

بسم الله الرحمن الرحيم

Logic Design Project

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Design

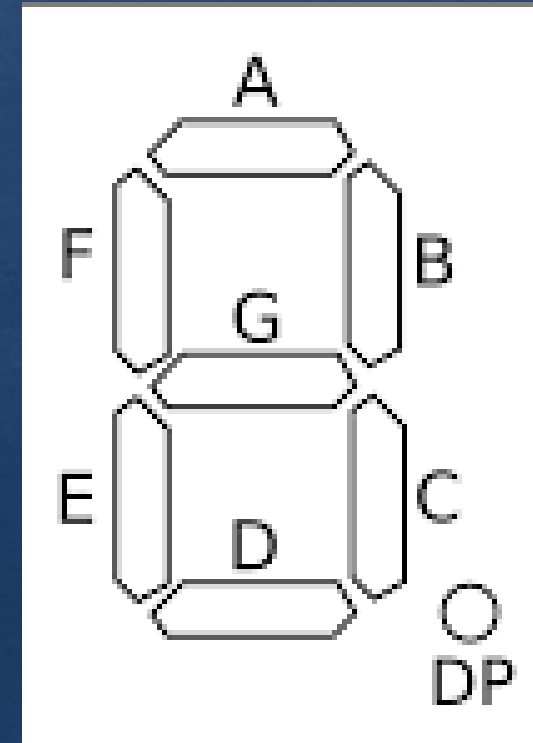
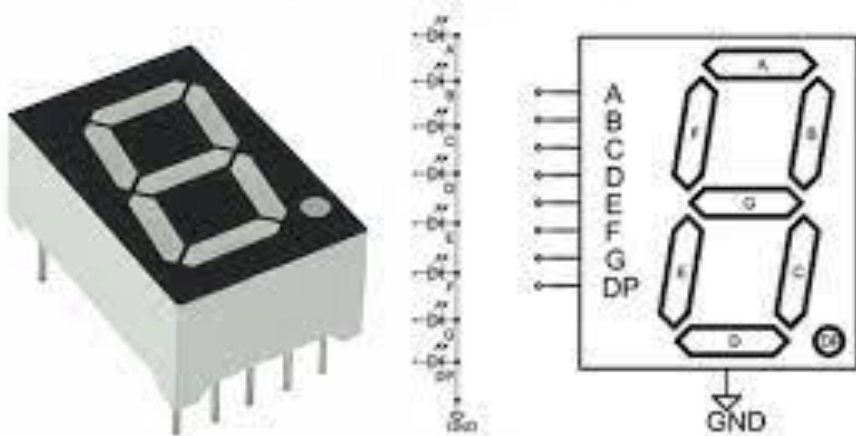
Logic Design Project_Design

In this project you are required to design and implement a digital system that controls three seven-segment displays to show the acronyms ASU, FOE, CSE, and FUN. This system will switch between these displays sequentially with a one second interval between them

- 00: ASU
- 01: FOE
- 10: CSE
- 11: FUN


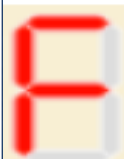


ASU FOE CSE FUN

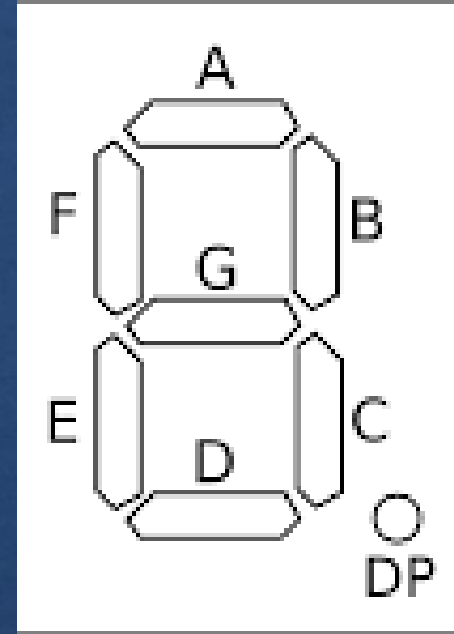
7-Segment Display



Logic Design Project_Design

1st 7-Segment

	x	y	a	b	c	d	e	f	g
	0	0	1	1	1	0	1	1	1
	0	1	1	0	0	0	1	1	0
	1	0	1	0	0	1	1	1	1
	1	1	1	0	0	0	1	1	0



