NORTH SOUTH UNIVERSITY

Department of Electrical & Computer Engineering

Project Report

Group-6

Project Name: Seven Segment Display(**c.ForcES**)

Section: CSE231L.05

Faculty: SMMA

Semester: Spring-24

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Project Name & Description:

A seven-segment display is a type of electronic display device used to represent decimal numerals and, in some cases, alphanumeric characters, using a set of seven segments arranged in a rectangular fashion. Each segment can be individually activated or deactivated to display different numbers and characters.

Among the group members, we found the cheapest segment, "**c.FOrcES**", which is implemented using nor gate and implemented by *Alif Bin Turjo*, one of our group members. We implemented the word using a seven-segment display as our project using the following component.

Truth-Table:

	Input			Output							
Character	w	x	y	a	b	c	d	e	f	g	dp
c	0	0	0	0	0	0	1	1	0	1	0
.	0	0	1	0	0	0	0	0	0	0	1
F	0	1	0	1	0	0	0	1	1	1	0
O	0	1	1	1	1	1	1	1	1	0	0
r	1	0	0	0	0	0	0	1	0	1	0
c	1	0	1	0	0	0	1	1	0	1	0
E	1	1	0	1	0	0	1	1	1	1	0
S	1	1	1	1	0	1	1	0	1	1	0

Using the table & K-Map:-

a

w/xy	00	01	11	10
0	0	0		
1	0	0		

b

w/xy	00	01	11	10
0	0	0		0
1	0	0	0	0

c

w/xy	00	01	11	10
0	0	0		0
1	0	0		0

d

w/xy	00	01	11	10
0		0		0
1	0			

e

w/xy	00	01	11	10
0		0		
1			0	

f

w/xy	00	01	11	10
0	0	0		
1	0	0		

g

w/xy	00	01	11	10
0		0	0	
1				

dp

w/xy	00	01	11	10
0	0		0	0
1	0	0	0	0

POS:

a = x

b = xw'y

c = xy
d = (w'+x+y)(w+x+y')(w+x'+y)

e = (w+x+y')(w'+x'+y')

f = x

g = w+y'

dp = w'x'y

And using the POS we implemented NOR:

a = (x)''
a = x''

b = (xw'y)''
b = (x'+w+y')'

c = (xy)''
c = (x'+y')'

d = ((w'+x+y)(w+x+y')(w+x'+y))''
d = ((w'+x+y)'+(w+x+y')'+(w+x'+y)')'

e = ((w+x+y')(w'+x'+y'))''
e = ((w+x+y')'+(w'+x'+y')')'

