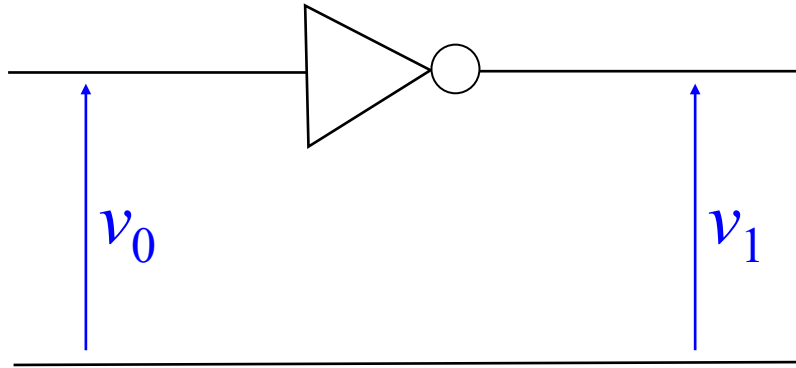


デジタル回路講義資料

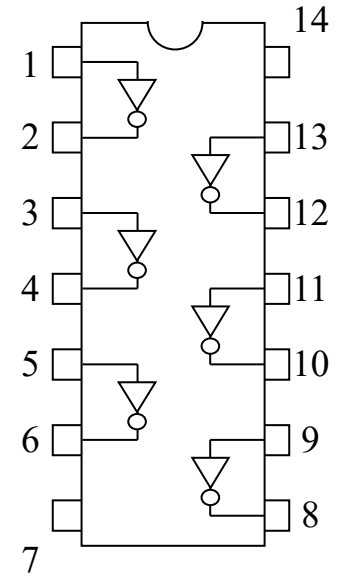
第2回 AND, OR, NOT回路

担当：古橋武

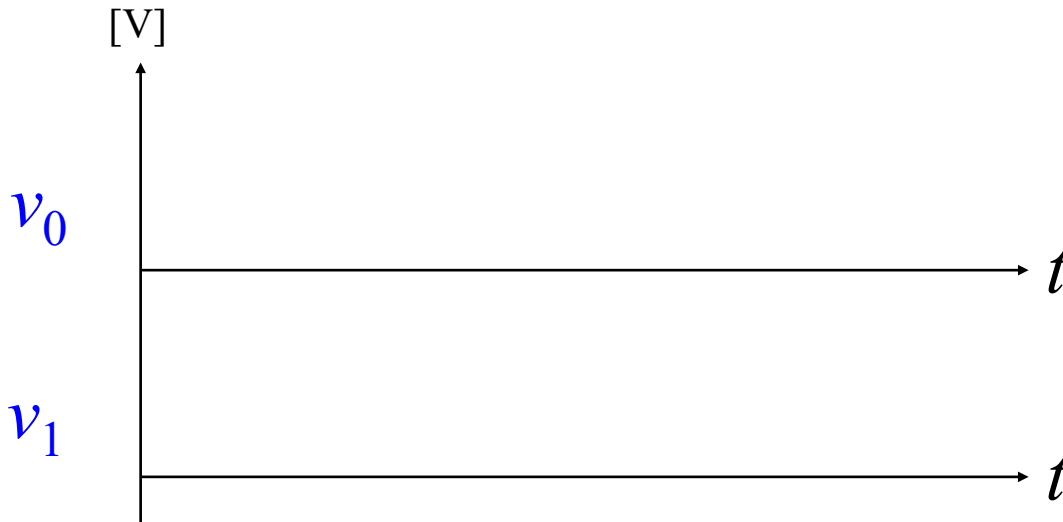
論理素子 NOT回路



4.5V =

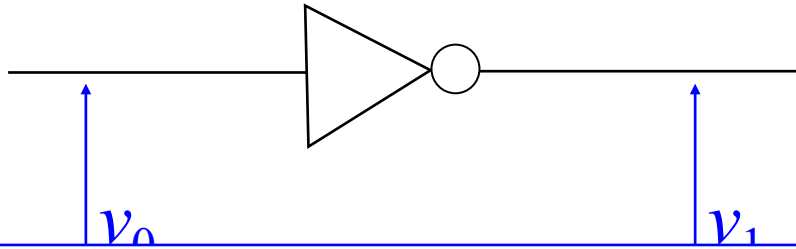


74HC04AP
NOT回路

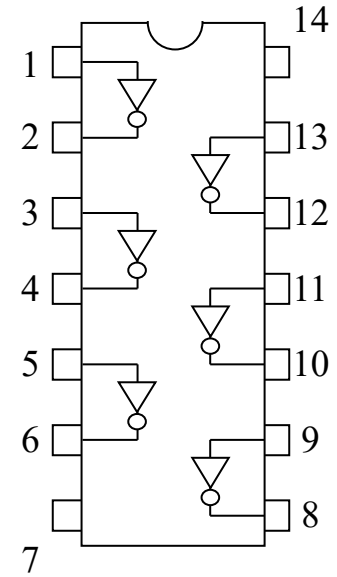
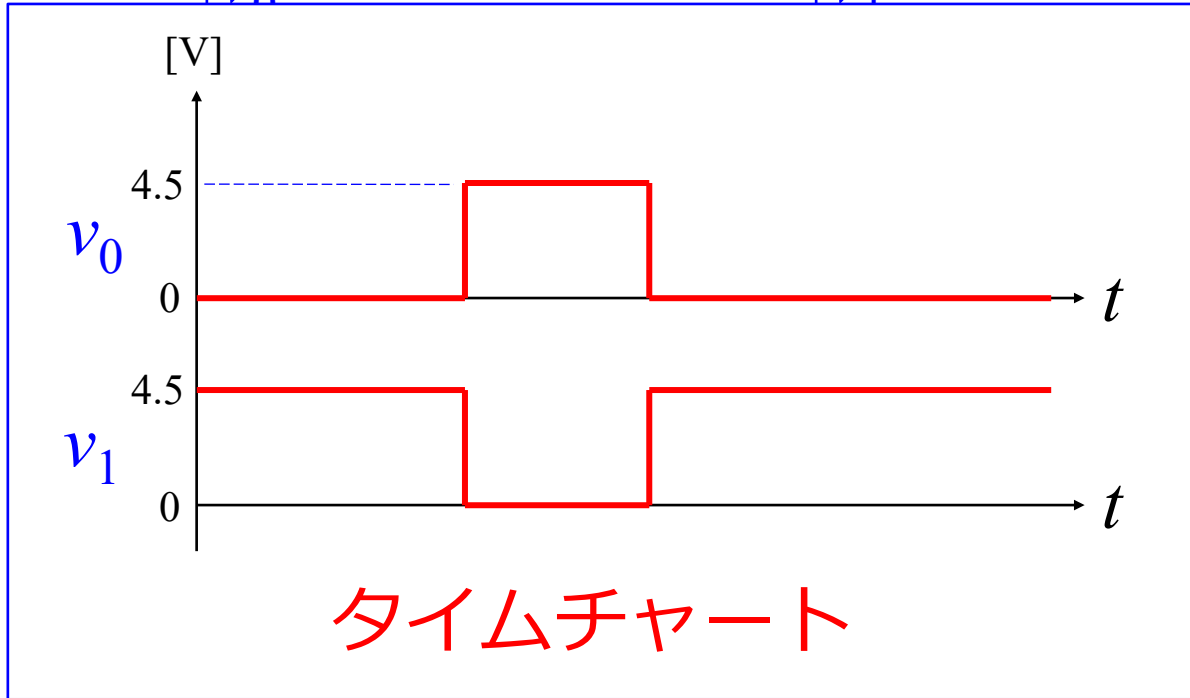


タイムチャート

論理素子 NOT回路

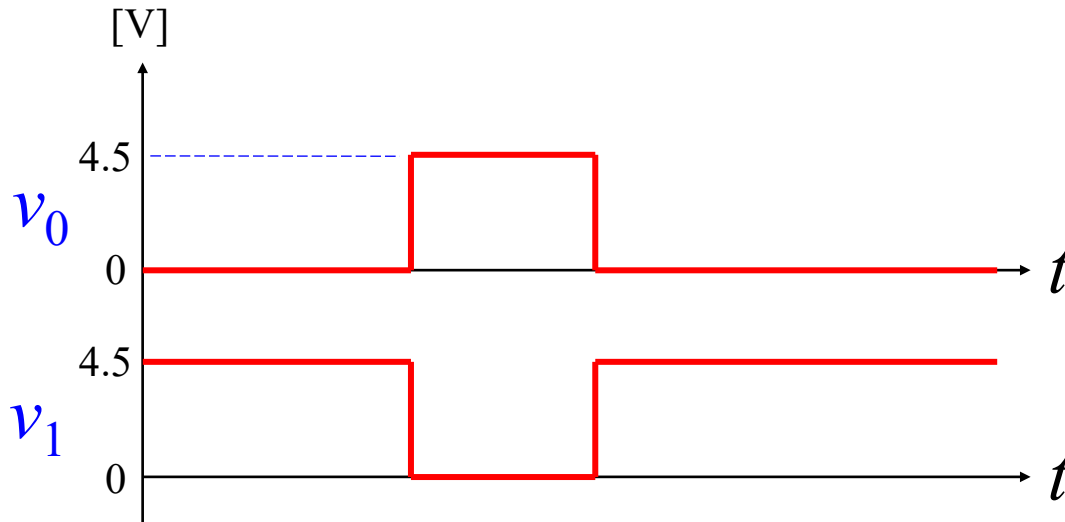
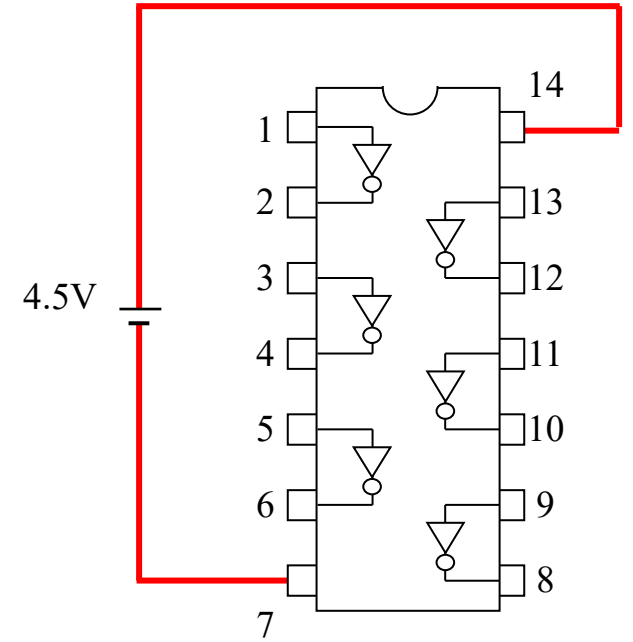
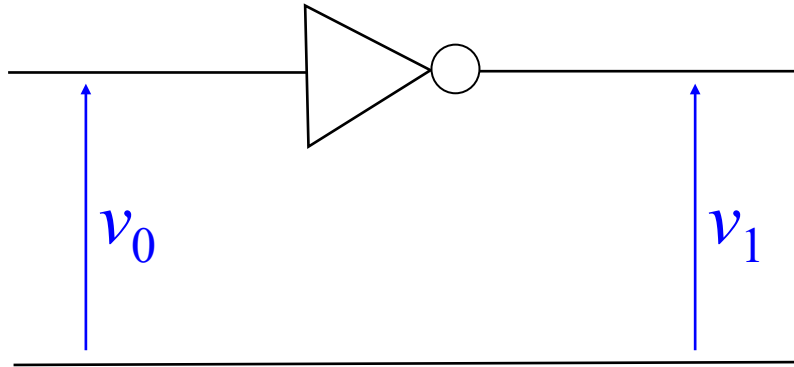


