

- truth table for the Circuit A outputs

Decimal	V2	V1	V0	A2	A1	A0
	0	0	x	d	d	d
10	0	1	0	0	0	0
11	0	1	1	0	0	1
12	1	0	0	0	1	0
13	1	0	1	0	1	1
14	1	1	0	1	0	0
15	1	1	1	1	0	1

- minimal Boolean logic expressions

Kmap for A₀

V ₂ \ V ₀ V ₁	00	01	11	10
0	d		1	d
1			1	1

$$A_0 = V_0$$

Kmap for A₁

V ₂ \ V ₀ V ₁	00	01	11	10
0	d			d
1	1			1

$$A_1 = \overline{V_1}$$

Kmap for A₂

V ₂ \ V ₀ V ₁	00	01	11	10
0	d			d
1		1	1	

$$A_2 = V_1 \cdot V_2$$

- the logic function z

Binary value	Decimal digits	
0000	0	0
0001	0	1
0010	0	2
...
1001	0	9
1010	1	0
1011	1	1
1100	1	2
1101	1	3
1110	1	4
1111	1	5

		V_0V_1			
V_2V_3		00	01	11	10
	00	0	0	0	0
	01	0	1	1	0
	11	1	1	1	1
	10	0	0	0	0

$$Z = V_1 \cdot V_3 + V_2 \cdot V_3$$

- the logic expressions for each segment

z	HEX0(0)	HEX0(1)	HEX0(2)	HEX0(3)	HEX0(4)	HEX0(5)	HEX0(6)
0	0	0	0	0	0	0	1
1	1	0	0	1	1	1	1

$\text{HEX0}(0) = z$
 $\text{HEX0}(1) = '0'$
 $\text{HEX0}(2) = '0'$
 $\text{HEX0}(3) = z$
 $\text{HEX0}(4) = z$
 $\text{HEX0}(5) = z$
 $\text{HEX0}(6) = '1'$