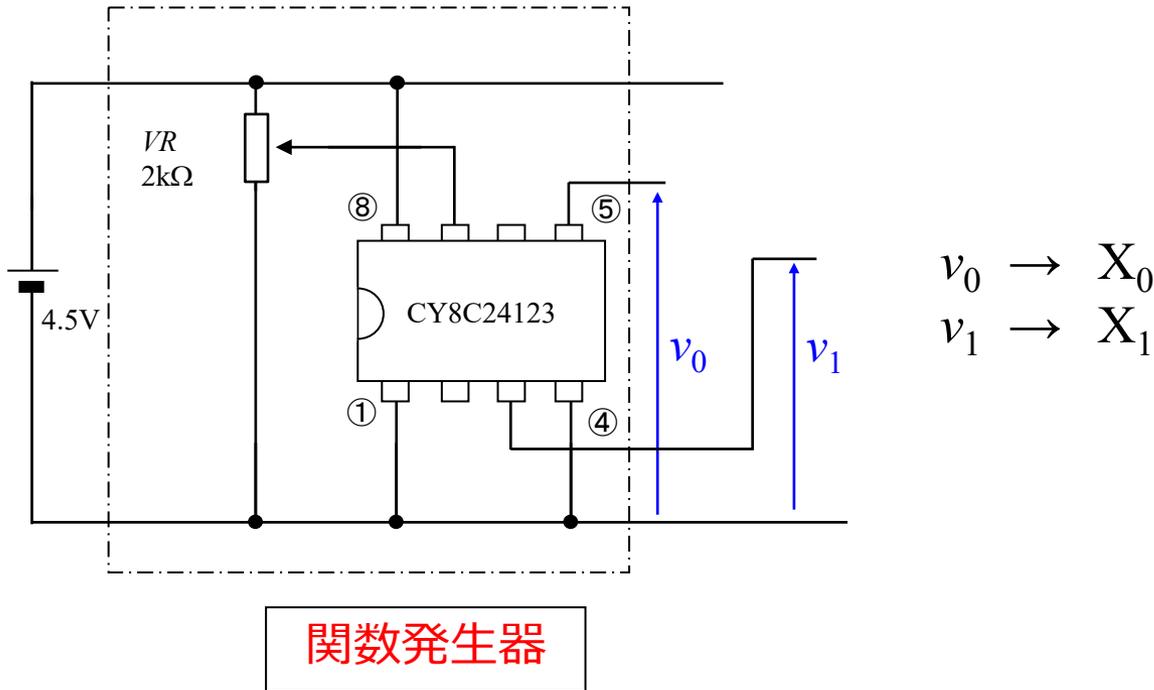
タイムチャート



X_1	X_0
0	0
0	1
1	0
1	1

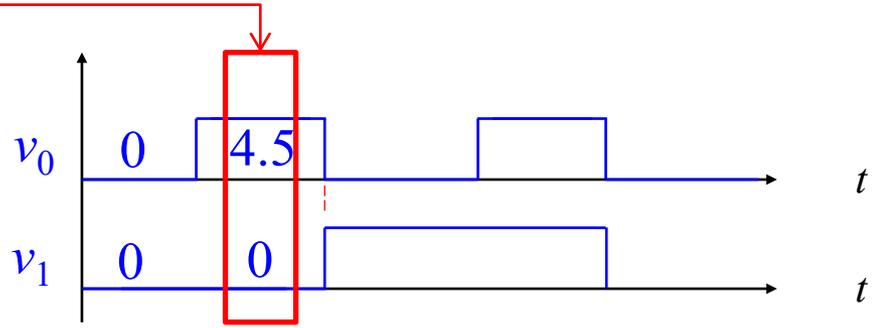


タイムチャート

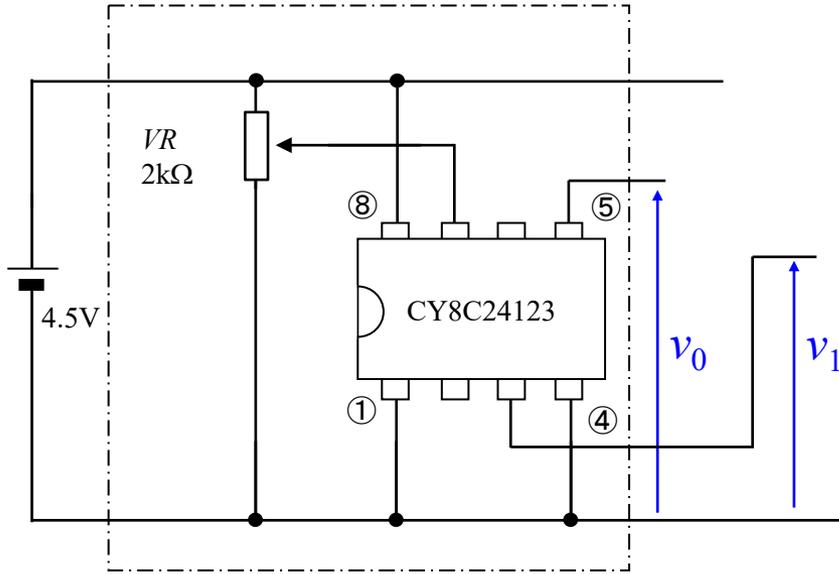


関数発生器

