

数字电子技术第四次作业

31 列出真值表 A B C Y (续)

0	0	0	1	1	0	0
0	0	1	0	1	0	1
0	1	0	0	1	0	1
0	1	1	1	1	1	0

逻辑表达式为 $Y = \overline{ABC} + \overline{ACB} + ABC + \overline{BAC} = \overline{A} \oplus B \oplus C$

可以用于检测A.B.C中是否有奇数个'1'

32 解 S₀ S₁ S₂ S₃ Y (续表)

0	0	0	0	1	1	0	0	$\overline{A} + \overline{B}$
0	0	0	1	$A + B$	1	0	0	$A \oplus B$
0	0	1	0	$\overline{A} + B$	1	0	1	\overline{A}
0	0	1	1	B	1	0	1	$\overline{A}B$
0	1	0	0	$A + \overline{B}$	1	1	0	\overline{B}
0	1	0	1	A	1	1	0	$\overline{A}B$
0	1	1	0	$\overline{A} \oplus B$	1	1	1	\overline{AB}
0	1	1	1	AB	1	1	1	0

33 由电路可知 $Y_1 = A \oplus B \oplus C$

$$Y_1 = AB + (A \oplus B)C = AB + AC + BC$$

Y_1 代表A.B.C的求和结果，或者判断A.B.C中是否有奇数个'1'

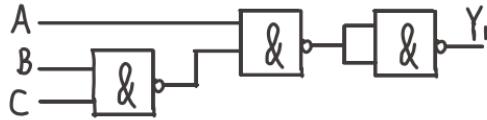
Y_2 代表A.B.C的求和是否产生溢出

35 $Y_1 = m_0 + m_2 + m_4 + m_6 = \overline{C}\overline{B}\overline{A} + \overline{C}B\overline{A} + C\overline{B}\overline{A} + CB\overline{A} = \overline{A}$

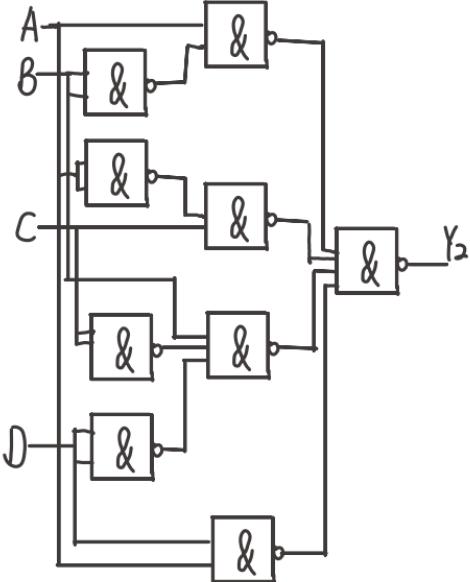
$$Y_2 = m_1 + m_3 + m_5 + m_7 = \overline{C}\overline{B}A + \overline{C}BA + C\overline{B}A + CBA = A$$

$$(1) Y_1 = A\bar{B} + \bar{A}C\bar{D} + A\bar{C} = A\bar{B} + A\bar{C} \quad (2) Y_2 = \bar{A}\bar{B} + \bar{A}\bar{C} + \bar{B}\bar{C} + ABD \\ = A(\bar{B} + \bar{C}) = A\bar{B}\bar{C}$$

电路图

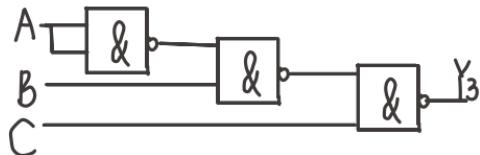


$$(2) Y_2 = \bar{A}\bar{B} + \bar{A}\bar{C} + \bar{B}\bar{C}\bar{D} + ABD \\ = \frac{\bar{A}\bar{B}}{\bar{A}\bar{B} \cdot \bar{A}\bar{C}} + \frac{\bar{A}\bar{C}}{\bar{A}\bar{B} \cdot \bar{A}\bar{C}} + \frac{\bar{B}\bar{C}\bar{D}}{\bar{A}\bar{B} \cdot \bar{A}\bar{C}} + \frac{AD}{\bar{A}\bar{B} \cdot \bar{A}\bar{C}}$$