4.5V =



74HC04AP
NOT回路

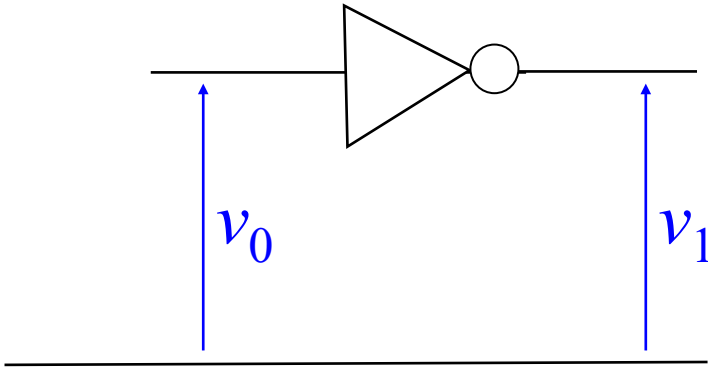
論理素子 NOT回路



74HC04AP
NOT回路

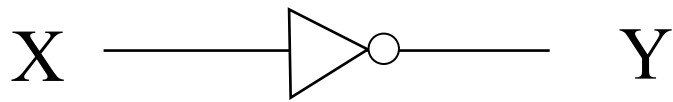
タイムチャート

実際の回路



SW	v_0 [V]	v_1 [V]
OFF		
ON		

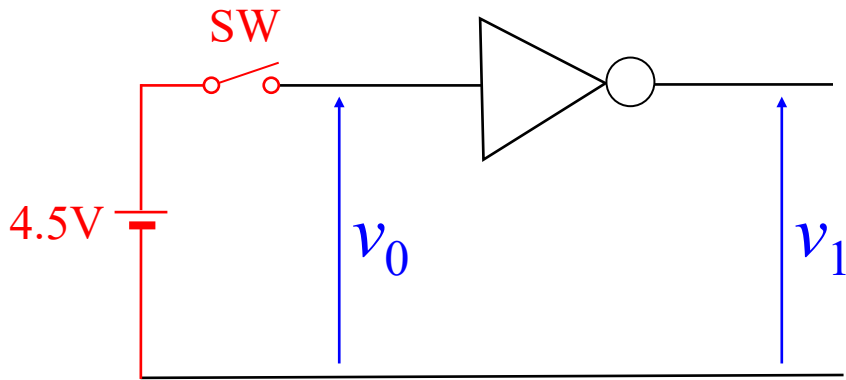
記号表示



$Y =$

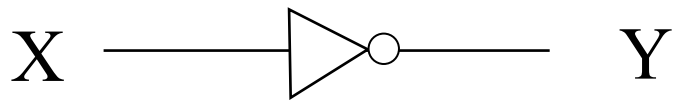
X	Y

実際の回路



SW	v_0 [V]	v_1 [V]
OFF		
ON		

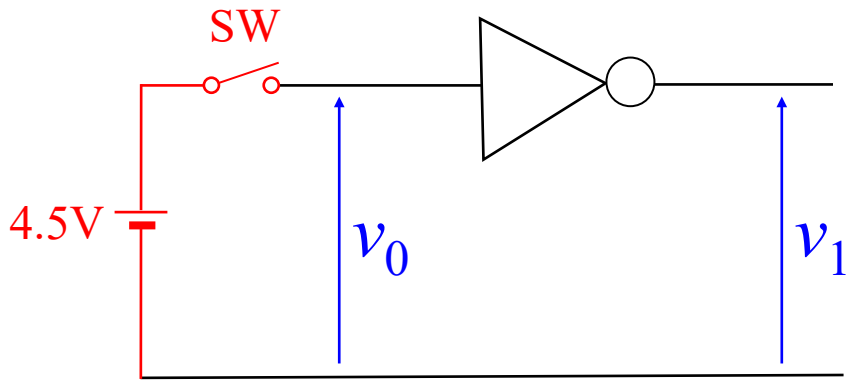
記号表示



$Y =$

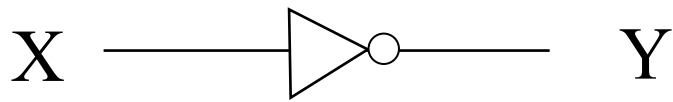
X	Y

実際の回路



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

記号表示

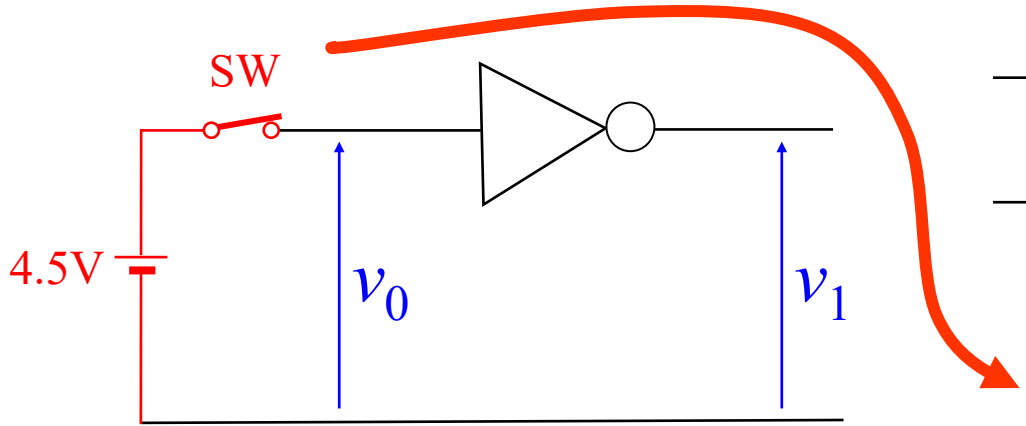


$$Y =$$

X	Y

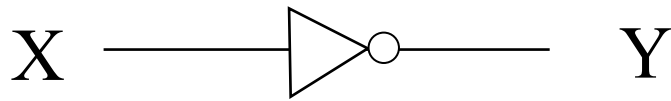
スイッチ投入

実際の回路



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

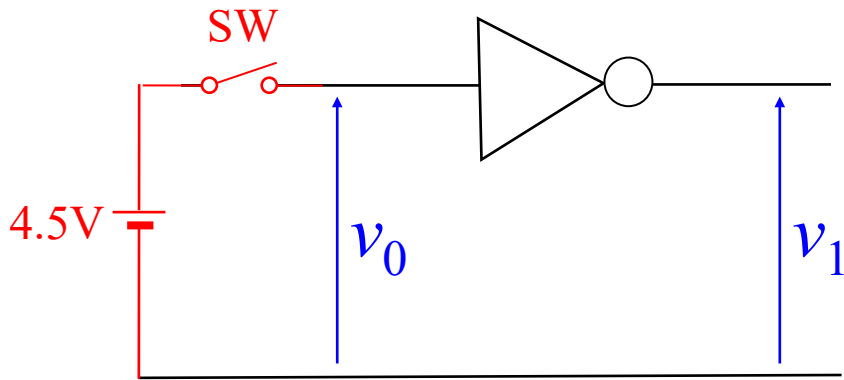
記号表示



$Y =$

X	Y

実際の回路

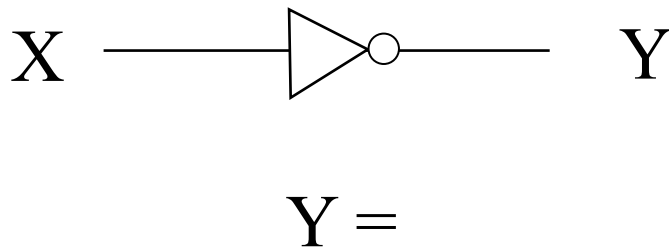


SW	v_0 [V]	v_1 [V]
OFF	0	4.5
ON	4.5	0

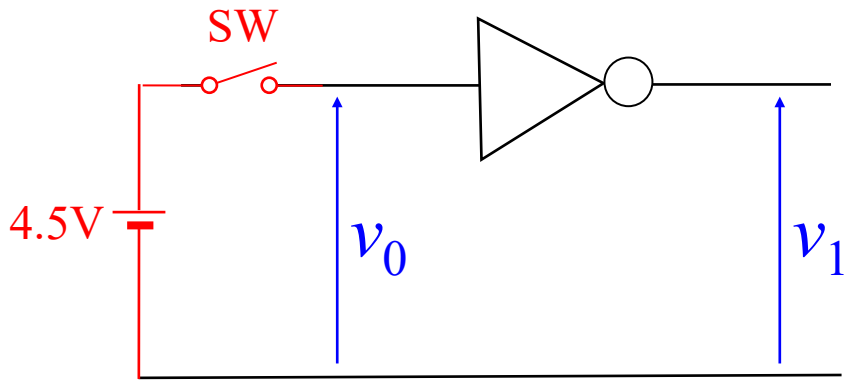
真理値表

X	Y
0	1
1	0

記号表示

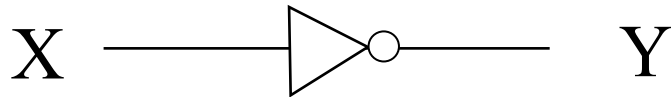


実際の回路



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

記号表示

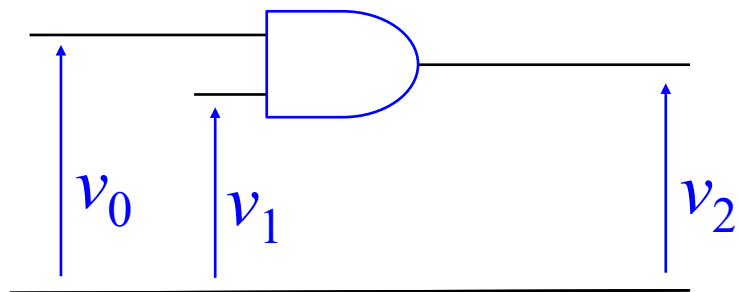


$$Y = \overline{X}$$

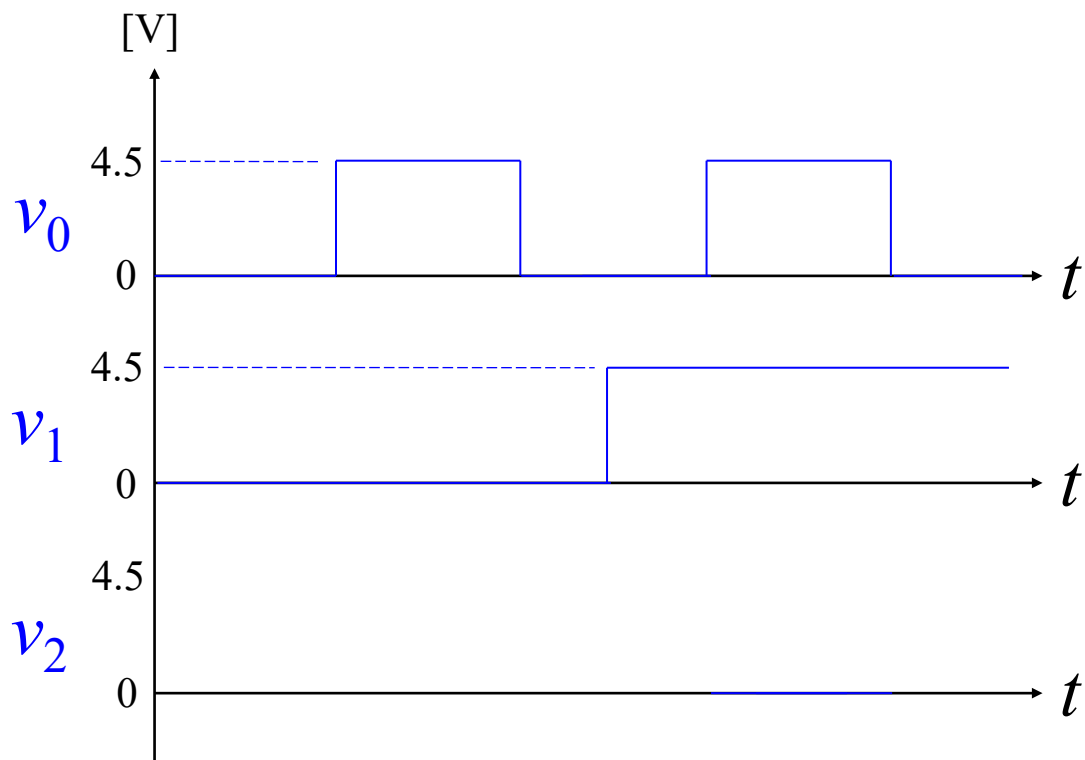
真理値表

X	Y
0	1
1	0

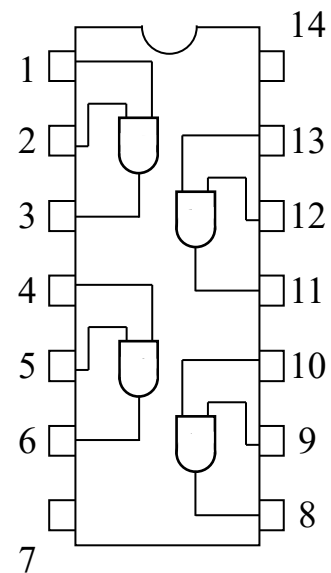
2.1.2 AND回路



4.5V 

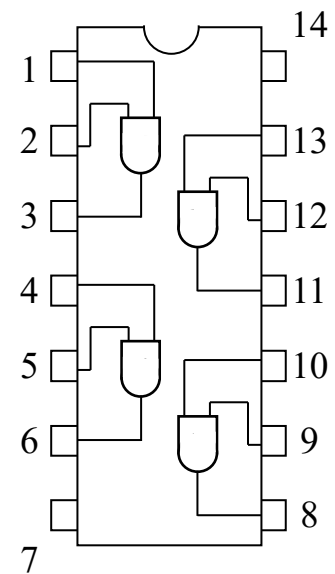
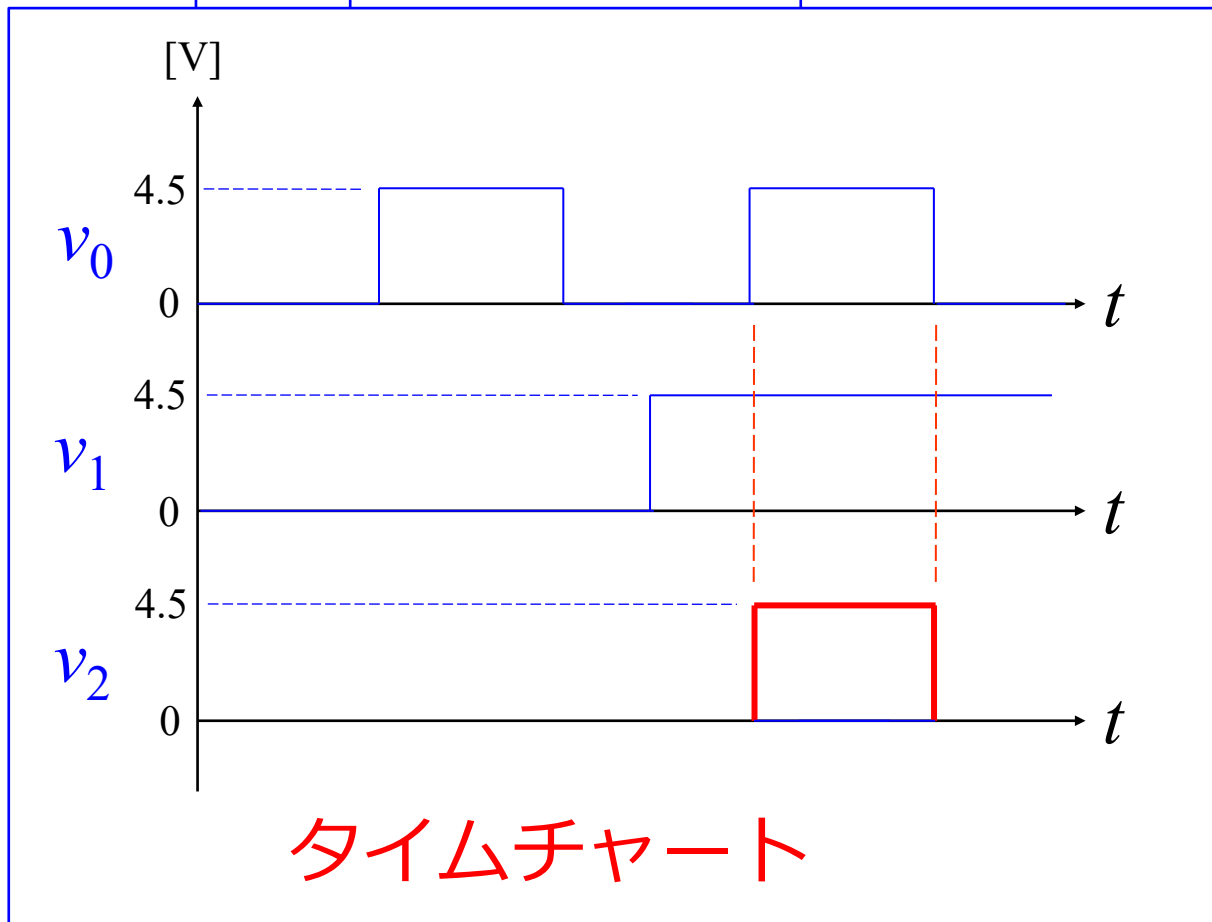
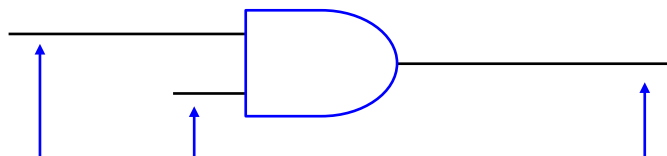