X_1	X_0
0	0
0	1
1	0
1	1



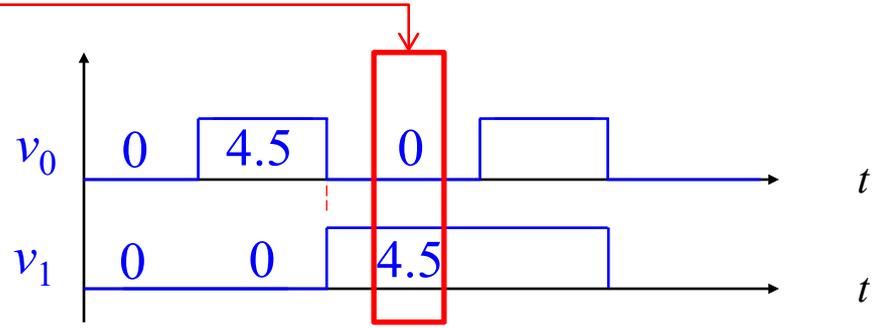
タイムチャート



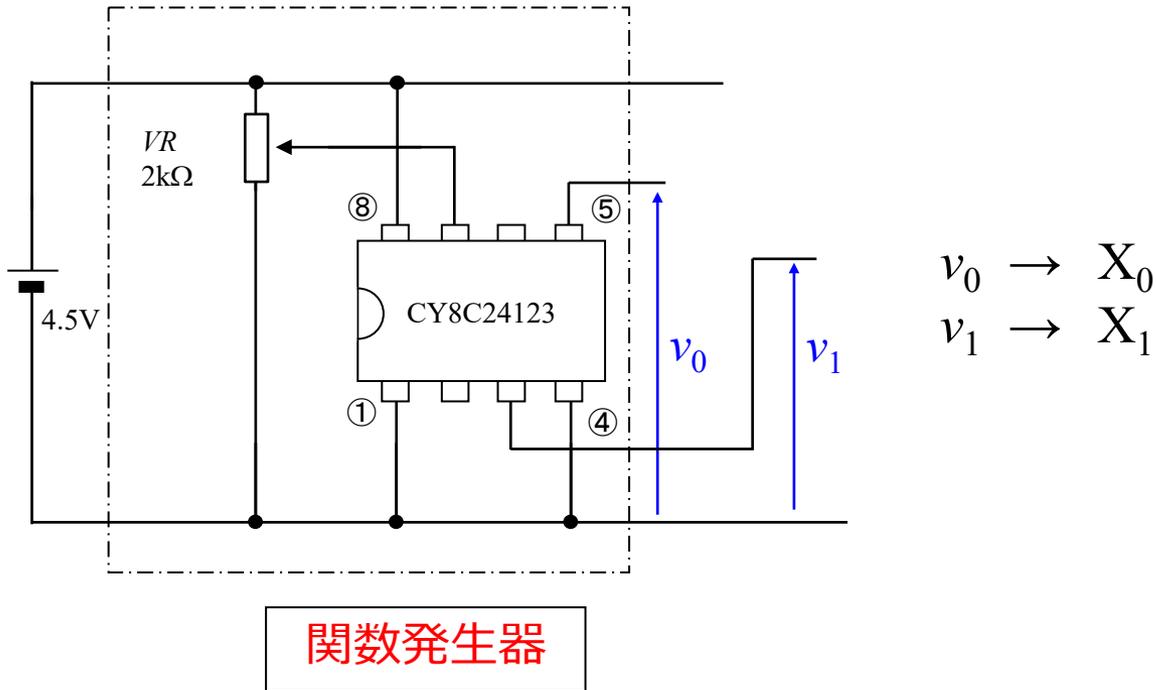
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