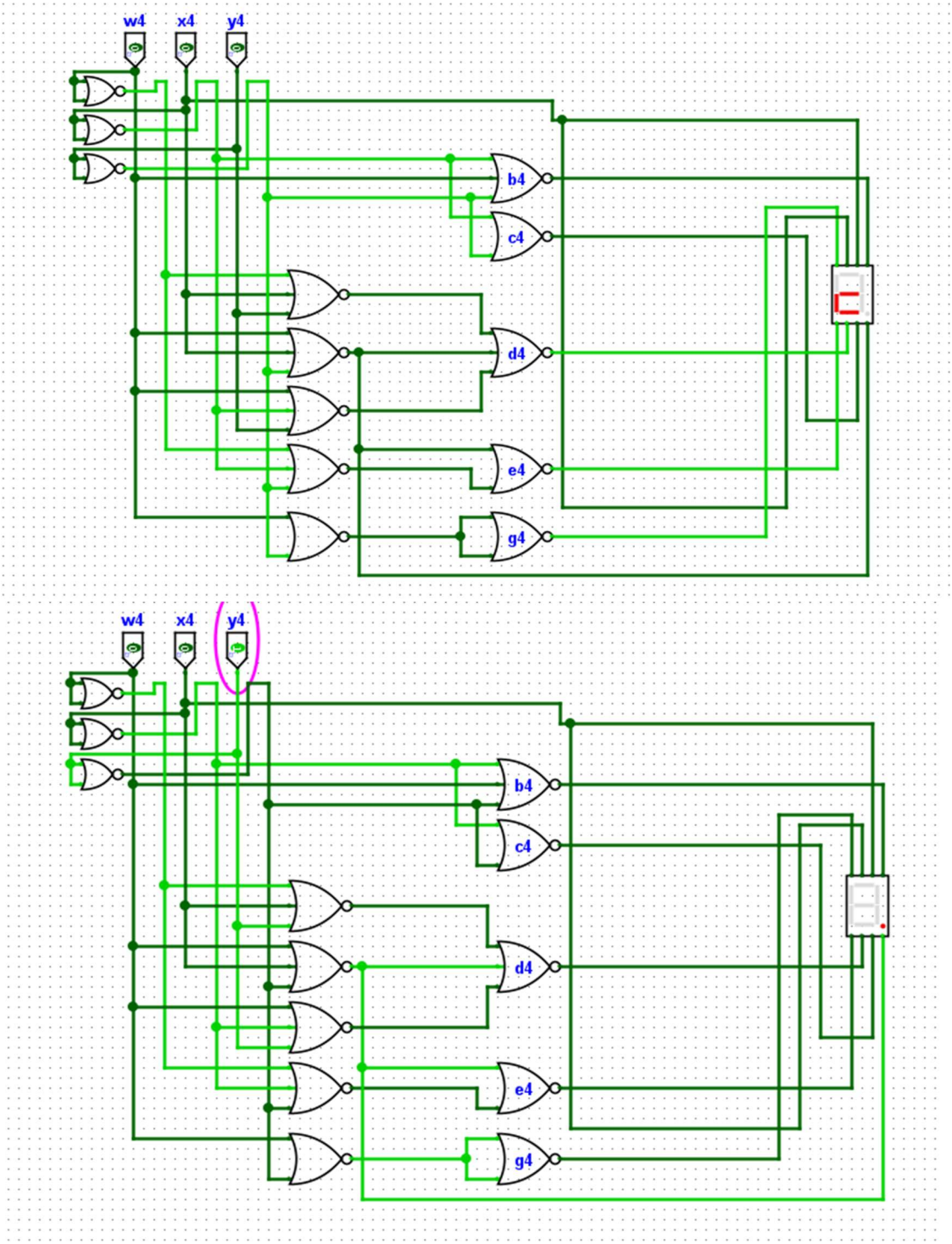
f = (x)''
f = x''

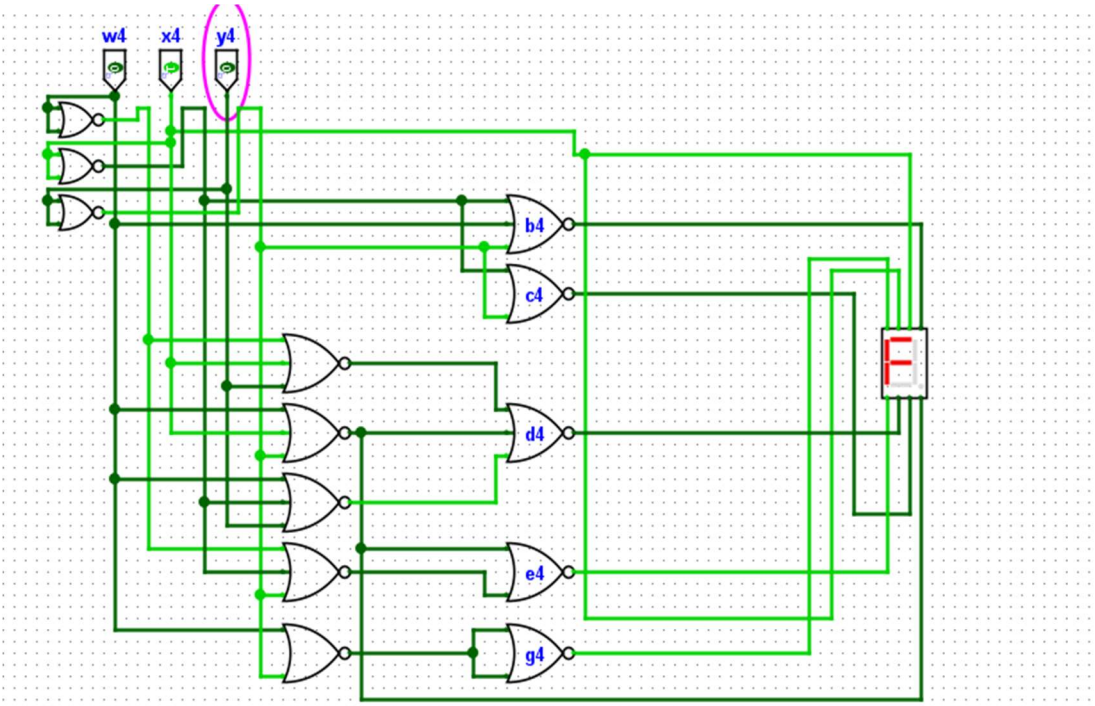
g = (w+y')''
g = (w+y')''