タイムチャート



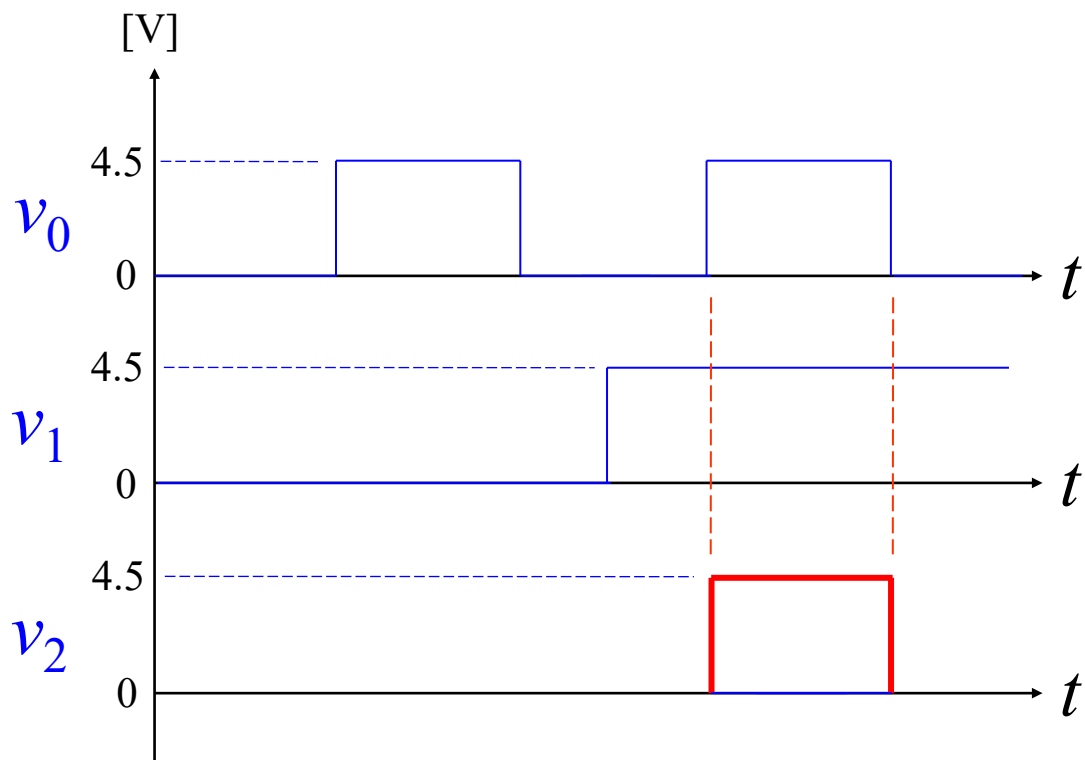
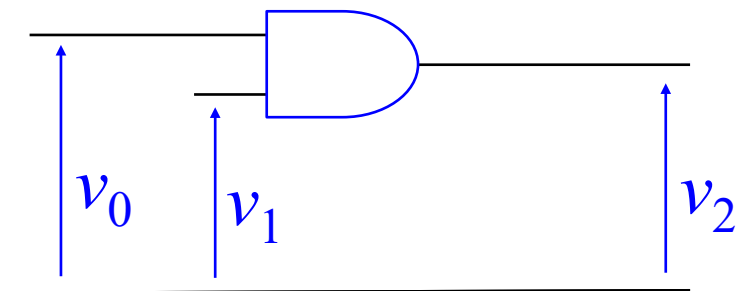
TC74HC08AP
AND回路

AND回路

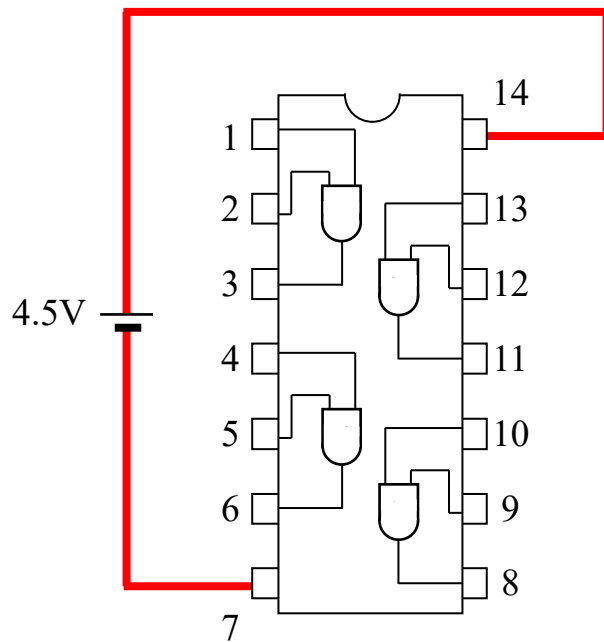


TC74HC08AP
AND回路

AND回路

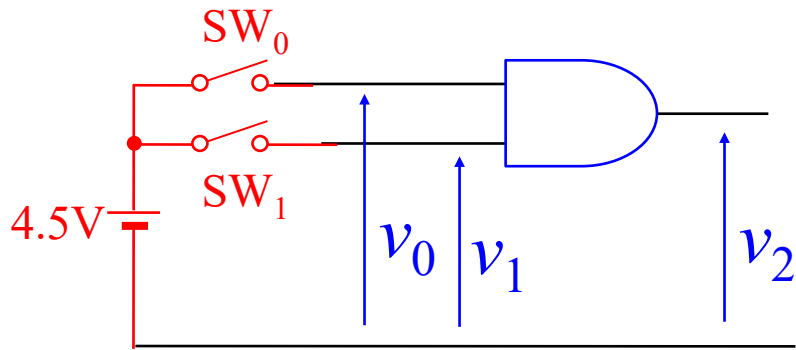


タイムチャート



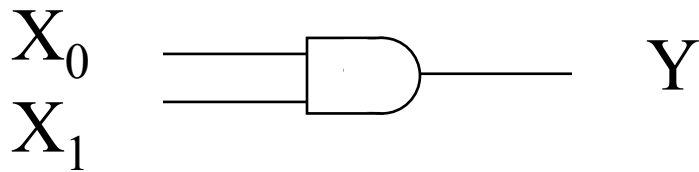
TC74HC08AP
AND回路

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

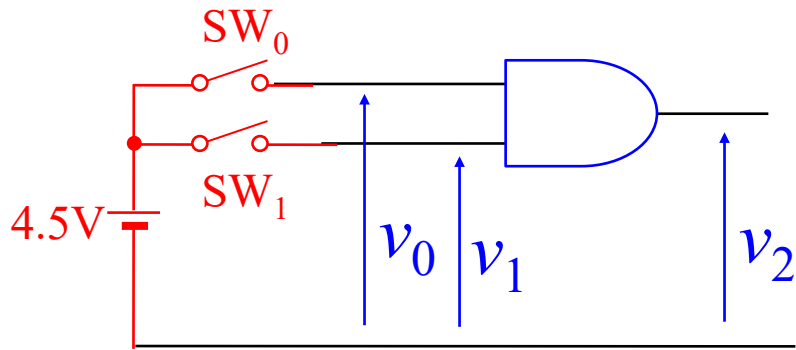


$Y =$

真理値表

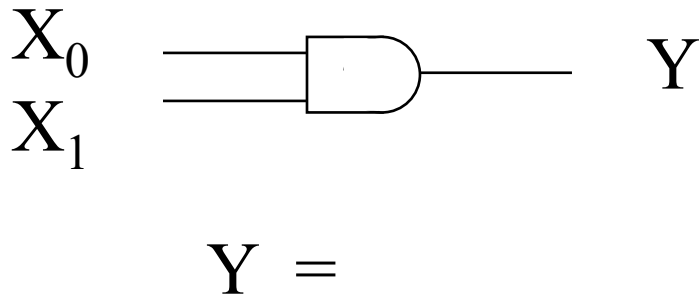
X ₁	X ₀	Y
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実際の回路



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

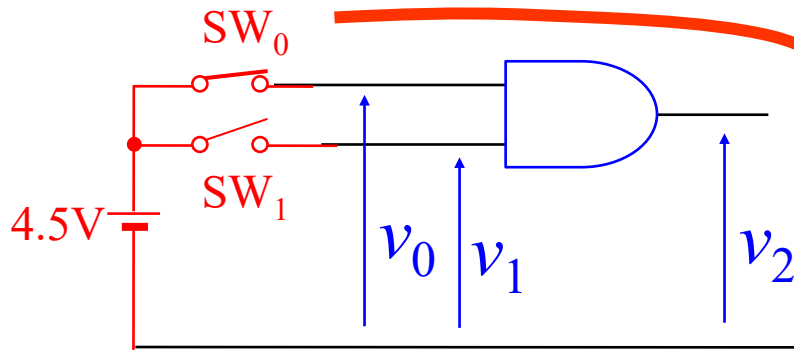
記号表示



真理値表

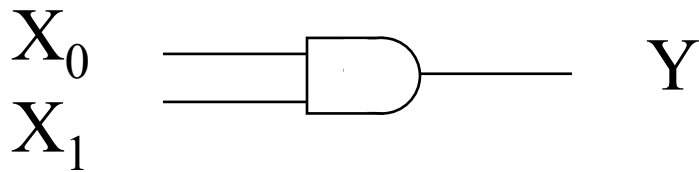
X ₁	X ₀	Y
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実際の回路 スイッチ投入



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

記号表示

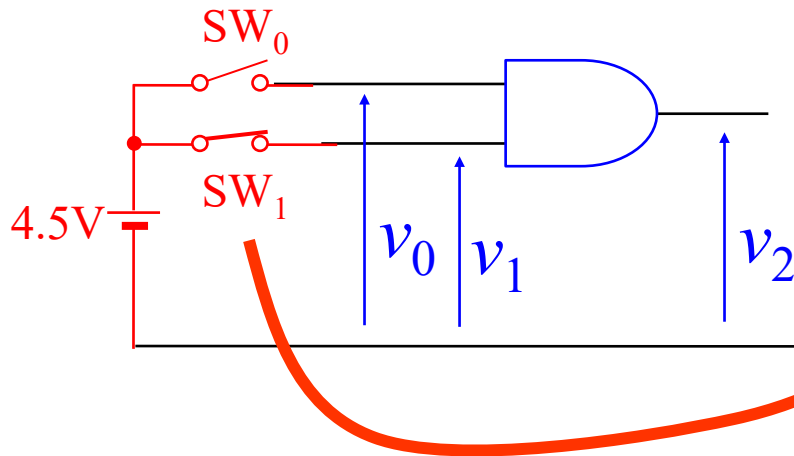


$Y =$

真理値表

X_1	X_0	Y

実際の回路

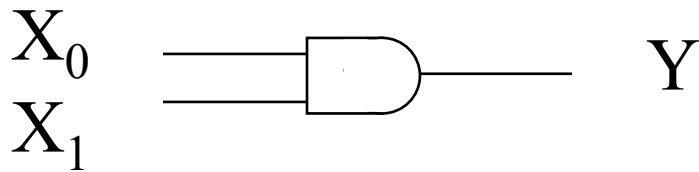


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0

真理値表

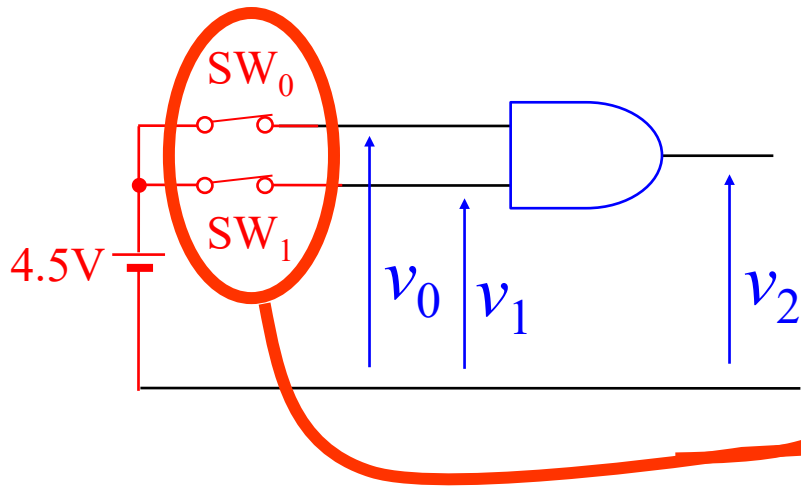
X_1	X_0	Y
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記号表示