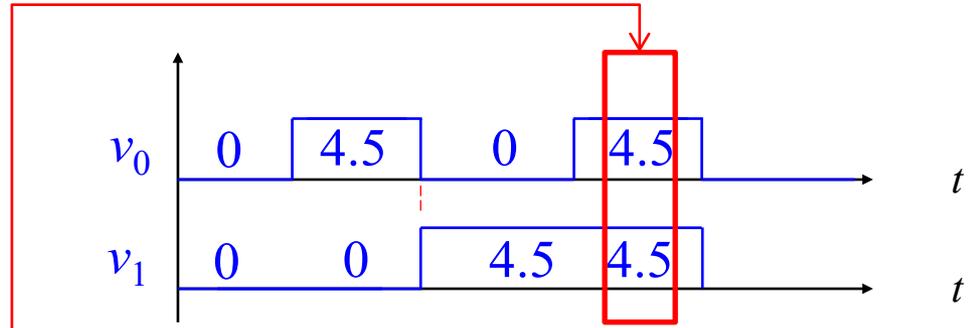
X_1	X_0
0	0
0	1
1	0
1	1



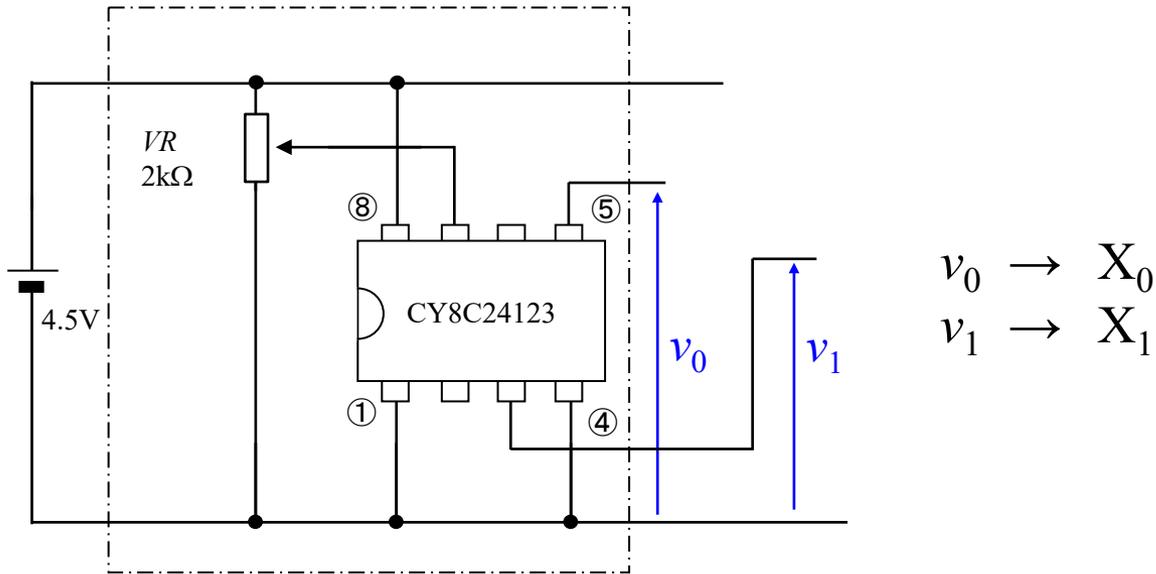
タイムチャート



X_1	X_0
0	0
0	1
1	0
1	1



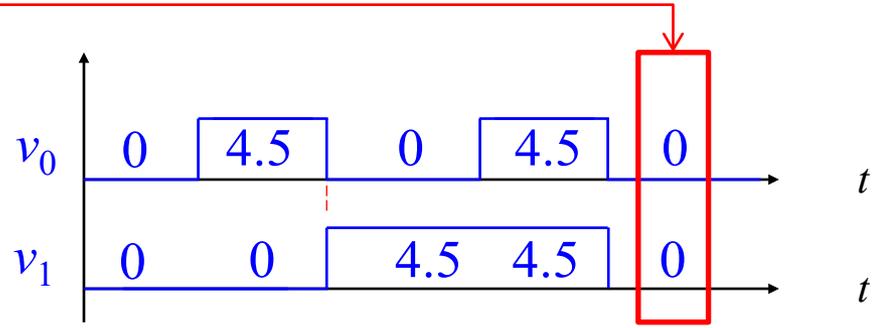
タイムチャート



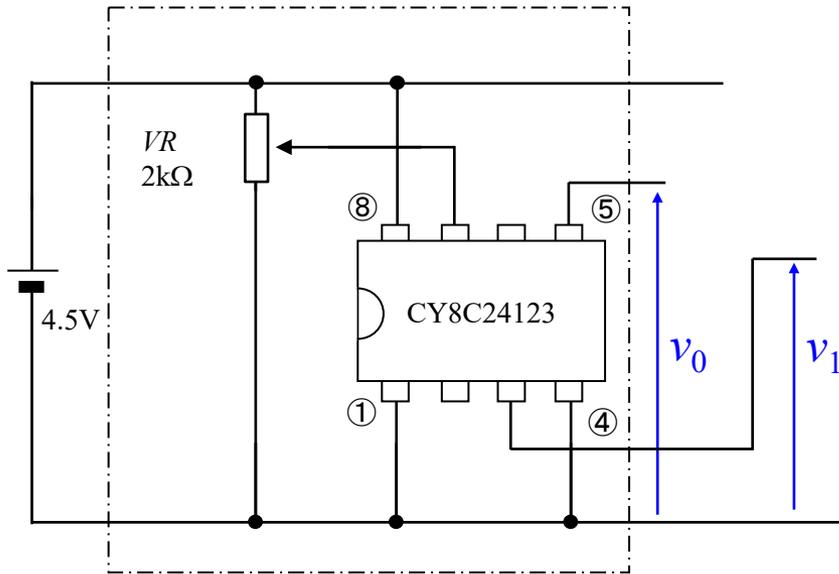
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