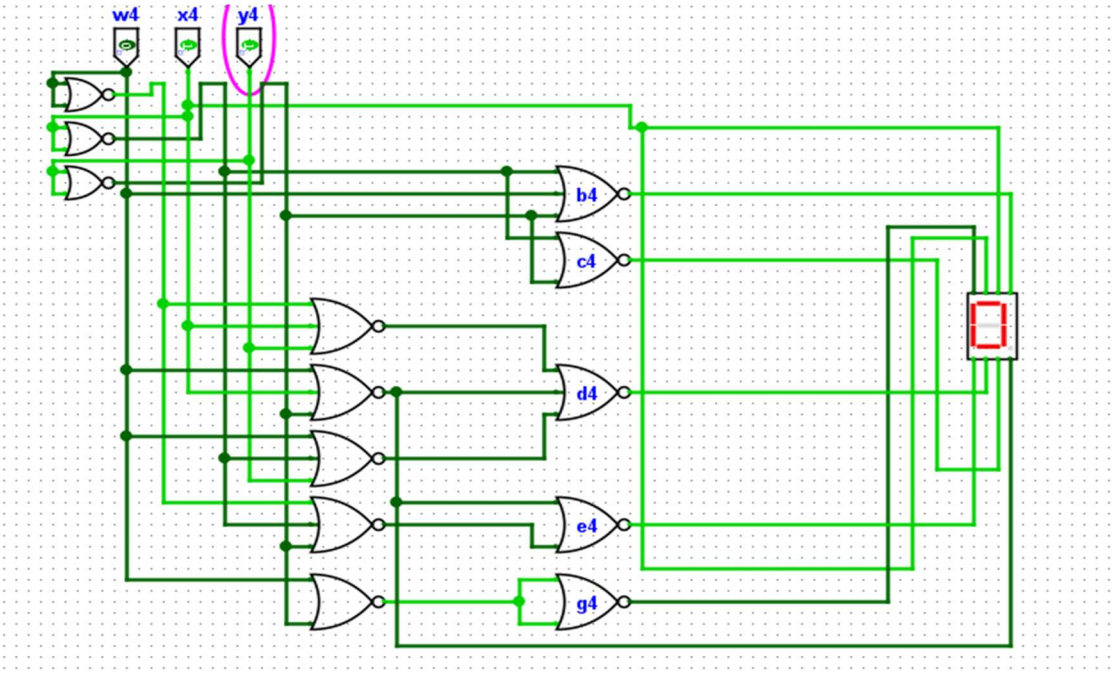
dp = (w'x'y)''
dp = (y'+w+x)'