$Y =$

実際の回路

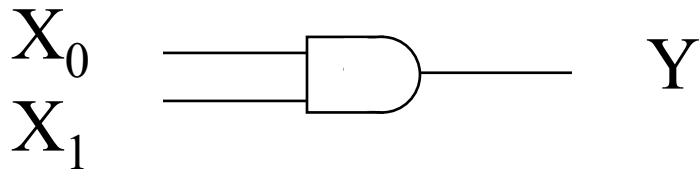


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0
ON	ON	4.5	4.5	4.5

真理値表

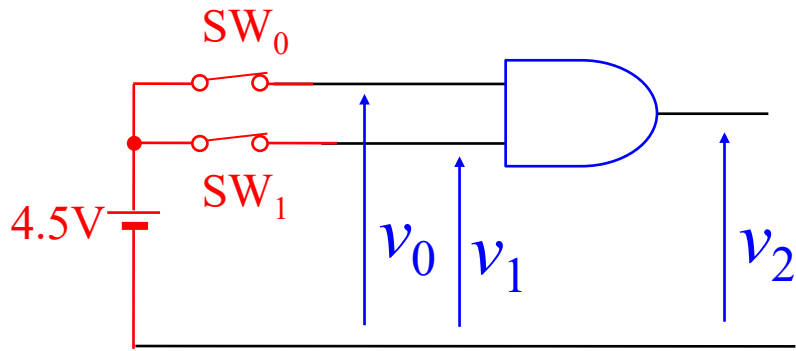
X_1	X_0	Y

記号表示



$$Y =$$

実際の回路

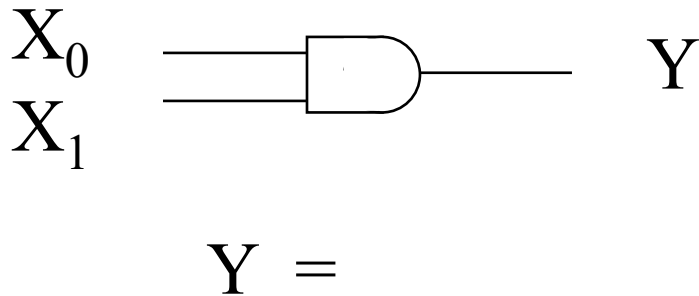


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	0
ON	OFF	4.5	0	0
ON	ON	4.5	4.5	4.5

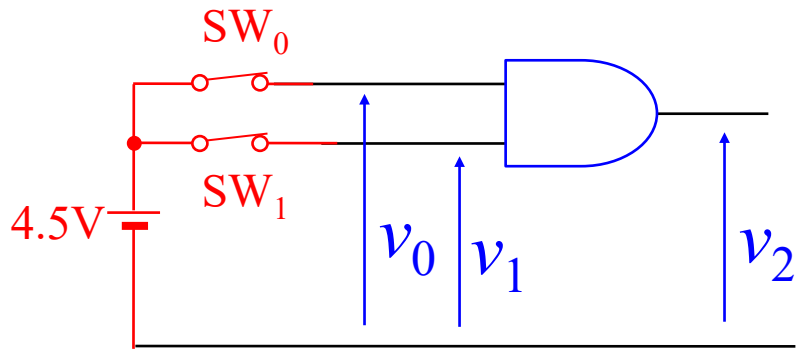
真理値表

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

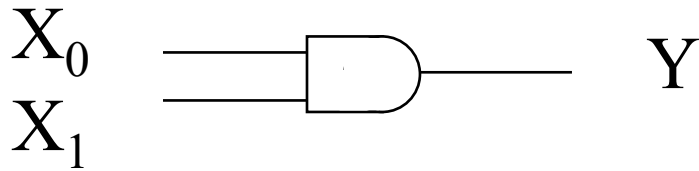
記号表示



実際の回路



記号表示



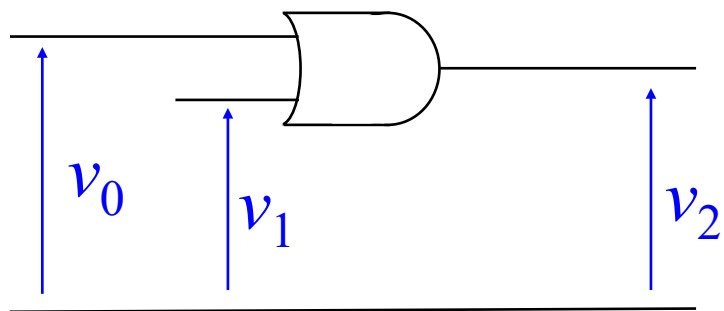
$$Y = X_1 X_0$$


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

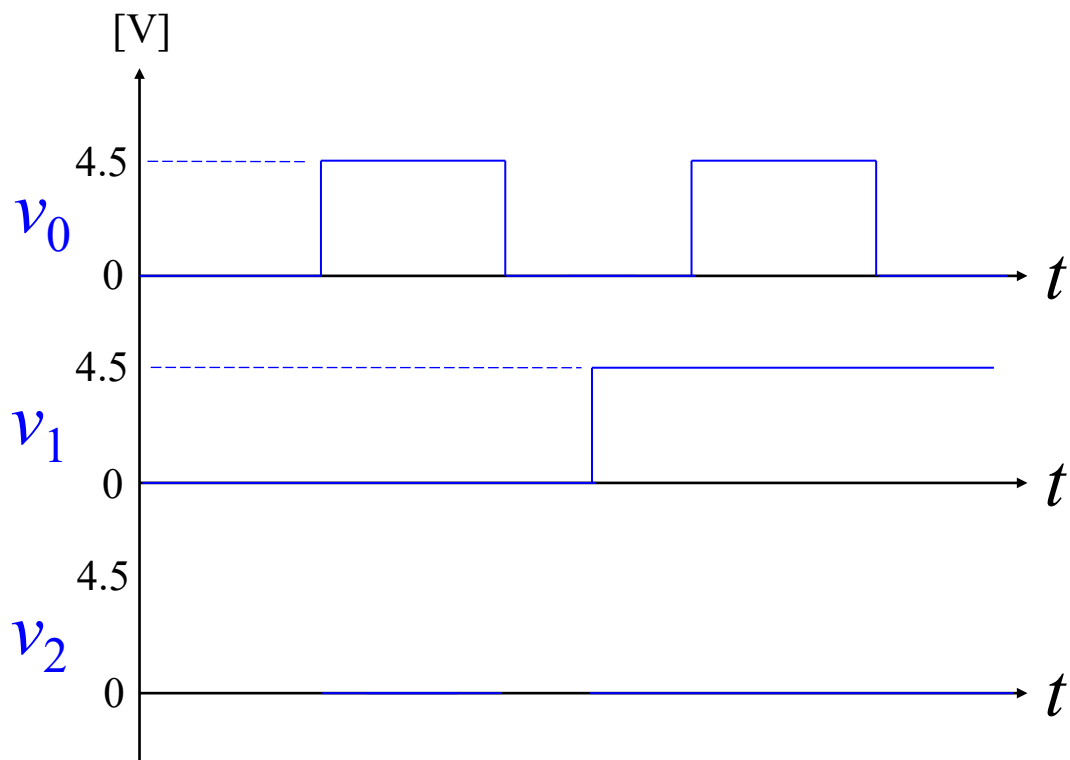
真理値表

X ₁	X ₀	Y
0	0	0
0	1	0
1	0	0
1	1	1

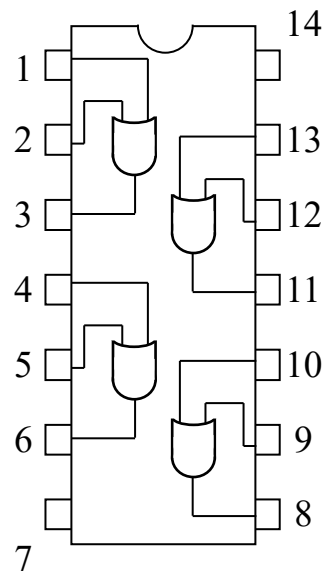
OR回路



4.5V 

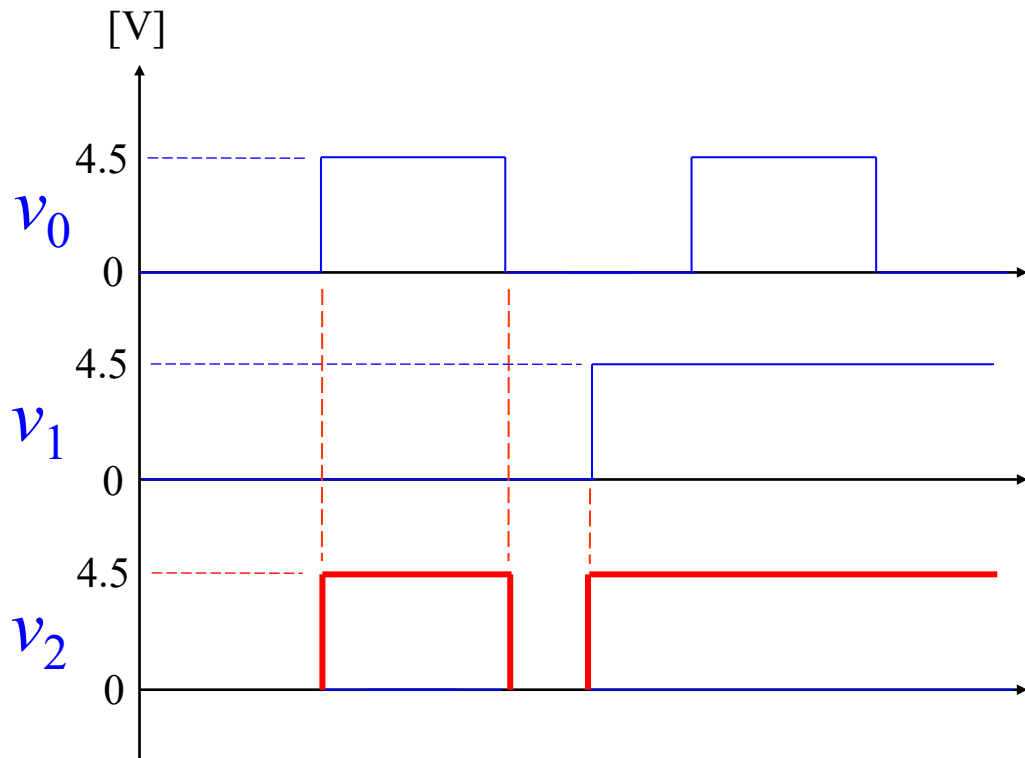
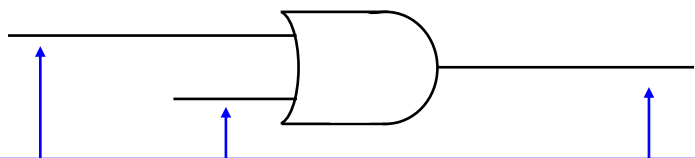


タイムチャート

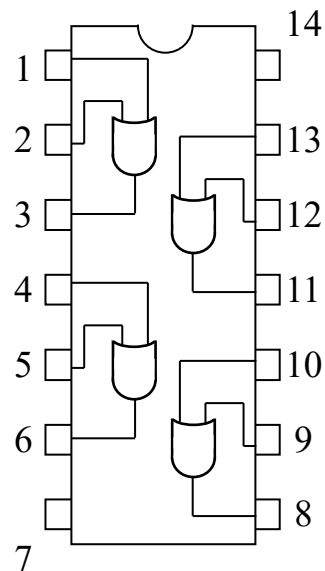


TC74HC32AP
OR回路

OR回路

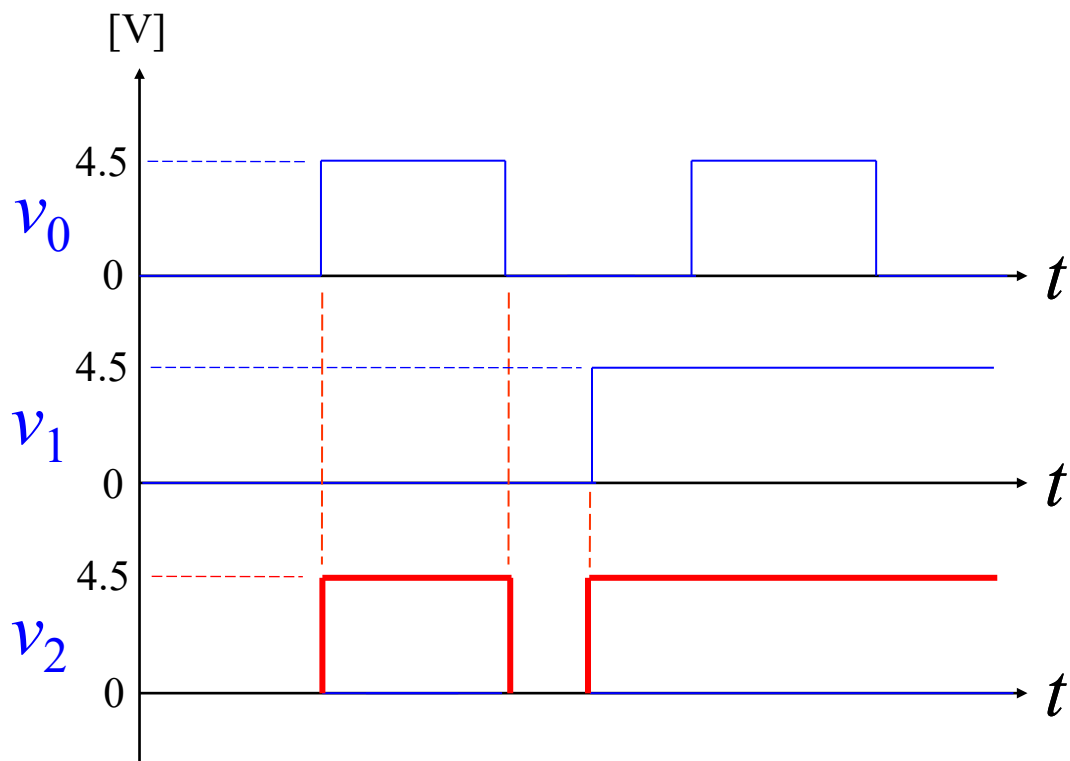
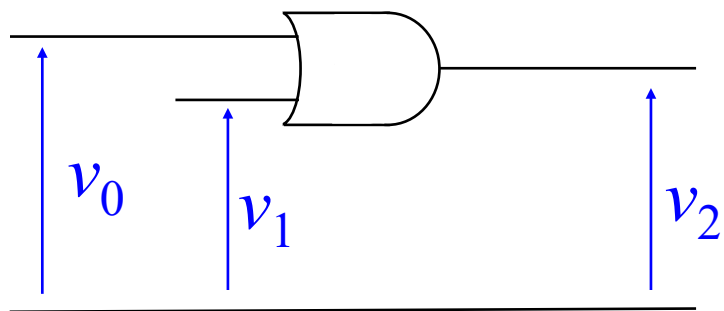