$$a=e=f=1$$

$$b=c=x'.y'$$

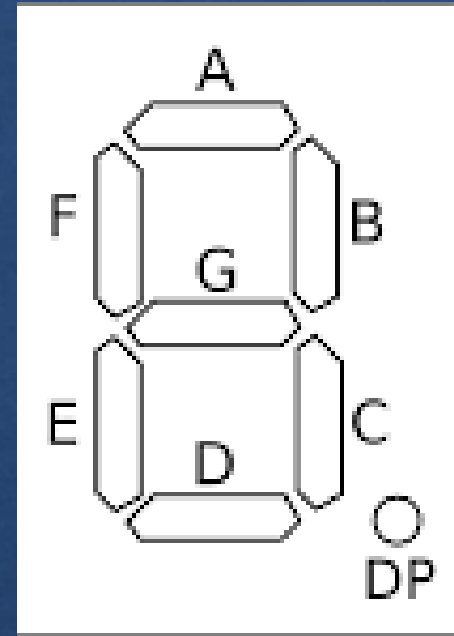
$$d=x.y'$$

$$g=(x.y')'=d'$$

Logic Design Project_Design

2nd 7-Segment

	x	y	a	b	c	d	e	f	g
5	0	0	1	0	1	1	0	1	1
0	0	1	1	1	1	1	1	1	0
9	1	0	1	0	1	1	0	1	1
4	1	1	0	1	1	1	1	1	0



$$a=(x.y)'$$

$$h=e=v$$

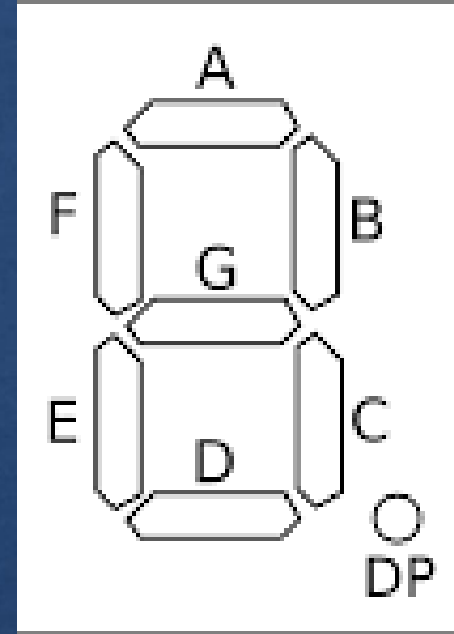
$$f=c=d=1$$

$$g=y'=b'$$

Logic Design Project_Design

3rd 7-Segment

	x	y	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	0
1	0	1	1	0	0	1	1	1	1
2	1	0	1	0	0	1	1	1	1
3	1	1	1	1	1	0	1	1	0