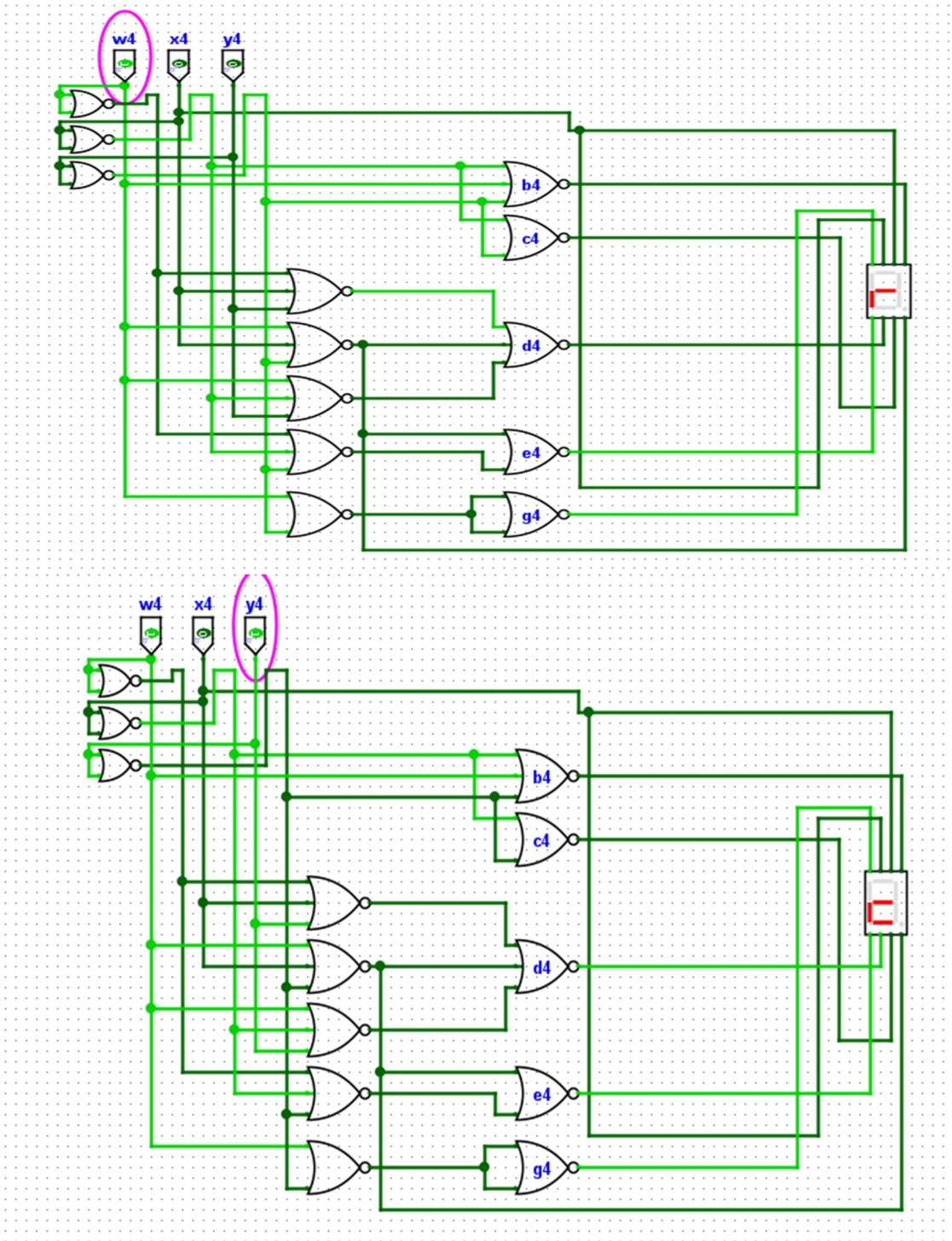
Circuit Diagram

