预习报告.

实验 1.

8421 转 余3 码.

设输入位为 A, B, C, D ; 输出位 E_3, E_2, E_1, E_0

画出真值表

A	B	C	D	E_3	E_2	E_1	E_0
0	0	0	0	0	0	1	1
0	0	0	1	0	1	0	0
0	0	1	0	0	1	0	1
0	0	1	1	0	1	1	0
0	1	0	0	0	1	1	1
0	1	0	1	1	0	0	0
0	1	1	0	1	0	0	1
0	1	1	1	1	0	1	0
1	0	0	0	1	0	1	1
1	0	0	1	1	1	0	0

余下输入都是非法输入，无需考虑真值变化.

由卡诺图和观察得：

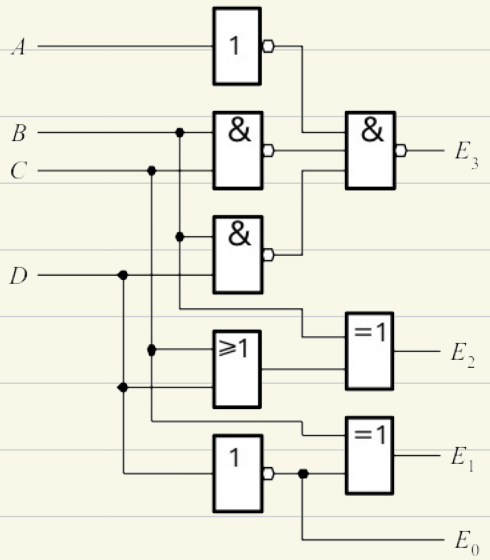
$E_0 = \overline{D}$

$E_1 = \overline{C \oplus D}$

$E_2 = B \oplus (C + D)$

$E_3 = \overline{\overline{A} \cdot \overline{BC} \cdot \overline{BD}}$

设计电路.



实验2.

2421 → gray

I_1	I_2	I_3	I_4	十进制值.	gray G_1	G_2	G_3	G_4
2	4	2	1					
0	0	0	0	0	0	0	0	0
0	0	0	1	1	0	0	0	1
0	0	1	0	2	0	0	1	1
0	0	1	1	3	0	0	1	0
0	1	0	0	4	0	1	1	0
0	1	0	1	5	0	1	1	1
0	1	1	0	6	0	1	0	1
0	1	1	1	7	0	1	0	0
1	0	0	0	2	0	0	1	1
1	0	0	1	3	0	0	1	0
1	0	1	0	4	0	1	1	0
1	0	1	1	5	0	1	1	1
1	1	0	0	6	0	1	0	1
1	1	0	1	7	0	1	0	0
1	1	1	0	8	1	1	0	0
1	1	1	1	9	1	1	0	1

$G_1 = I_1 \times I_2 \times I_3$

$G_2 = I_1 \times \overline{I_3} + I_2$

$G_3 = \overline{I_1}\,\overline{I_2} I_3 + \overline{I}\, I_2 \overline{I_3} + I_1 \overline{I_2}$

$G_4 = I_1 \overline{I_3}\,\overline{I_4} + \overline{I_1}\,\overline{I_3} I_4 + I_2 I_3 I_4 + \overline{I_1}\,\overline{I_2} I_3 \overline{I_4}$

G_3

	00	01	11	10
00	0	1	0	1
01	0	1	0	1
11	1	0	0	1
10	1	0	0	1

G_4

	00	01	11	10
00	0	0	1	1
01	1	1	0	0
11	0	1	1	1
10	1	0	0	0

$$G_3 = \bar{I}_1 \bar{I}_2 I_3 + \bar{I}_1 I_2 \bar{I}_3 + I_1 \bar{I}_2$$

$$G_4 = I_1 \bar{I}_3 \bar{I}_4 + \bar{I}_1 \bar{I}_3 I_4 + I_2 I_3 I_4 + I_1 I_3 I_4 + \bar{I}_1 \bar{I}_2 I_3 I_4$$