$$a=(x'.y')'$$

$$c=b=(x'.y'+x.y)'=((x'.y')'.(x.y)')'$$

$$d=(x.y)'$$

$$e=f=1$$

$$g=b'$$

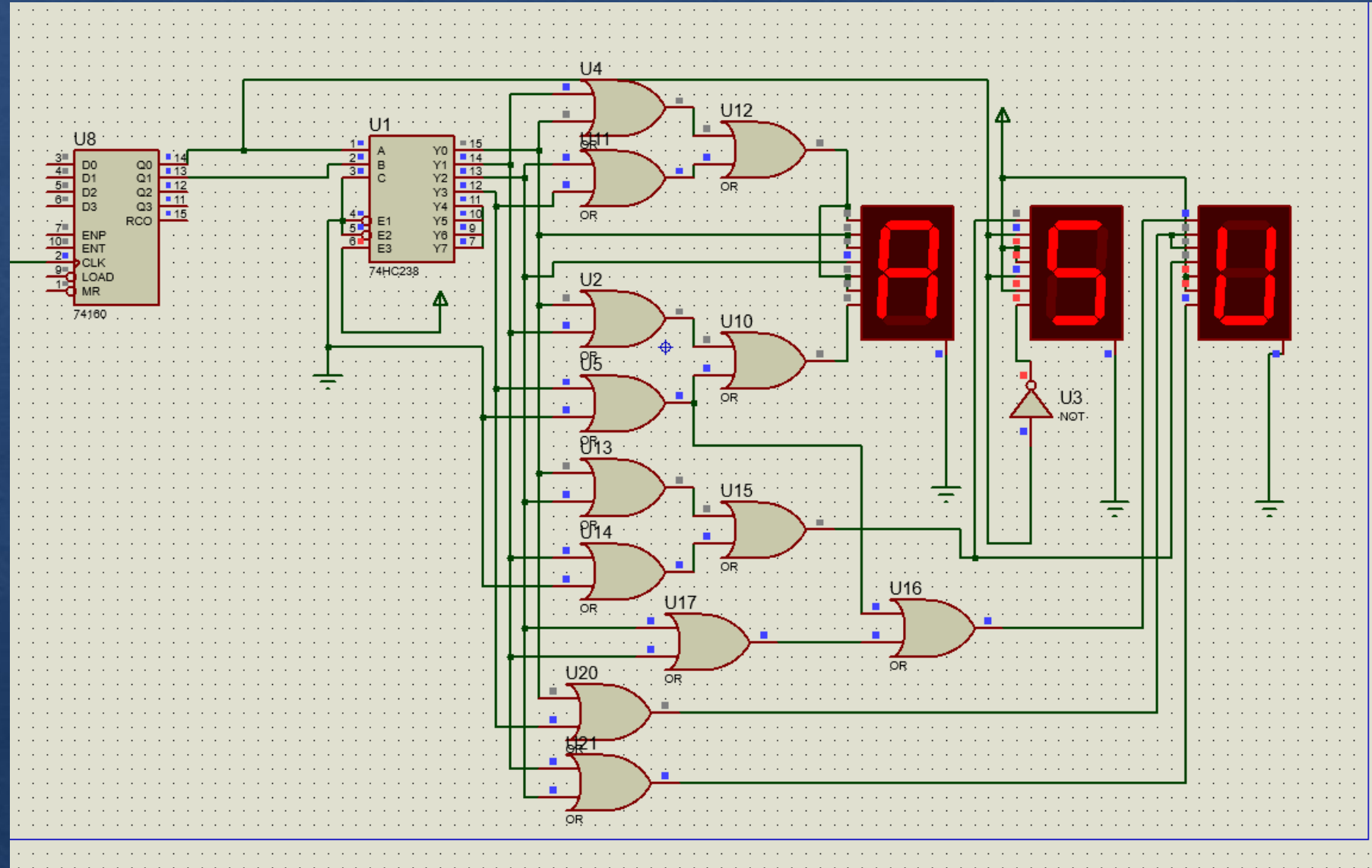
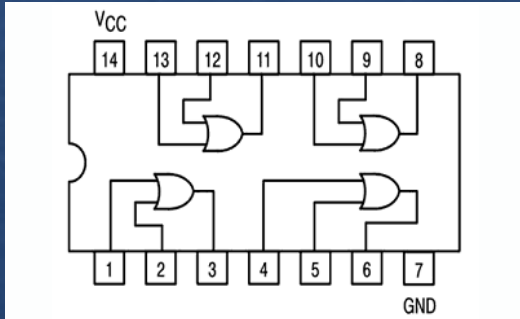
To minimize
the number
of ICs