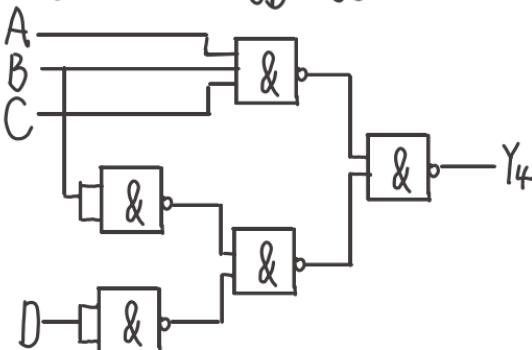


$$(3) Y_3(A,B,C) = \sum(m_0, m_2, m_3, m_4, m_6) \\ = \bar{C} + \bar{A}B \\ = \overline{\bar{A}B} \bar{C}$$

电路图



$$(4) Y_4(A,B,C,D) = \sum(m_0, m_2, m_3, m_{10}, m_{14}, m_{15}) \\ = \overline{BD} + ABC = \overline{\overline{BD}} \overline{ABC}$$

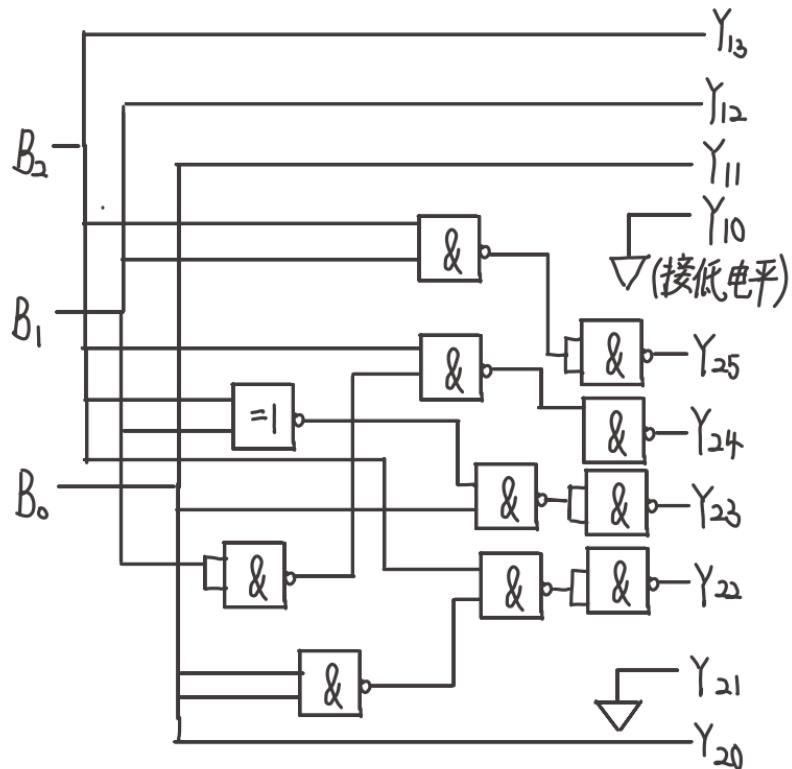


37 易得 Y_1 为 4 位 2 进制数, Y_2 为 6 位 2 进制数

真值表	B_2	B_1	B_0	Y_{13}	Y_{12}	Y_{11}	Y_{10}	Y_{25}	Y_{24}	Y_{23}	Y_{22}	Y_{21}	Y_{20}
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	1	0	0	1	0	0	0	0	0	0	1
	0	1	0	0	1	0	0	0	0	0	1	0	0
	0	1	1	0	1	1	0	0	0	1	0	0	1
	1	0	0	1	0	0	0	0	1	0	0	0	0
	1	0	1	1	0	1	0	0	1	1	0	0	1
	1	1	0	1	1	0	0	1	0	0	1	0	0
	1	1	1	1	1	1	0	1	1	0	0	0	1

易得 $Y_{10}=0$ $Y_{11}=B_0$ $Y_{12}=B_1$ $Y_{13}=B_2$

$$Y_{20}=B_0 \quad Y_{21}=0 \quad Y_{22}=\overline{B_0}B_1 \quad Y_{23}=\overline{B_2}B_1B_0 + B_2\overline{B_1}B_0 \quad Y_{24}=B_2\overline{B_1} + B_2B_0 \quad Y_{25}=B_2B_1$$



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真值表

A	B	C	M	N
0	0	0	0	0
0	0	1	1	1
0	1	0	1	0
0	1	1	0	0
1	0	0	1	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

电路图