タイムチャート

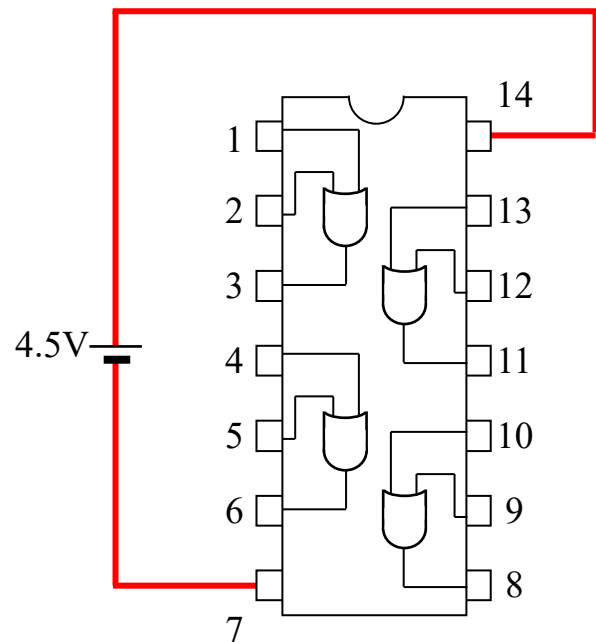


TC74HC32AP
OR回路

OR回路

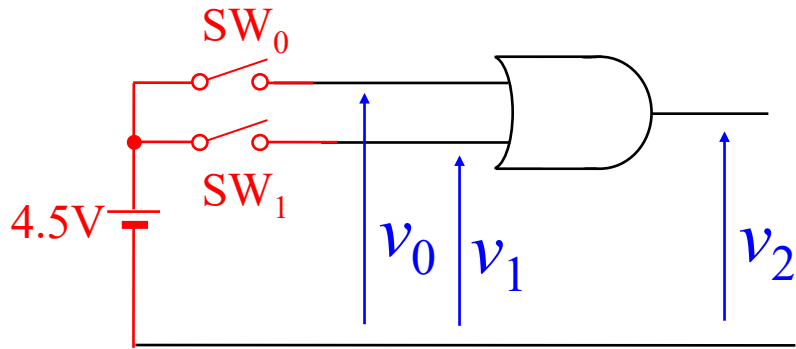


タイムチャート



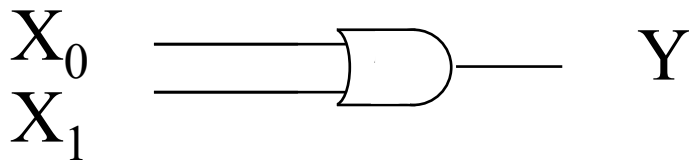
TC74HC32AP
OR回路

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

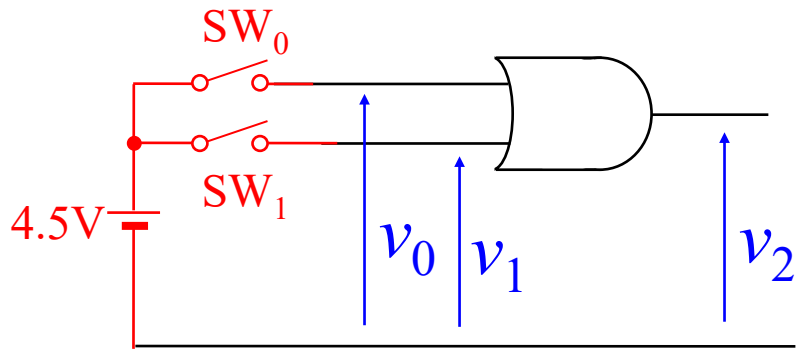


Y =

真理値表

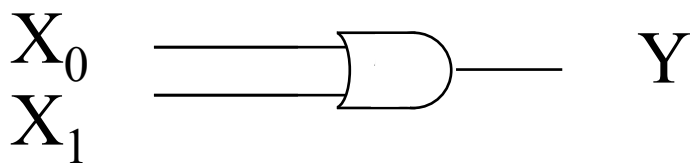
X ₁	X ₀	Y
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実際の回路



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

記号表示

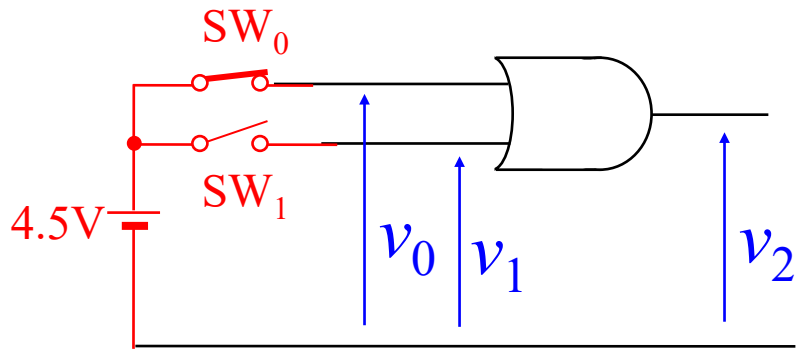


Y =

真理値表

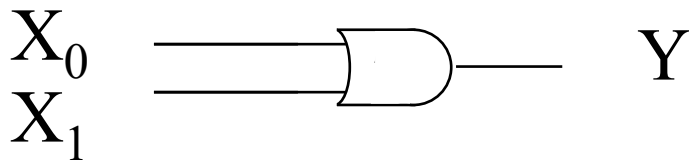
X ₁	X ₀	Y
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実際の回路



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

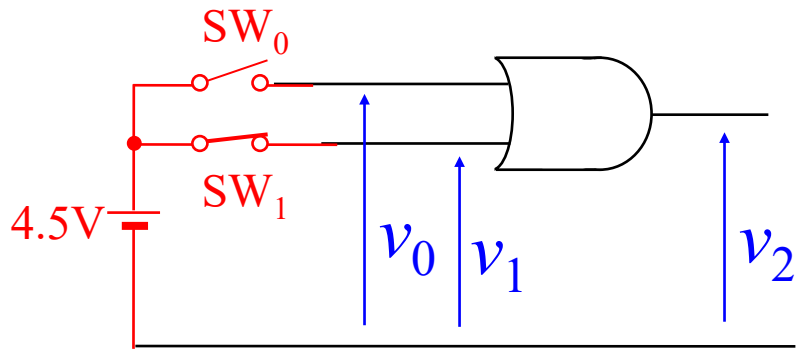


$$Y =$$

真理値表

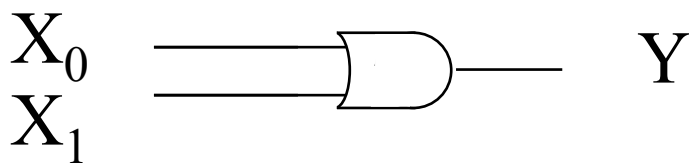
X ₁	X ₀	Y

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

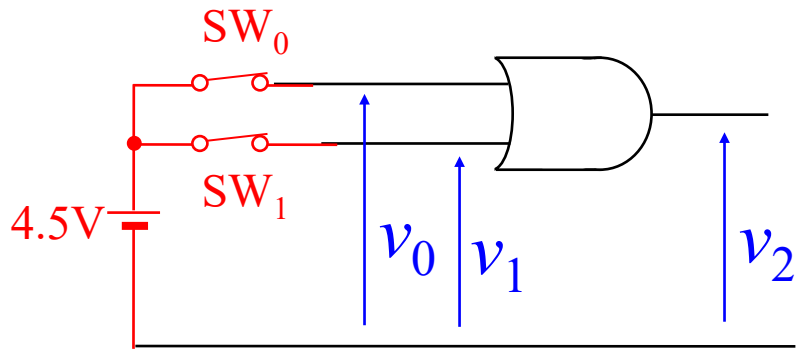


$$Y =$$

真理値表

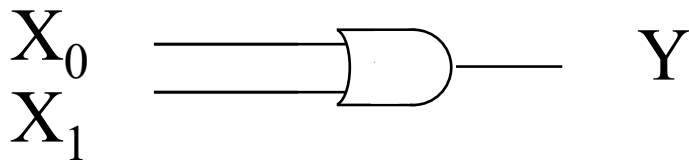
X_1	X_0	Y

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

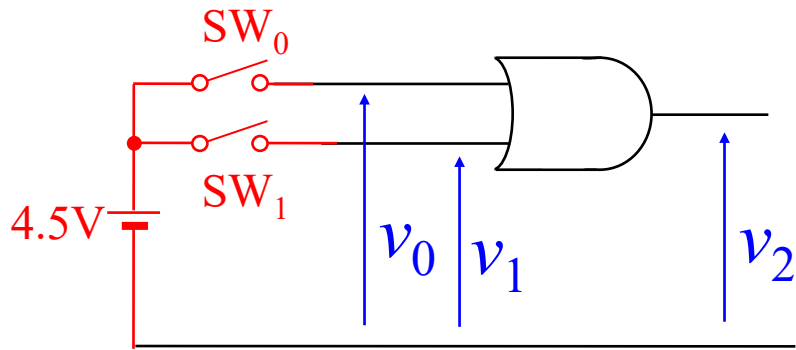


$$Y =$$

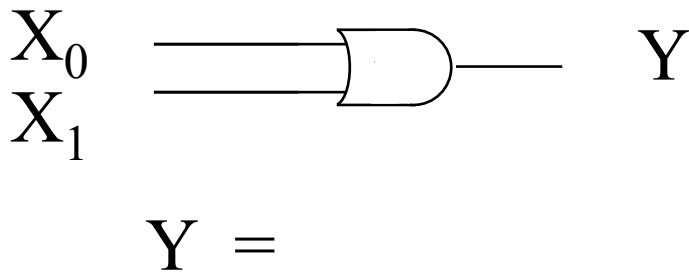
真理値表

X ₁	X ₀	Y

実際の回路



記号表示

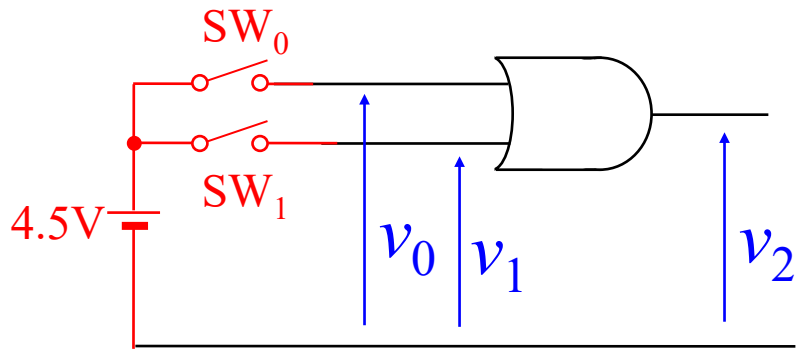


SW_1	SW_0	v_1 [V]	v_0 [V]	v_2 [V]
OFF	OFF	0	0	0
OFF	ON	0	4.5	4.5
ON	OFF	4.5	0	4.5
ON	ON	4.5	4.5	4.5

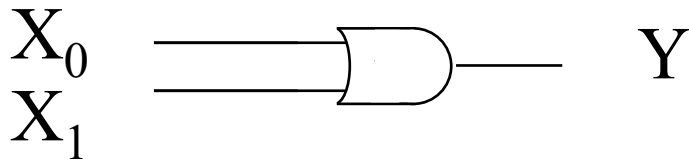
真理値表

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

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

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

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

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

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

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

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

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

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

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		

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

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

X_1	X_0	X_1X_0	$\overline{X_1} \wedge \overline{X_0}$	$\overline{X_1} \vee \overline{X_0}$
0	0	0	1	1
0	1	0	1	1
1	0	0	0	1
1	1	1	0	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

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

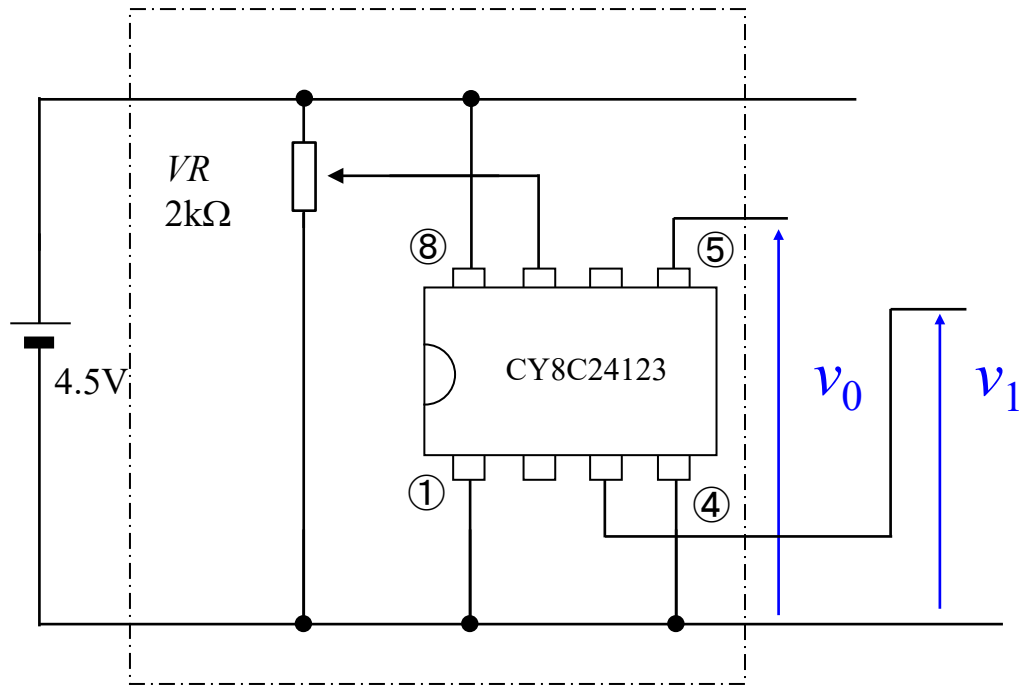
X_1	X_0	$X_1 X_0$	$X_0 + X_1 X_0$
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	1