Implementation

Design_1 if we use decoder

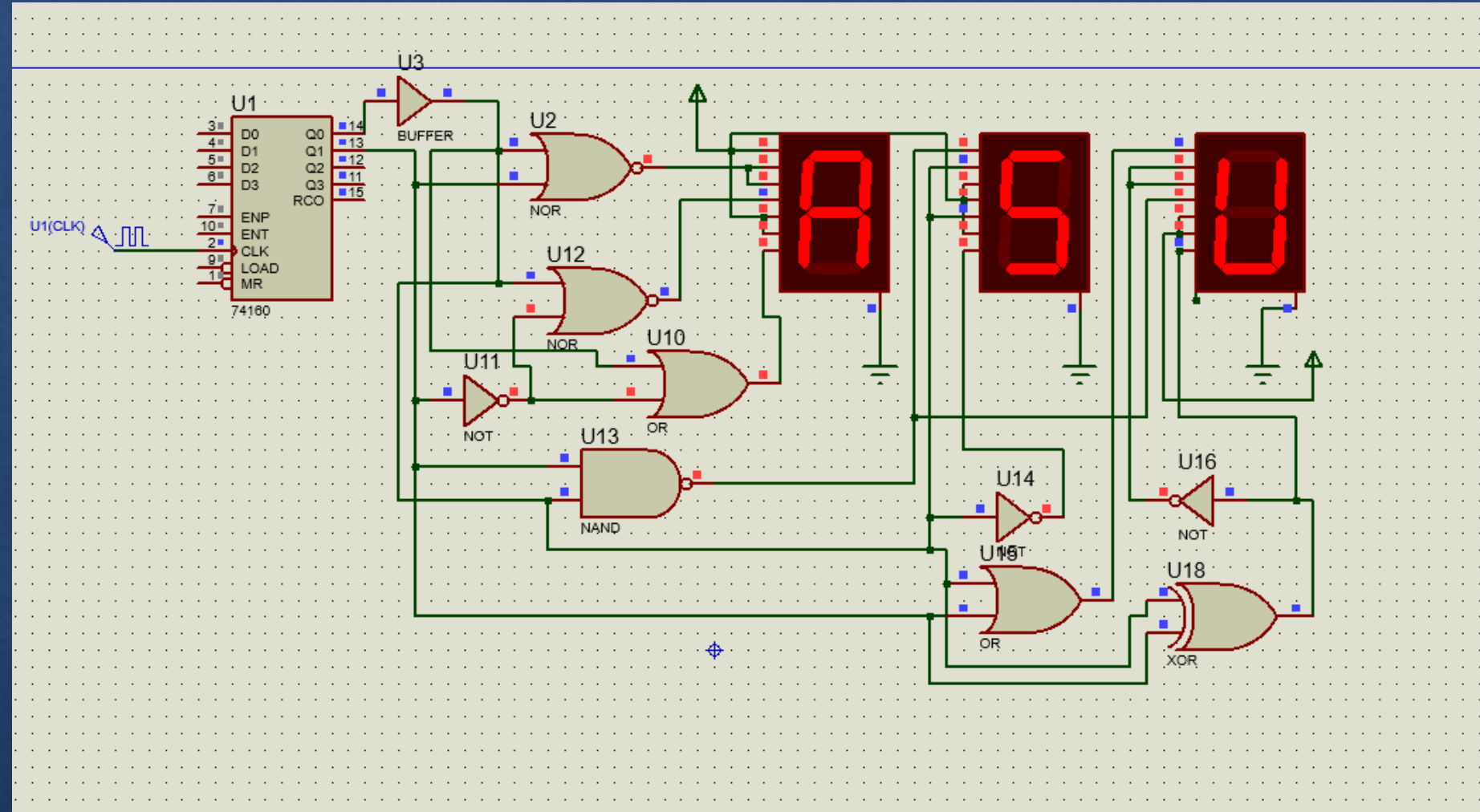
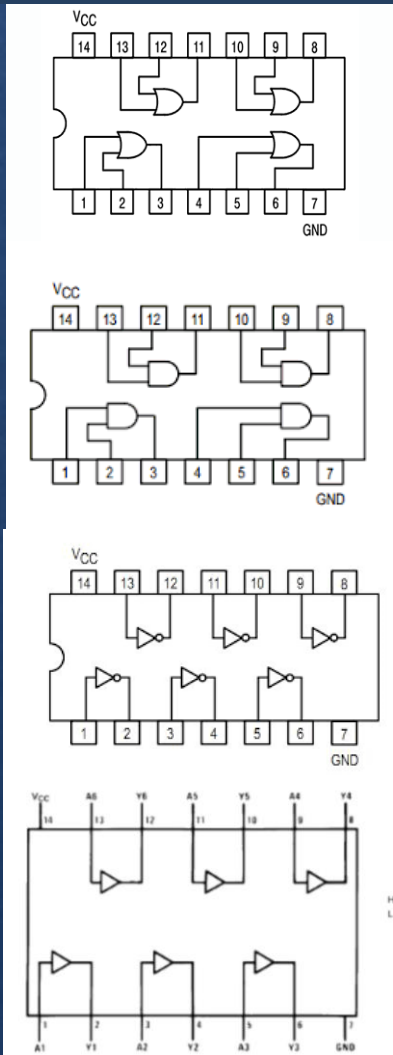
13 OR gate = 5 ICs