X_1	X_0
0	0
0	1
1	0
1	1



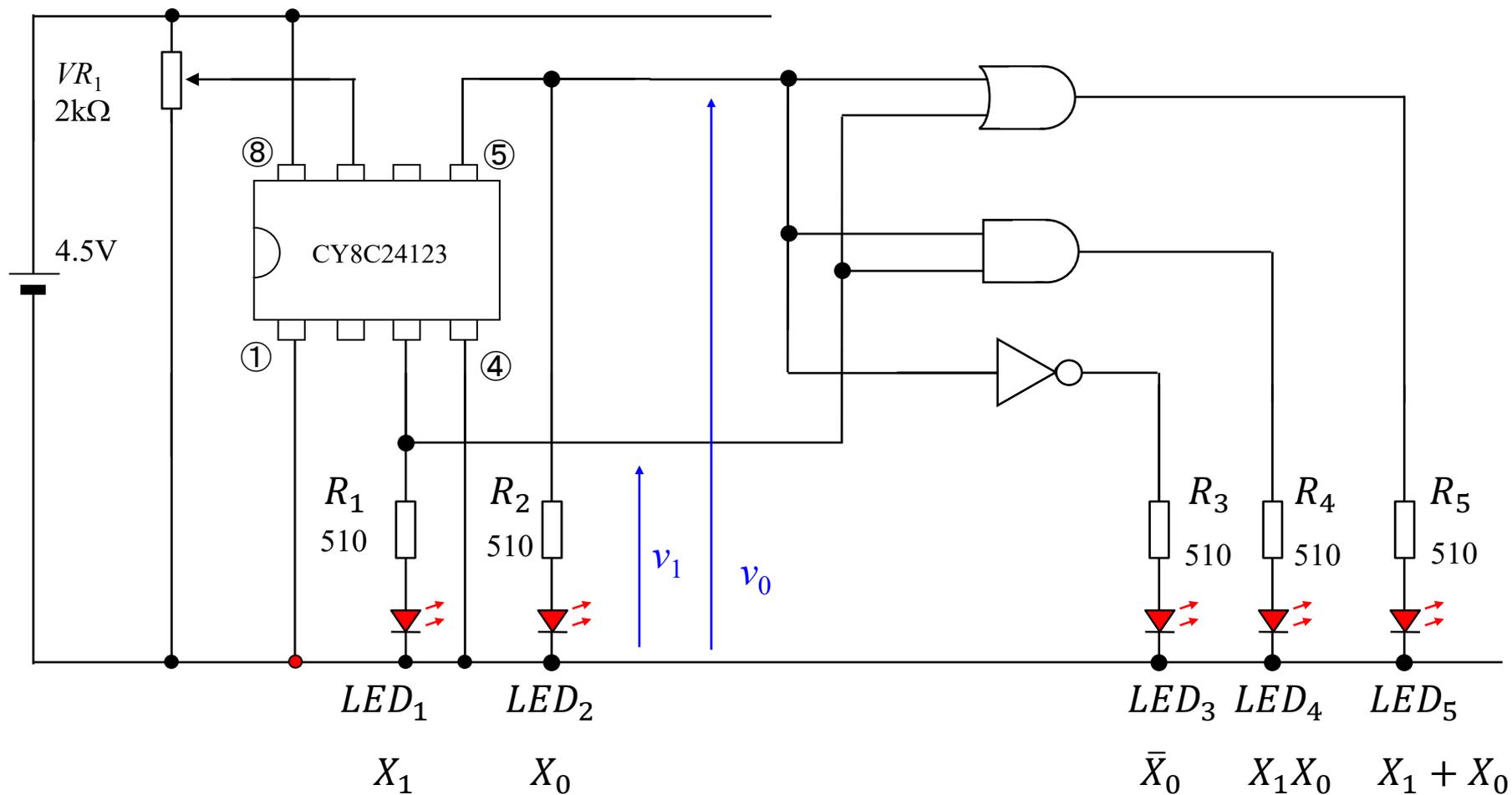
タイムチャート



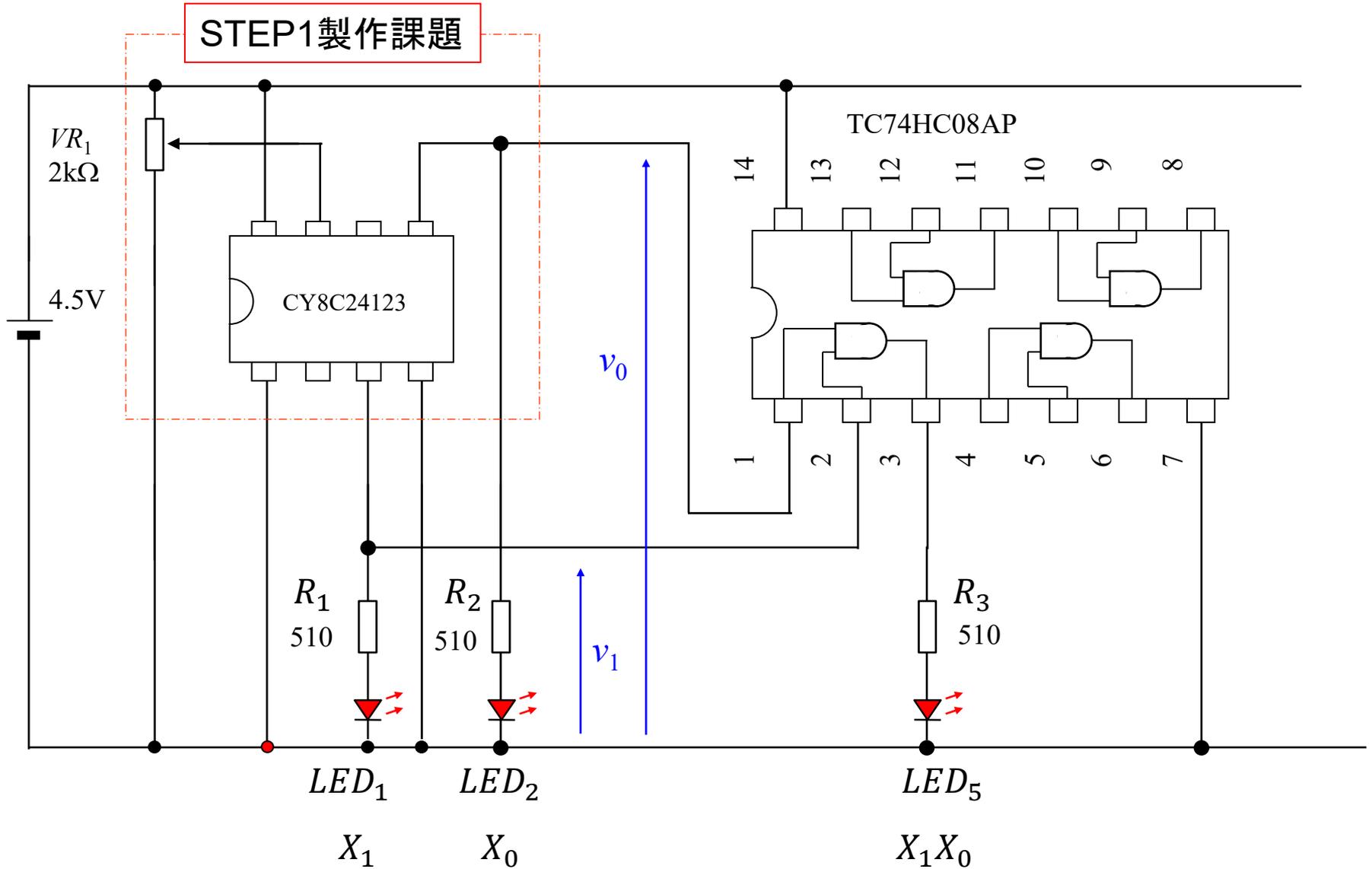
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

STEP2 製作課題 以下の回路を製作し, AND, OR, NOT回路の働きを確認せよ.