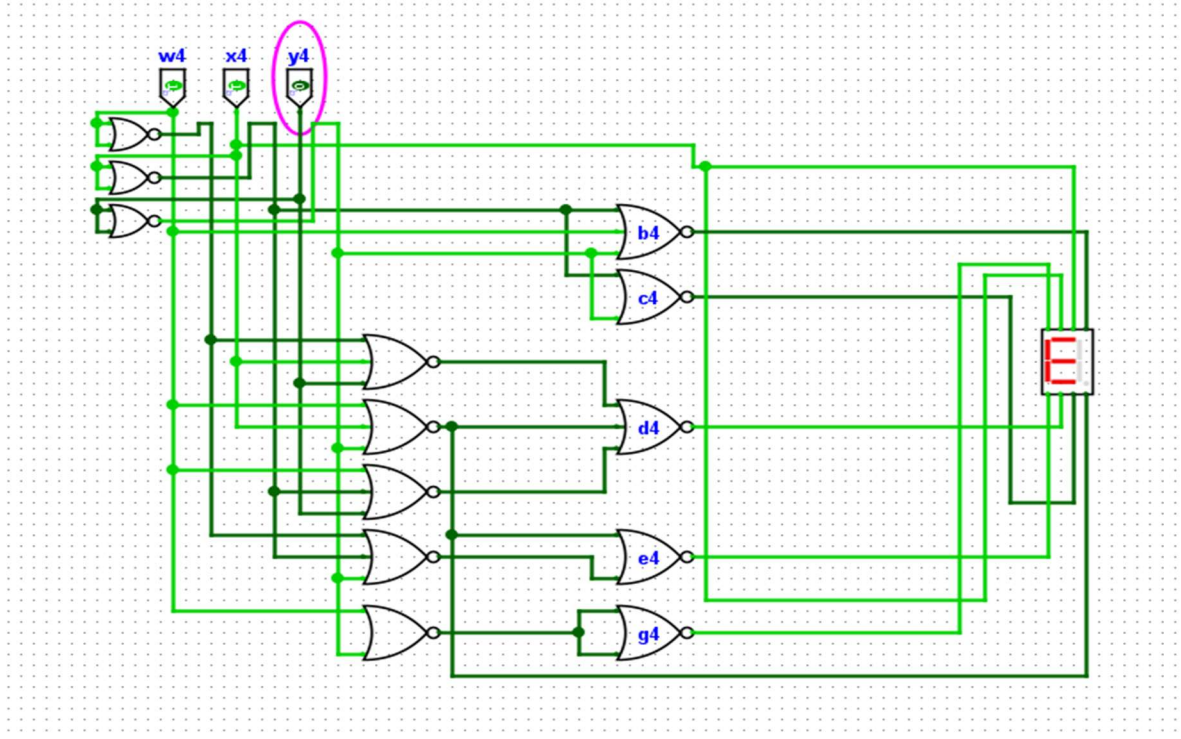
Using the Logisim implementation using gate:

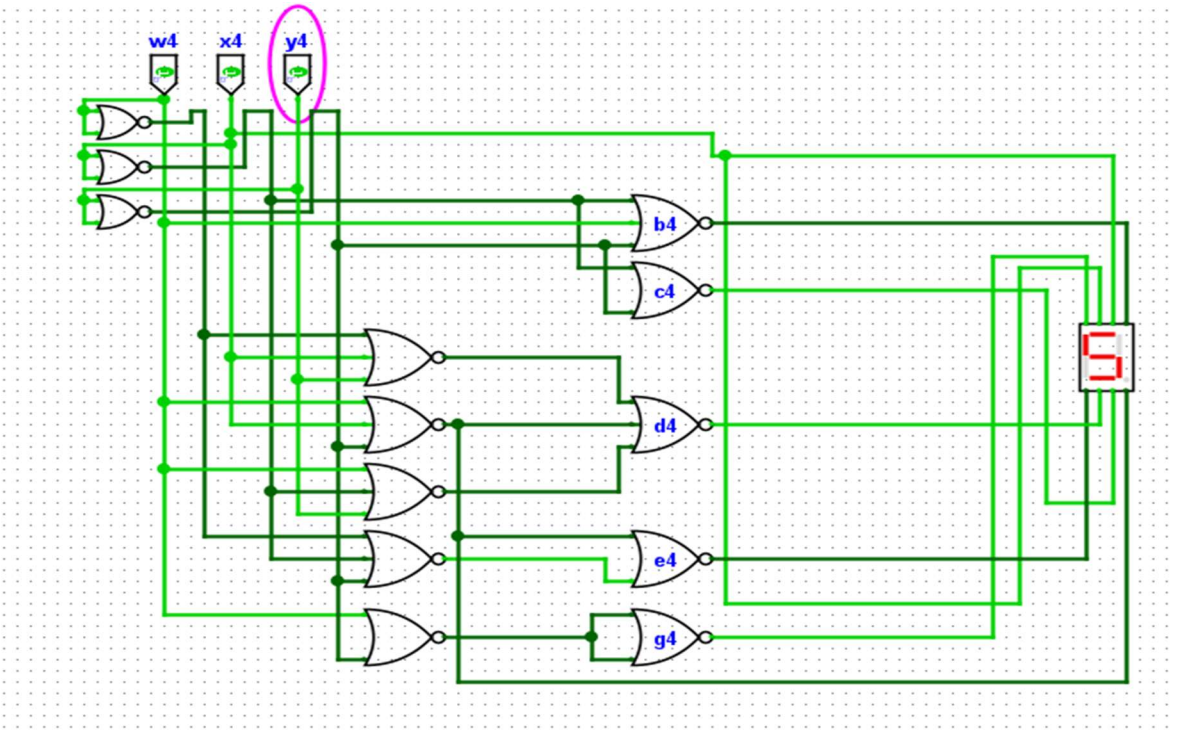



w4
x4
y4
b4
c4
d4
e4
g4

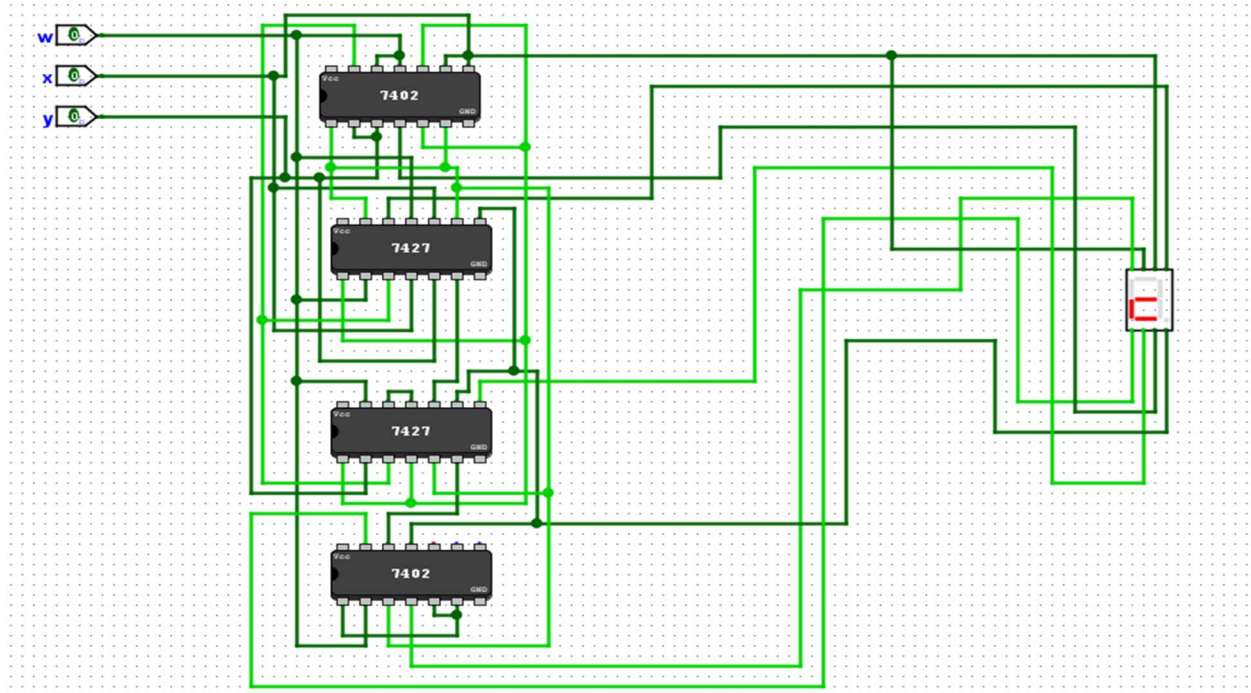

w4