$X_0(X_1 + X_0) = X_0$ 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

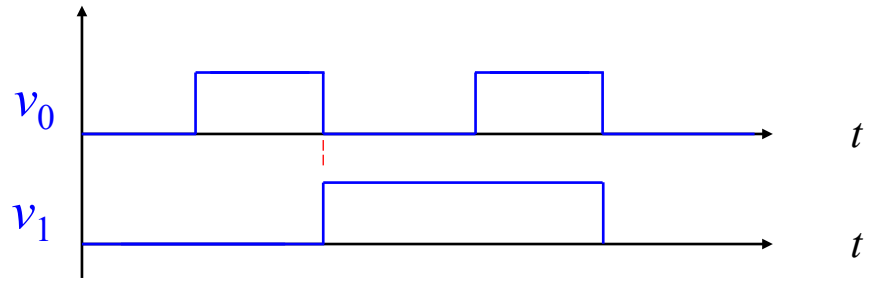
X_1	X_0	$X_1 X_0$	$\overline{X_1 X_0}$	$\overline{X_1}$	$\overline{X_0}$	$\overline{X_1} + \overline{X_0}$
0	0	0	1	1	1	1
0	1	0	1	1	0	1
1	0	0	1	0	1	1
1	1	1	0	0	0	0



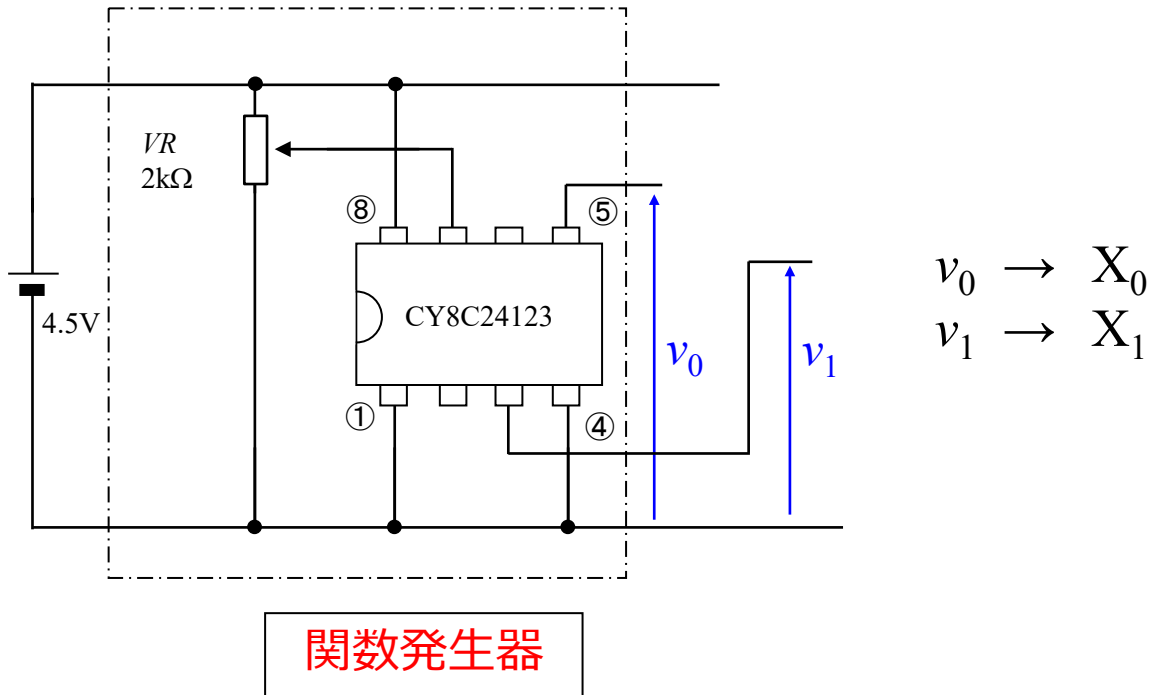
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

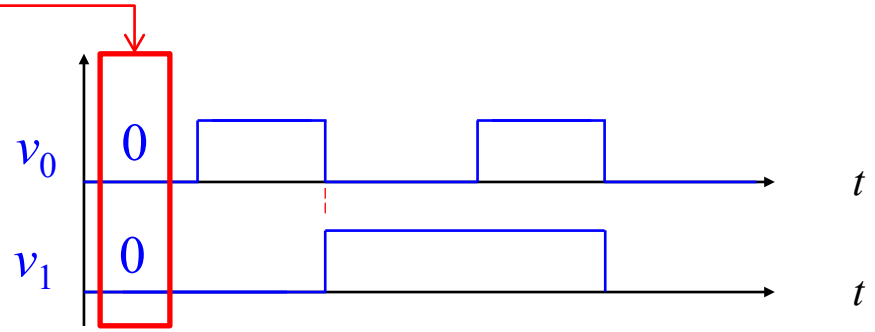
X_1	X_0
0	0
0	1
1	0
1	1



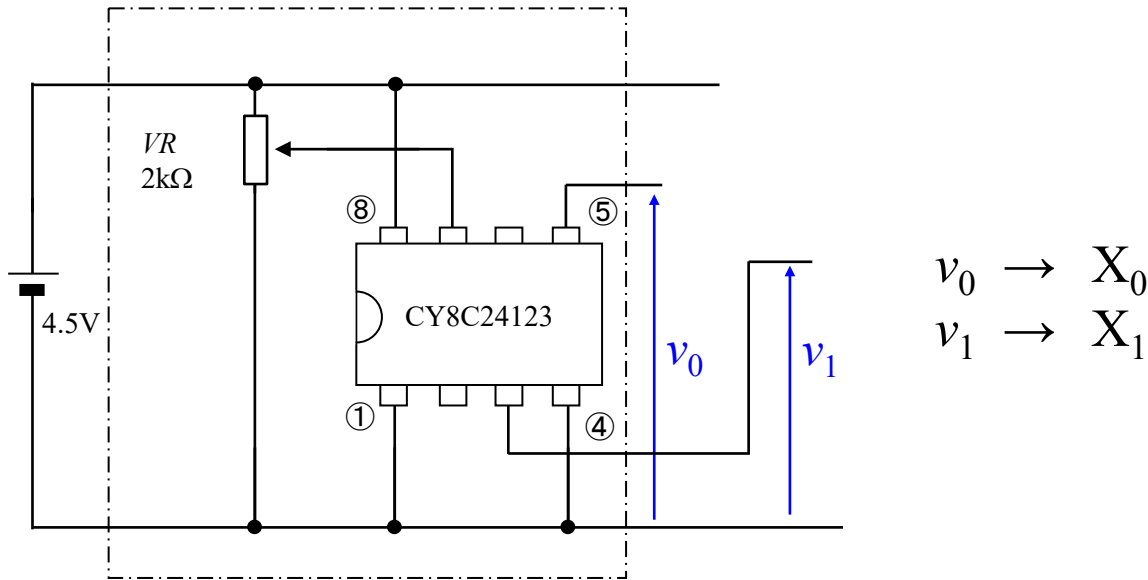
タイムチャート



X_1	X_0
0	0
0	1
1	0
1	1

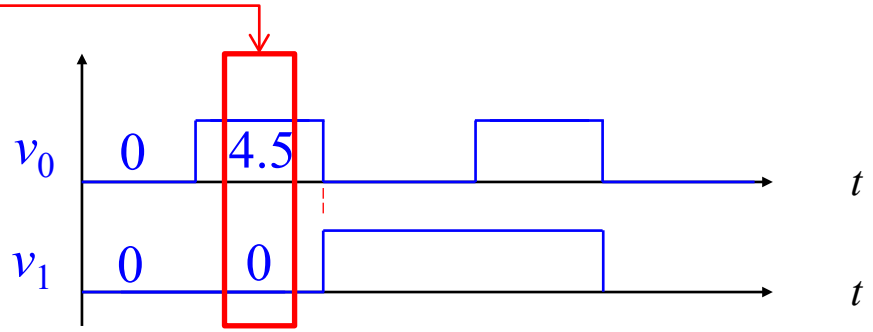


タイムチャート

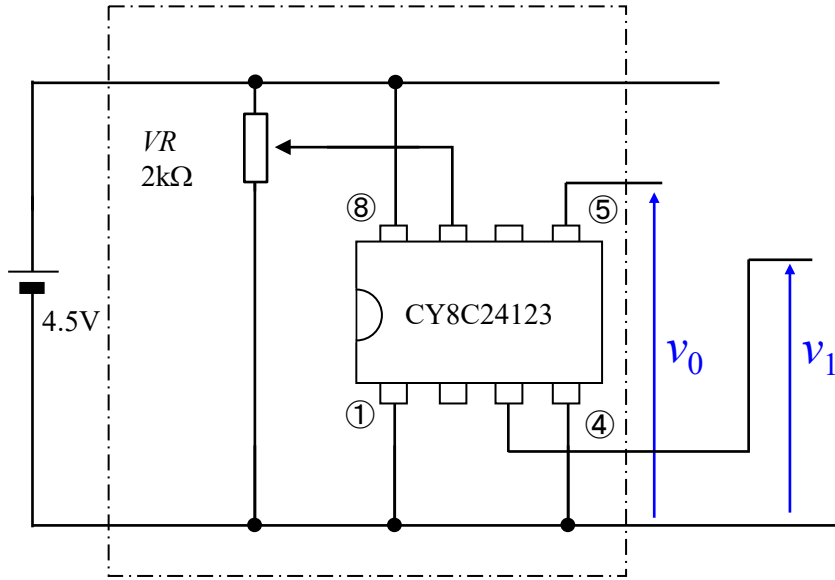


関数発生器

X_1	X_0
0	0
0	1
1	0
1	1



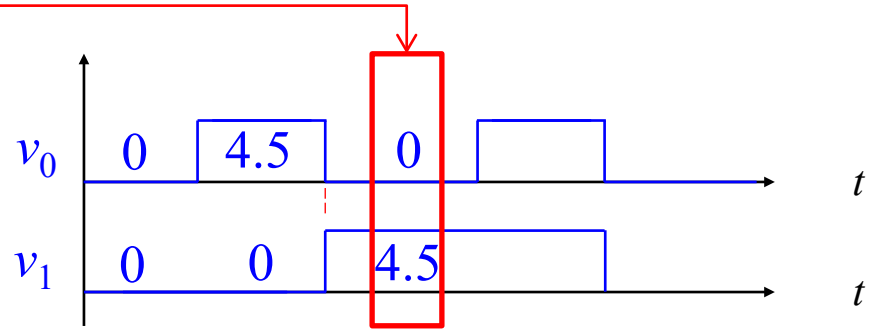
タイムチャート



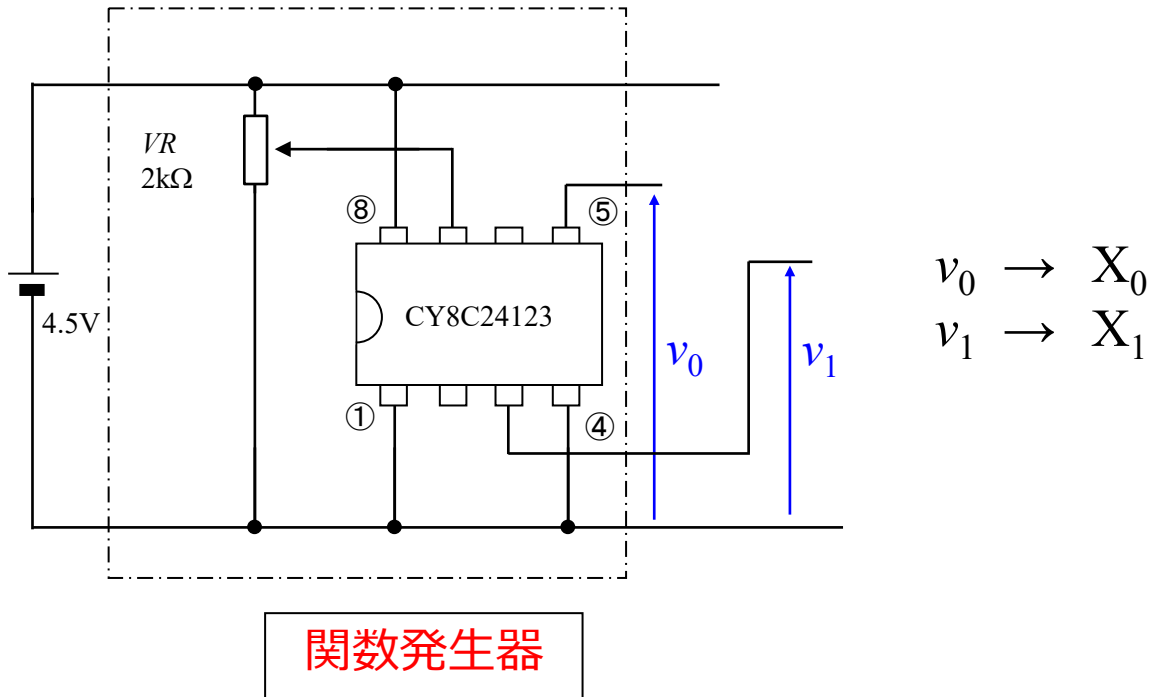
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