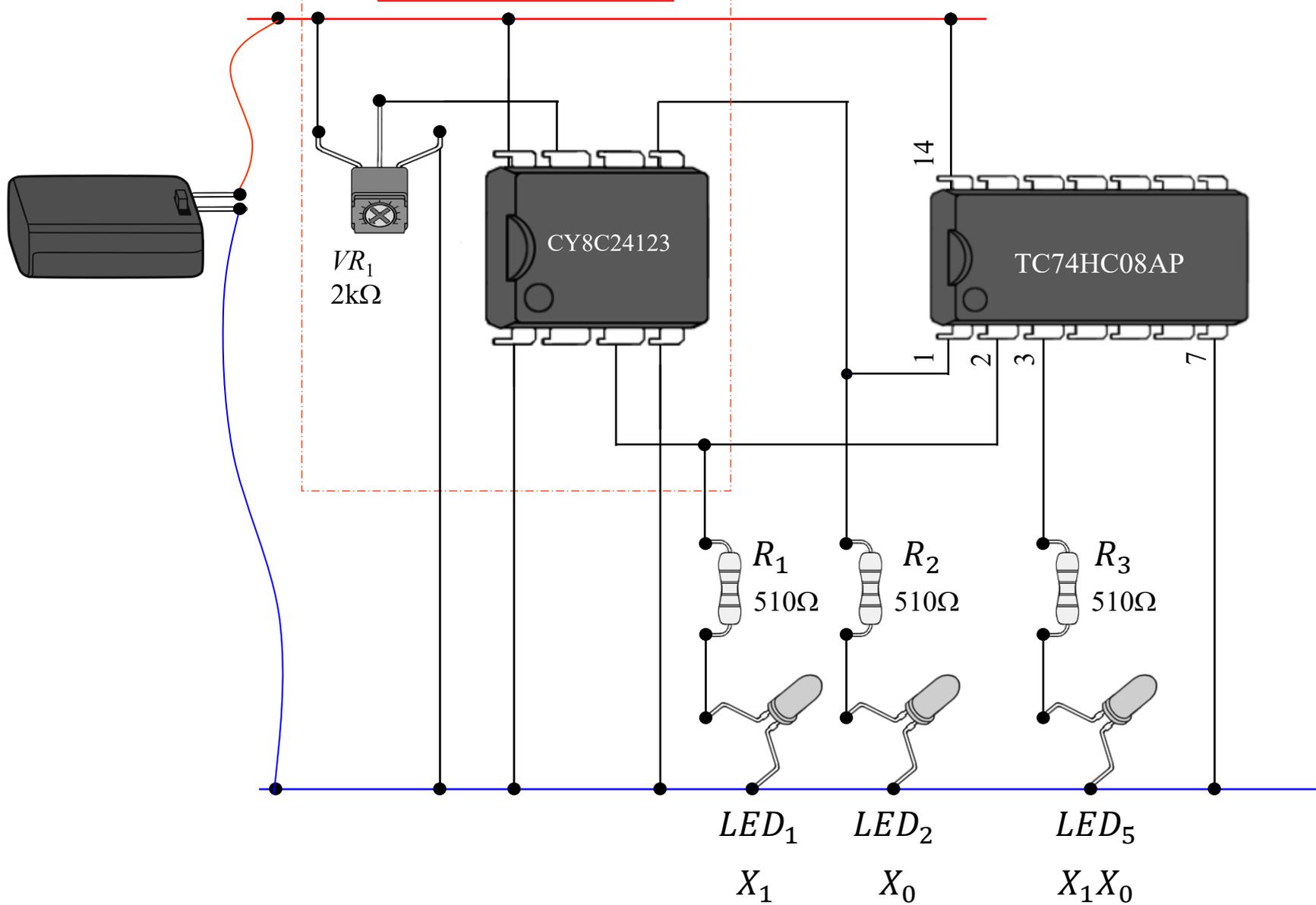


STEP2 製作課題 (解答の一部) AND回路部分のみを示す.