Design_2

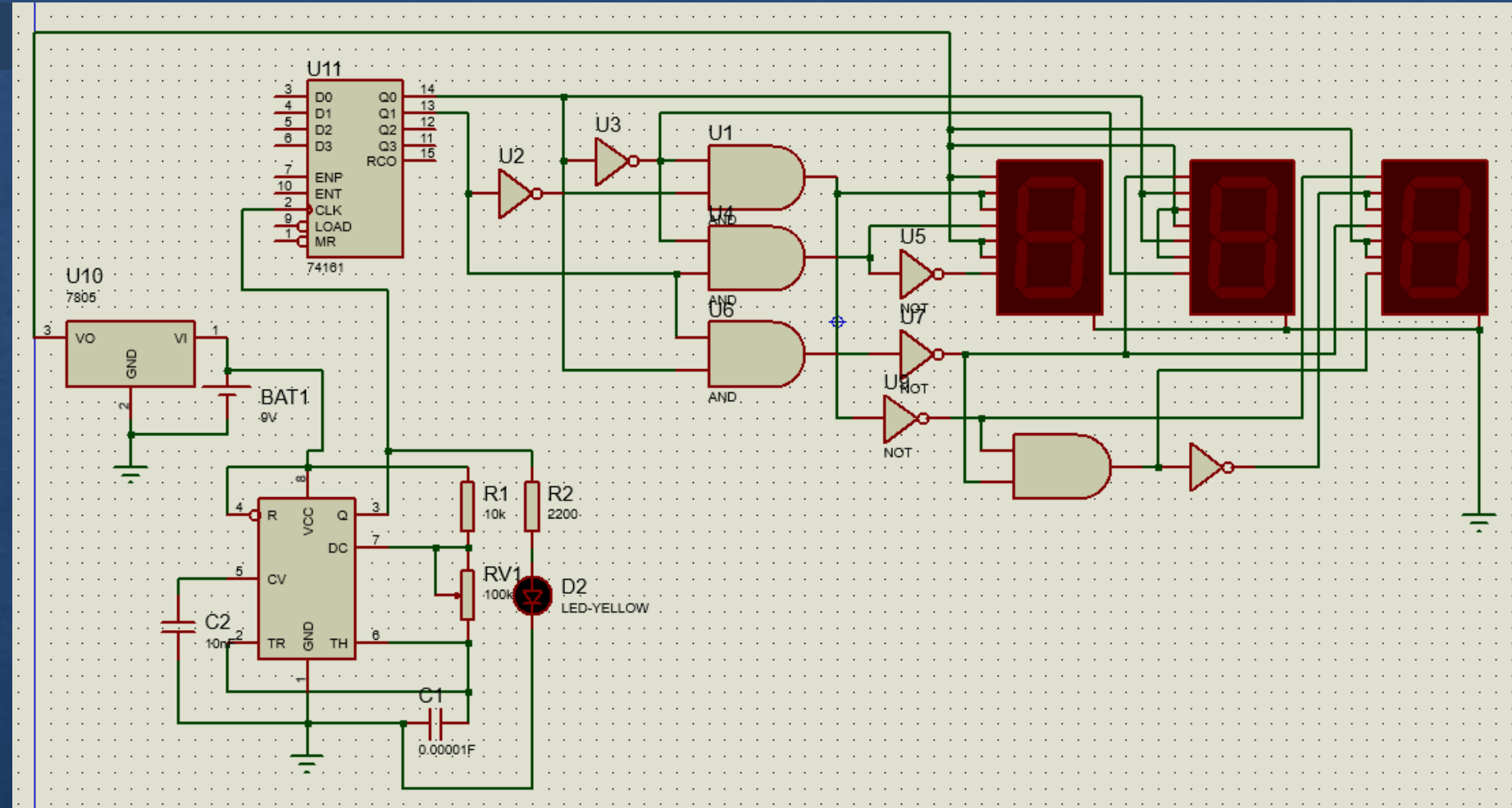
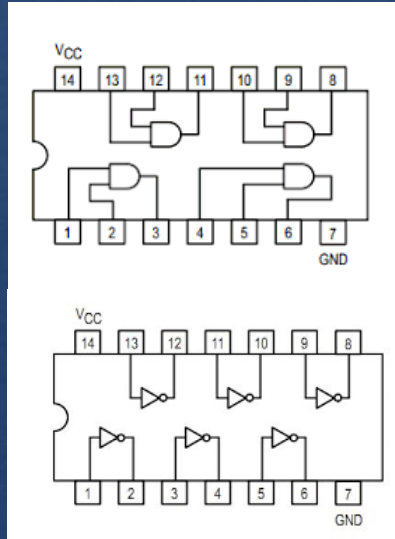
3 OR + 3NOT +1XOR +1