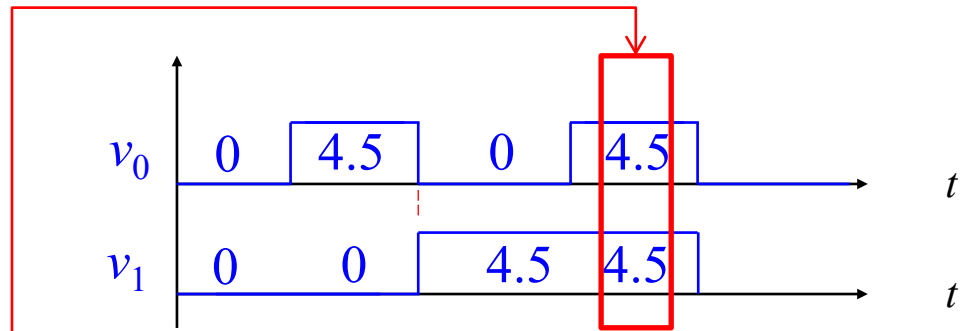
X_1	X_0
0	0
0	1
1	0
1	1



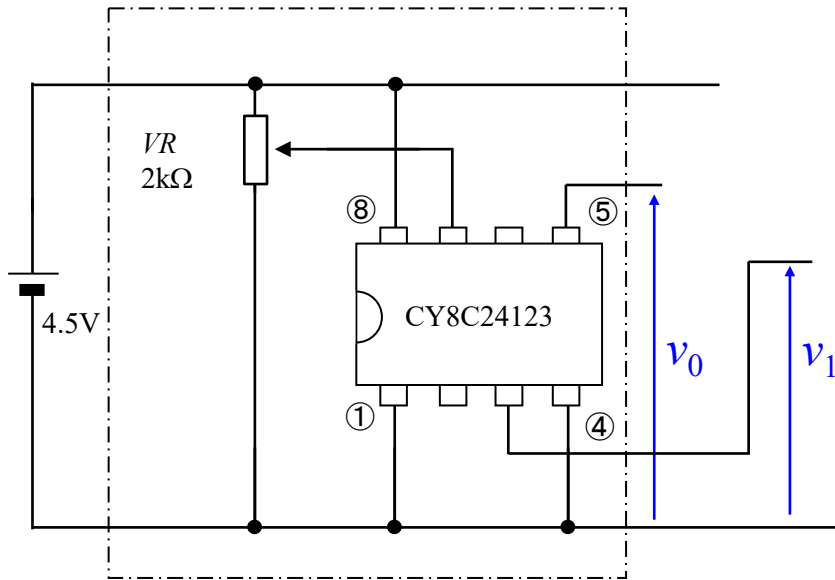
タイムチャート



X_1	X_0
0	0
0	1
1	0
1	1



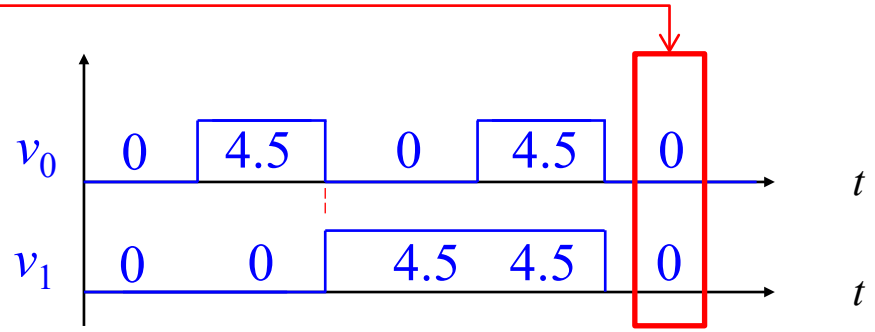
タイムチャート



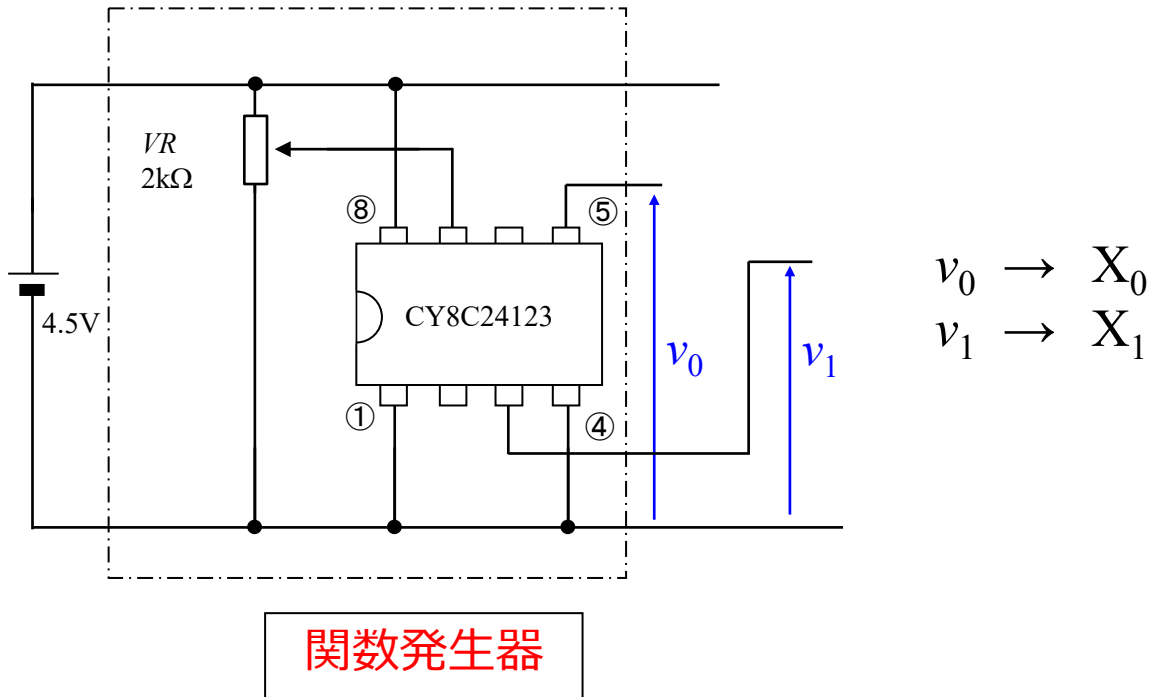
$v_0 \rightarrow X_0$
 $v_1 \rightarrow X_1$