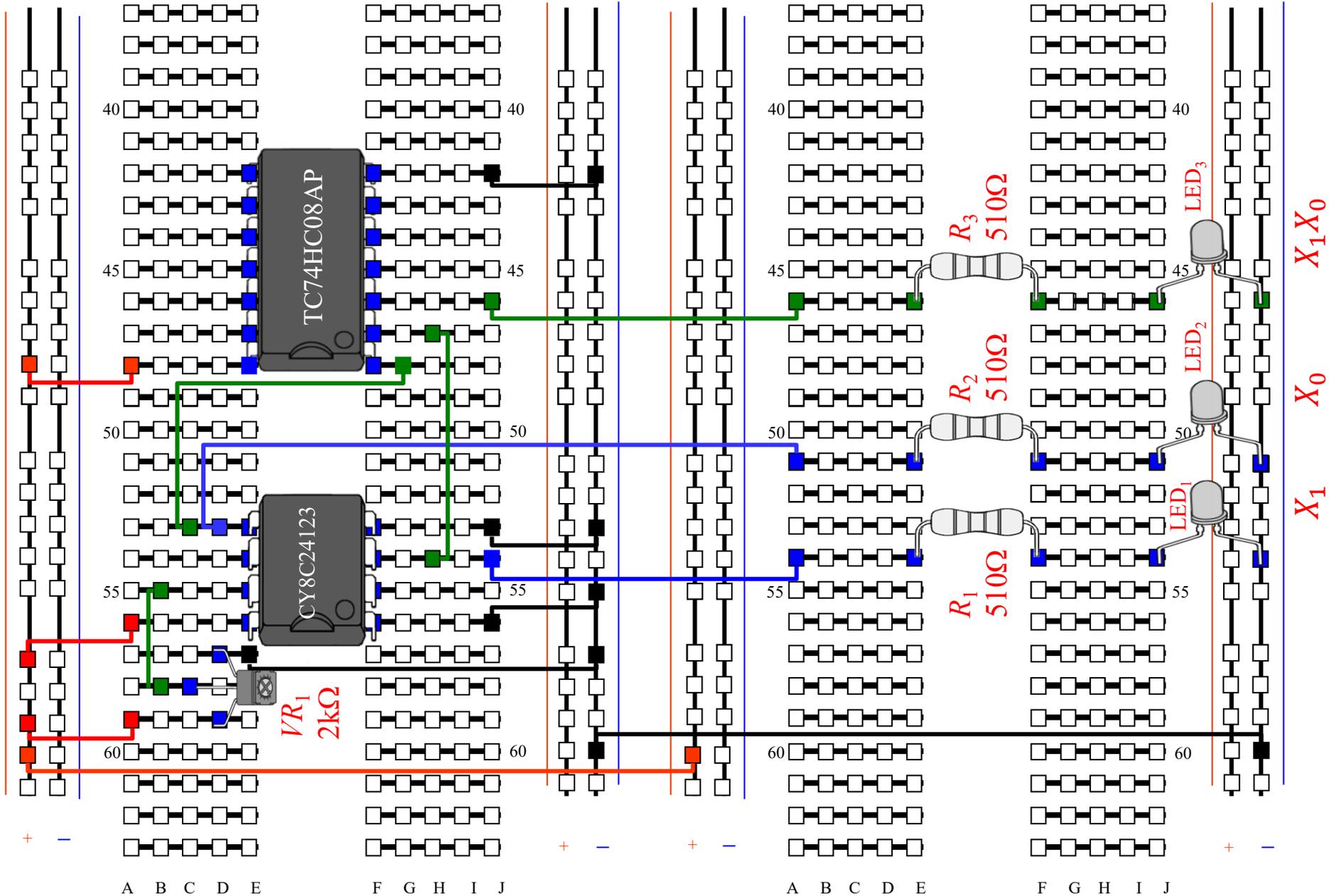


STEP2 製作課題 (解答の一部) AND回路部分のみを示す

STEP1製作課題



STEP2 製作課題 (解答の一部) AND回路部分のみを示す.