Buffer =4 ICs

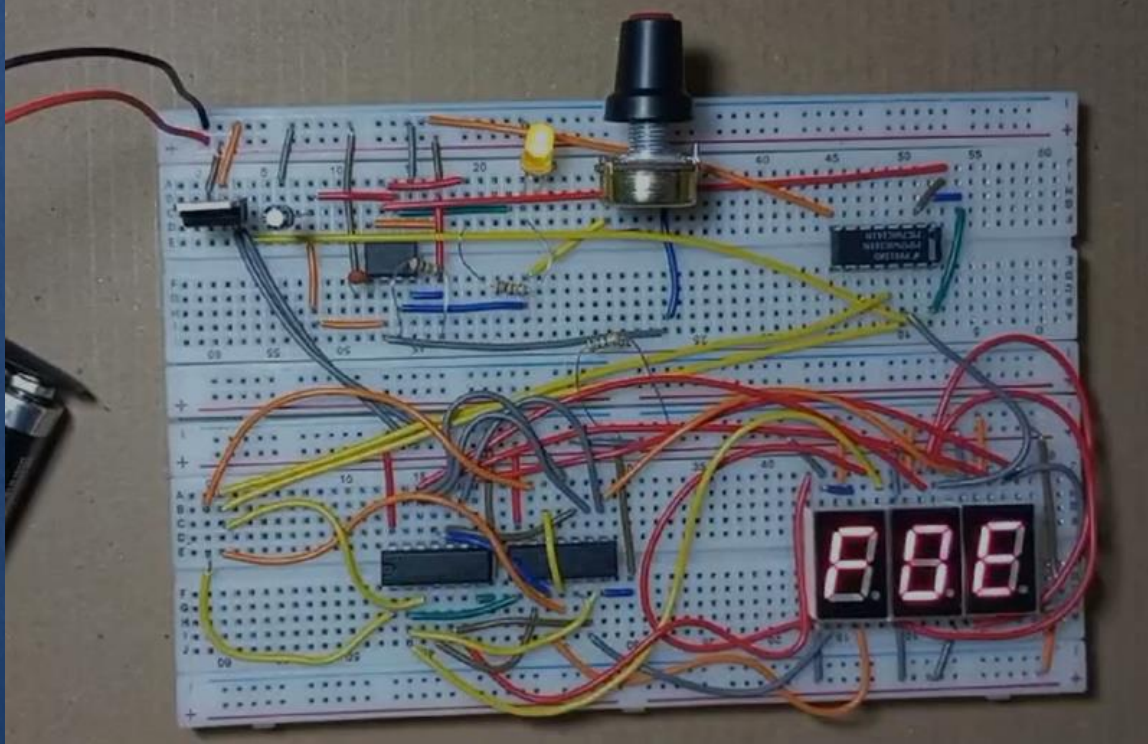


The best Design

6 Not + 4 AND = 2IC only



The best Design



Cost \$\$

0,9934
0,2111
0,6633
0,5455
0,6433

0,6663
0,6360
0,7305
0,5014
0,1724

0,7902
0,4813
0,8062

Cost

Product	quantity	Amount
IC 7408 – Quad 2 (AND)	1	10.00
IC 7404 – Quad 2 (NOT)	1	10.00
NE555N	1	6.50
IC 74161 – (counter_4-bit)	1	18.00
7 Segment 0.5 Common cathode	3	18.00
7805 (regulator)	2	10.00
Bread Board	2	70.00
Jumper wires	1	35.00
Mixed resistance	5	1.00
Mixed capacitors	4	1.50
Mixed Leds	4	2.00
500 K Potentiometer	1	4.50
9v Battery + clip	1	87.5
cover	1	16
Total		290.00