関数発生器

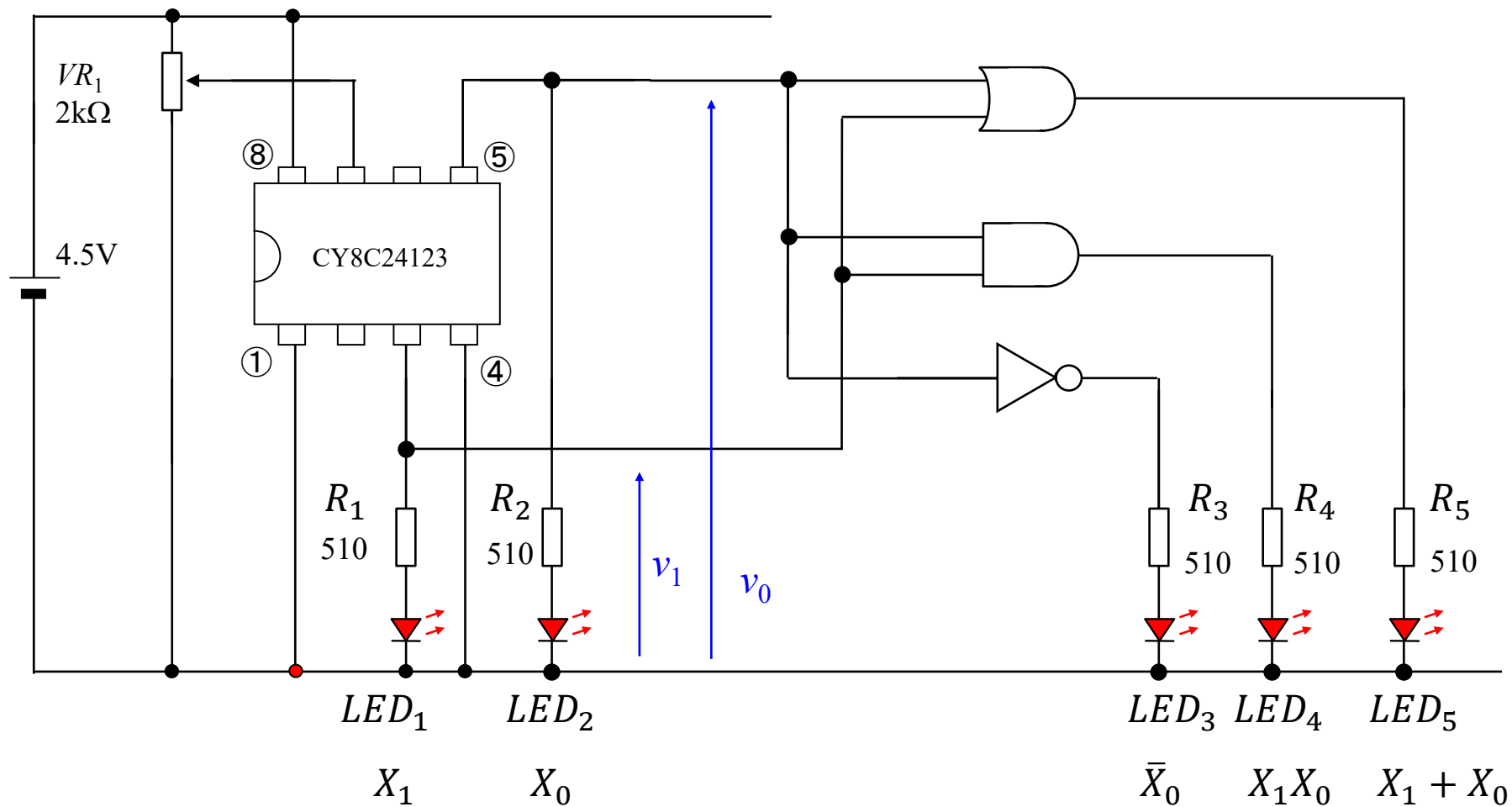
X_1	X_0
0	0
0	1
1	0
1	1



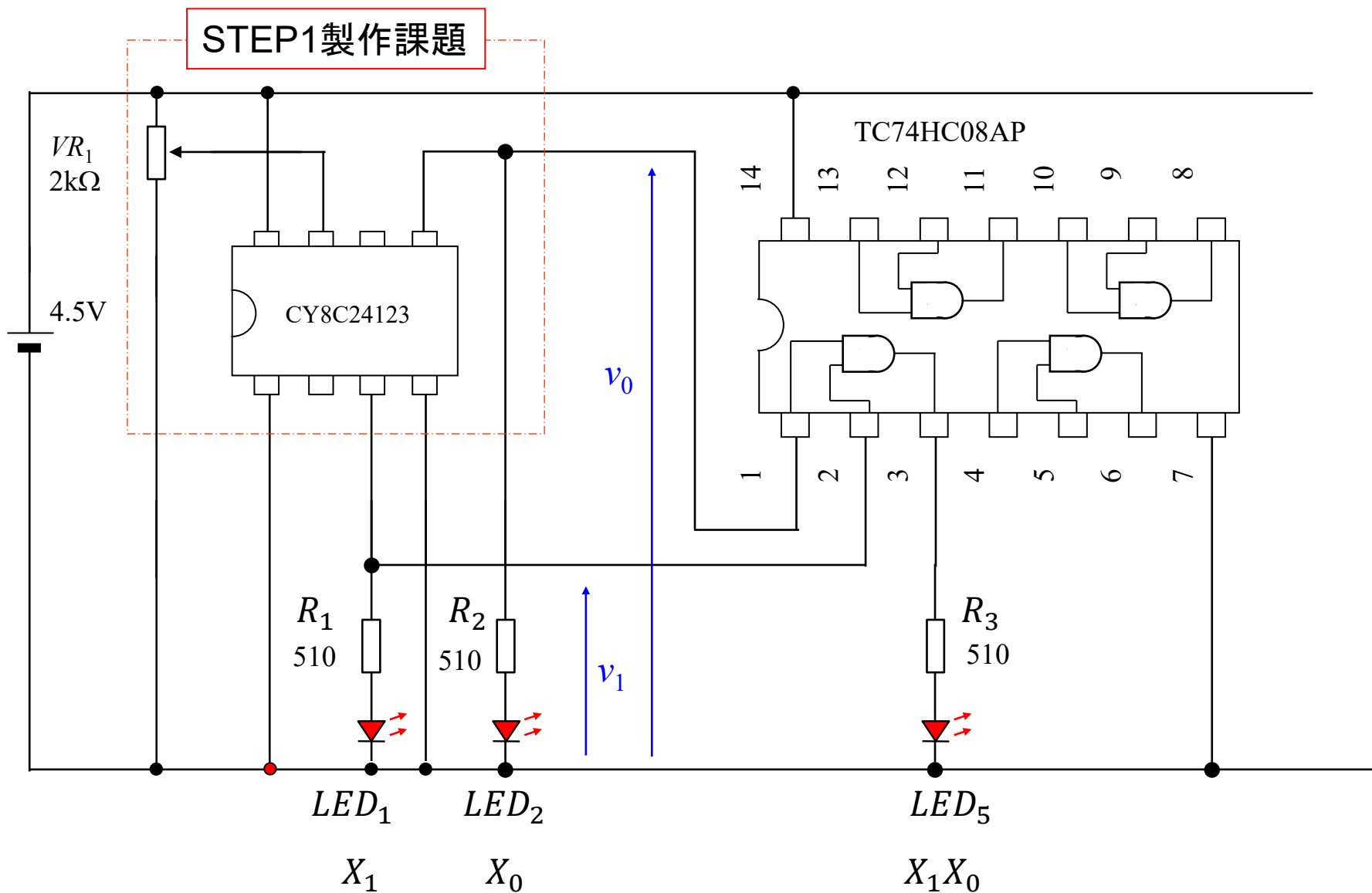
タイムチャート



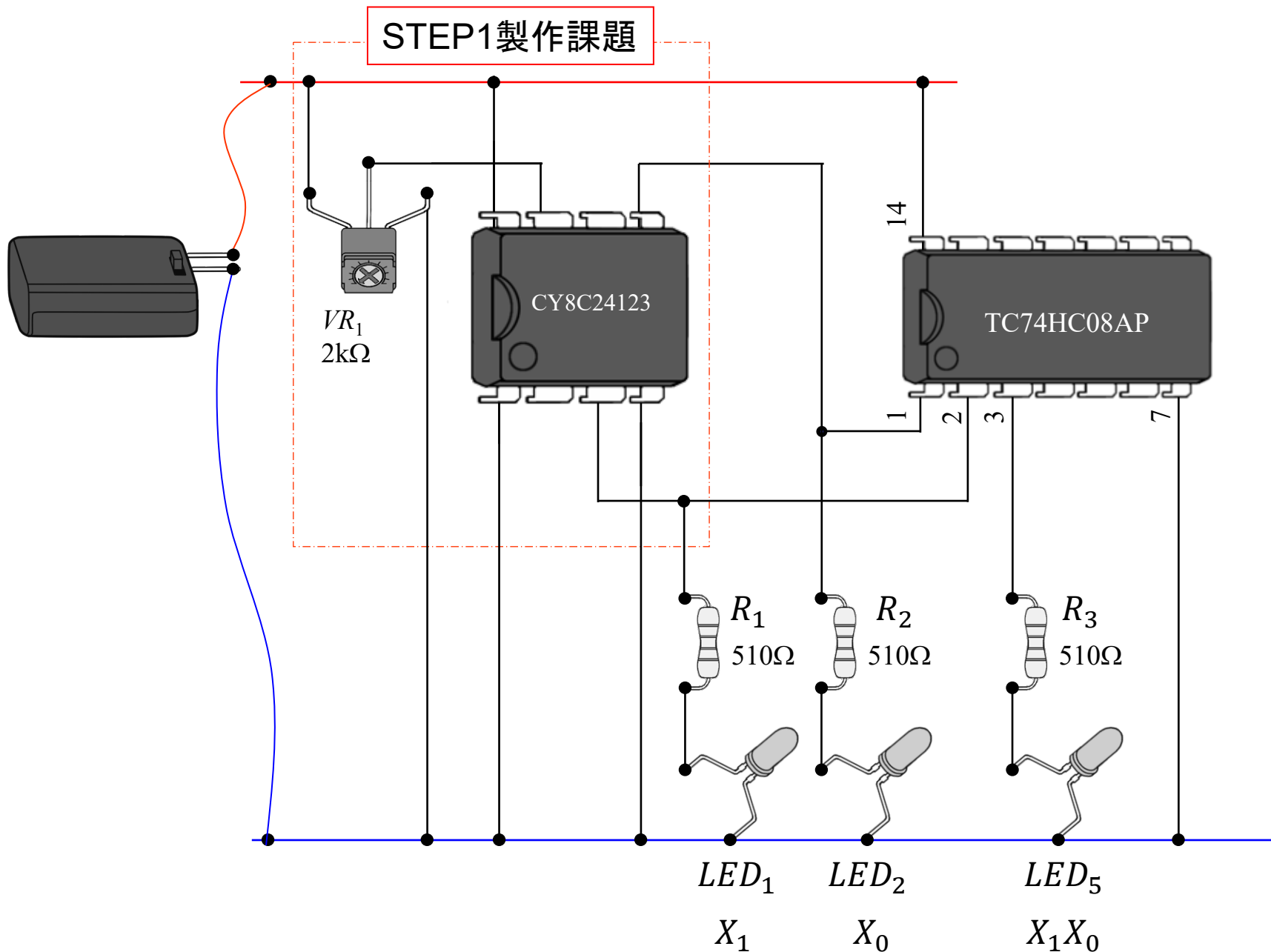
STEP2 製作課題 以下の回路を製作し, AND, OR, NOT回路の働きを確認せよ.



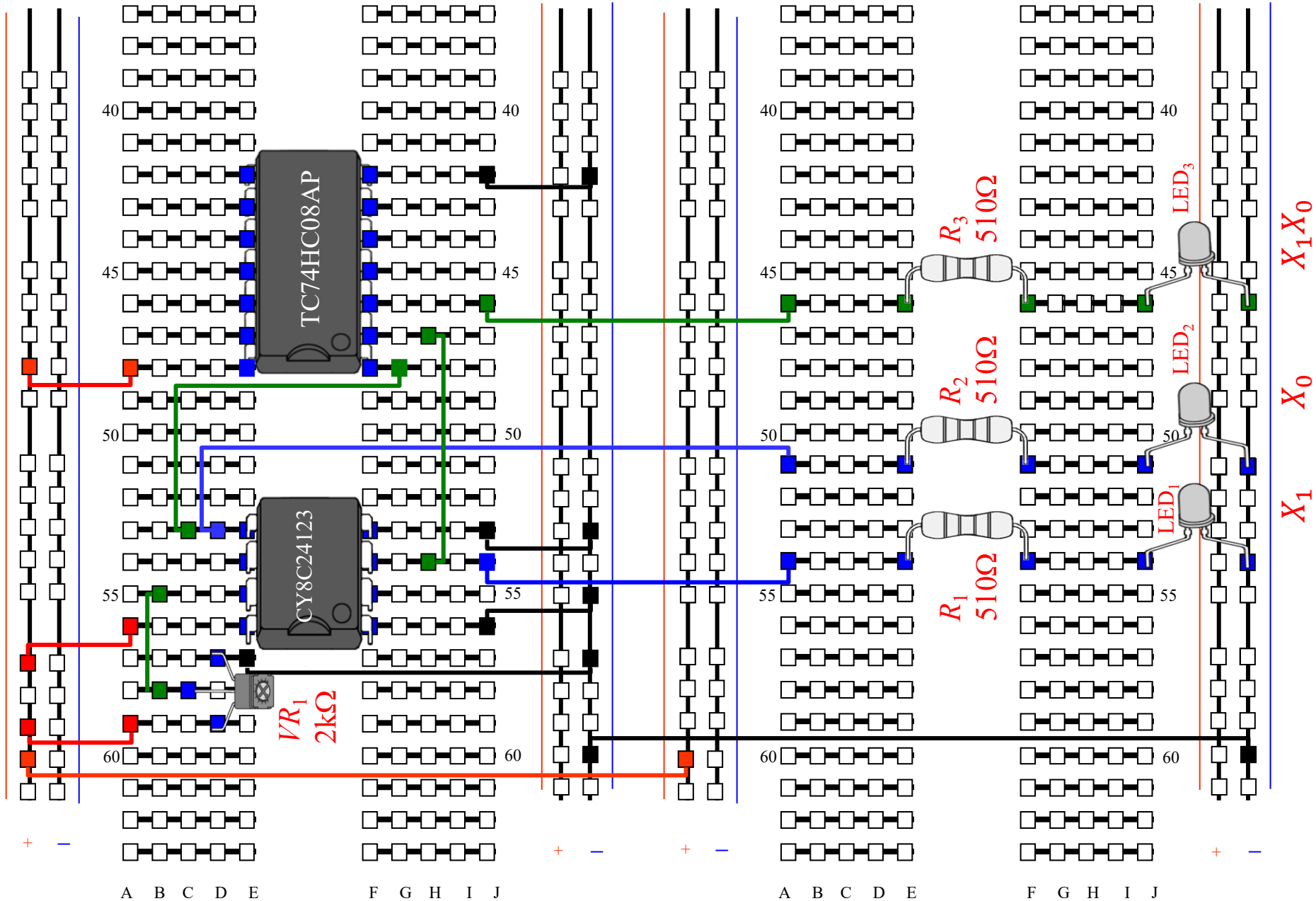
STEP2 製作課題 (解答の一部) AND回路部分のみを示す.



STEP2 製作課題 (解答の一部) AND回路部分のみを示す



STEP2 製作課題 (解答の一部) AND回路部分のみを示す.



ビデオ

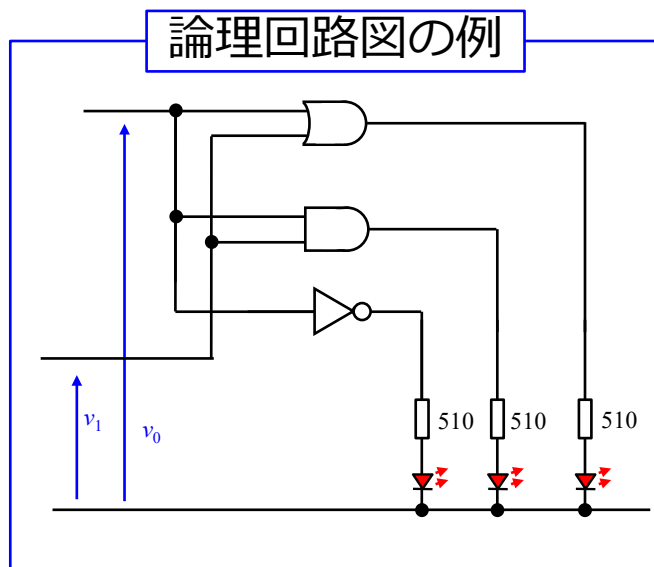
http://mybook-pub-site.sakura.ne.jp/digital_circuit/Exercise1/Exercise1.mp4

STEP2 (ボーナス課題) できれば+1点とする.

論理式

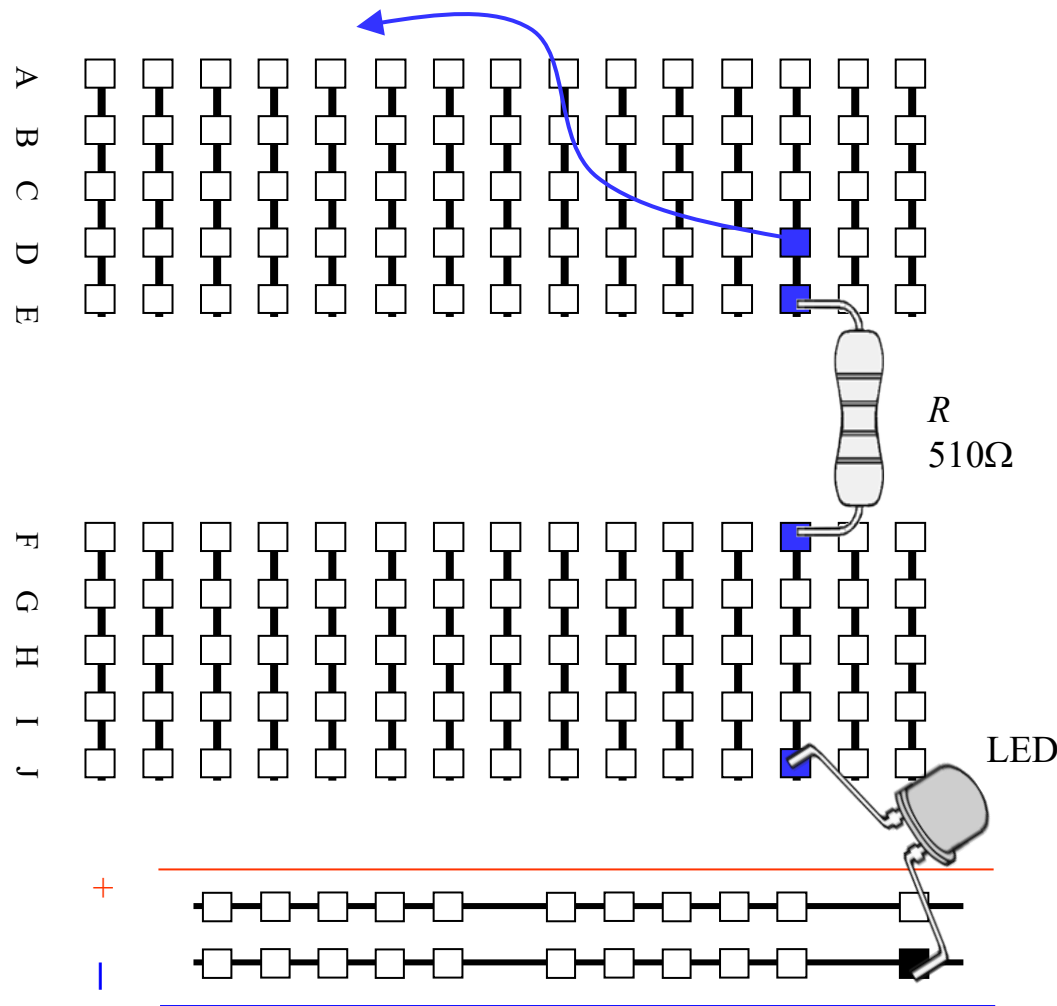
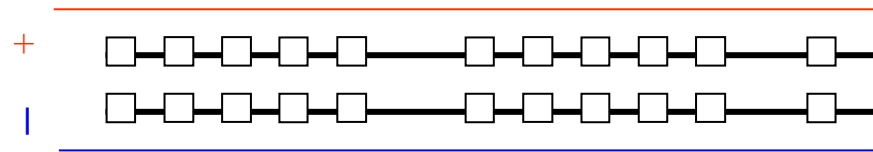
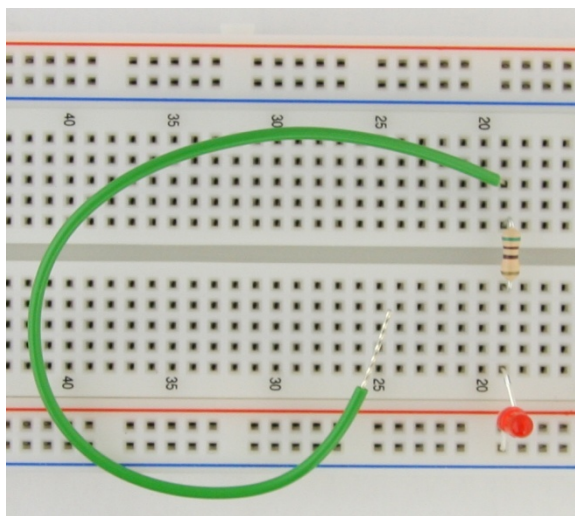
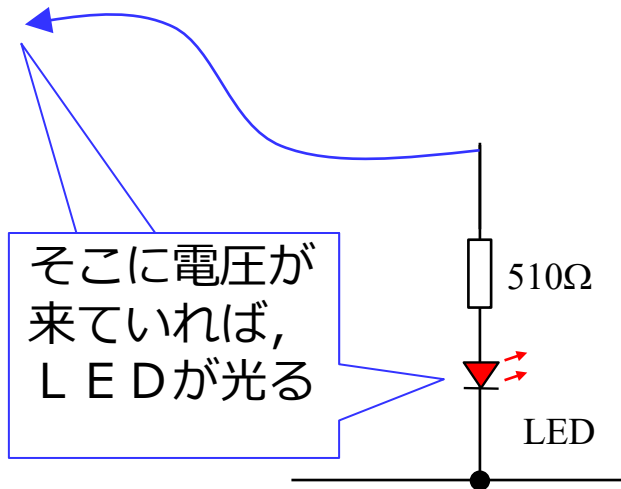
$$\overline{X_1 + X_0} = \overline{X_1} \overline{X_0}$$

の左辺の項を実現する論理回路と右辺の項を実現する論理回路をそれぞれ作製し、両回路が同じ動作をすることを確認せよ。ただし、AND, OR, NOT回路（複数利用可）のみを用いよ。TAにチェックを受けるときは、紙に書いた論理回路図と製作した回路の両方を見せること。（ヒント：左辺の項はOR回路とNOT回路で作れる。）
締め切り：翌週の講義開始時点（TAの机の上に置いておけばよい）



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)

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