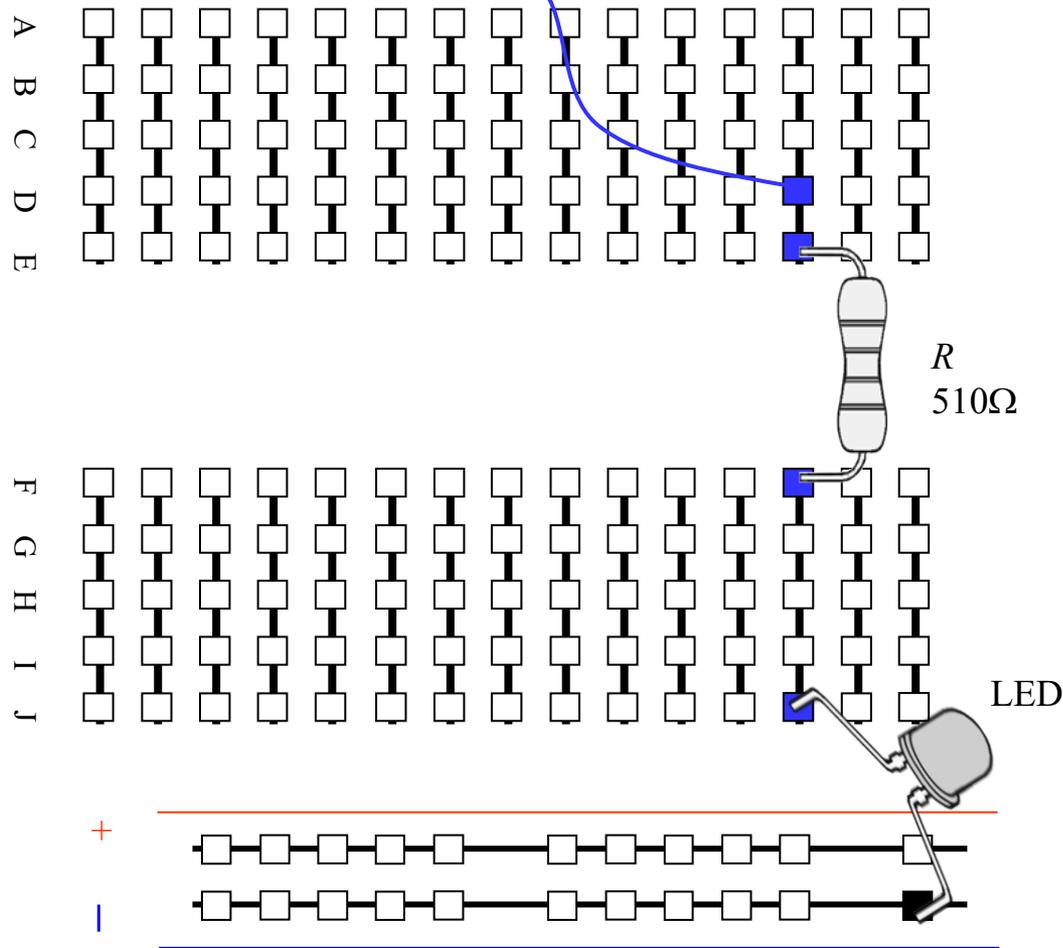
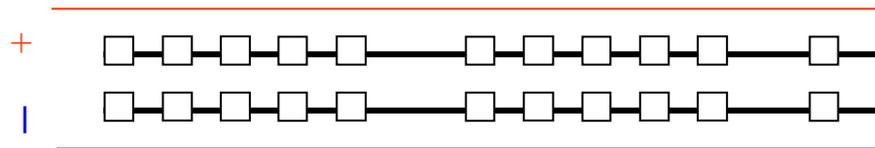
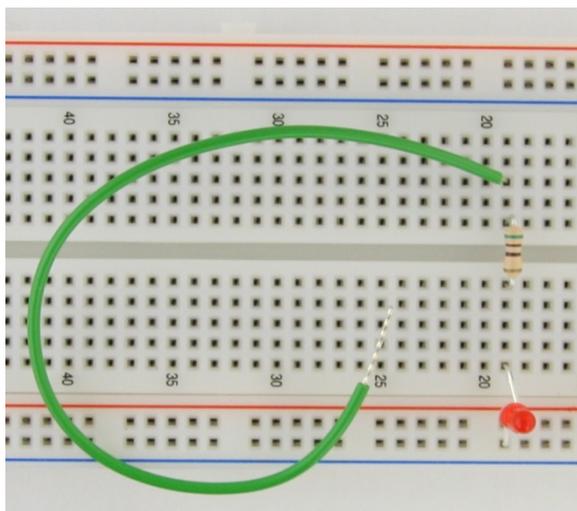
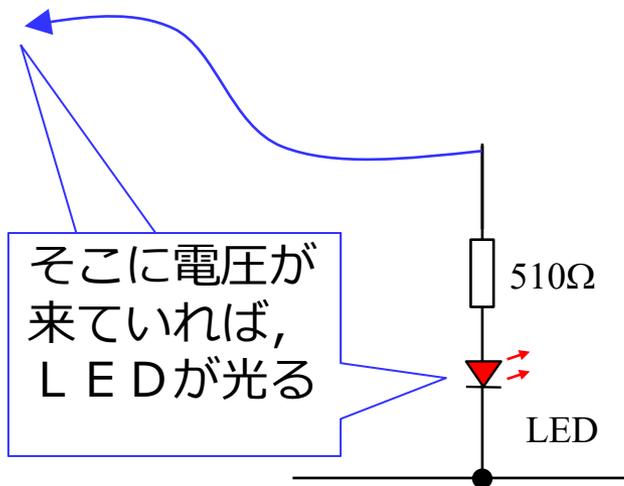


ビデオ

http://mybook-pub-site.sakura.ne.jp/digital_circuit/Exercise1/Exercise1.mp4

重要情報 うまく動作しないときの回路のチェック方法

チェック
箇所
の穴
に挿入



STEP2 レポート課題 真理値表を用いて以下の式が正しいことを示せ.

(1) 分配則

$$X_2(X_1 + X_0) = X_2X_1 + X_2X_0$$
$$X_2 + X_1 \cdot X_0 = (X_2 + X_1)(X_2 + X_0)$$

(2) ド・モルガン則

$$\overline{X_1 + X_0} = \bar{X}_1 \bar{X}_0$$

(3)

$$\bar{X}_1\bar{X}_0 + X_1\bar{X}_0 + X_1X_0 = \bar{X}_0 + X_1$$

(4)

$$\bar{X}_2X_1X_0 + X_2X_1\bar{X}_0 + X_2X_1X_0 = X_1X_0 + X_2X_1$$