x4
y4
b4
c4
d4
e4
g4

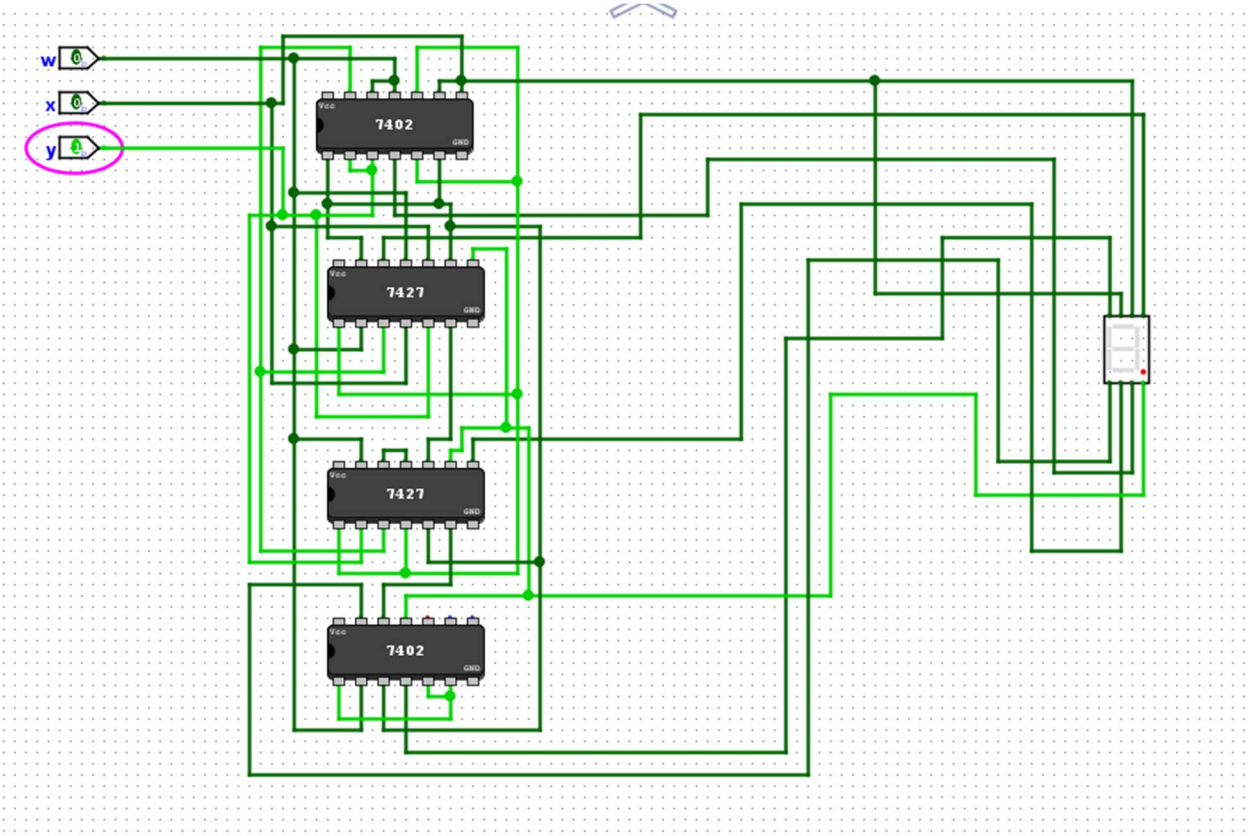

w4
x4
y4
b4
c4
d4
e4
g4
w4
x4
y4
b4
c4
d4
e4
g4

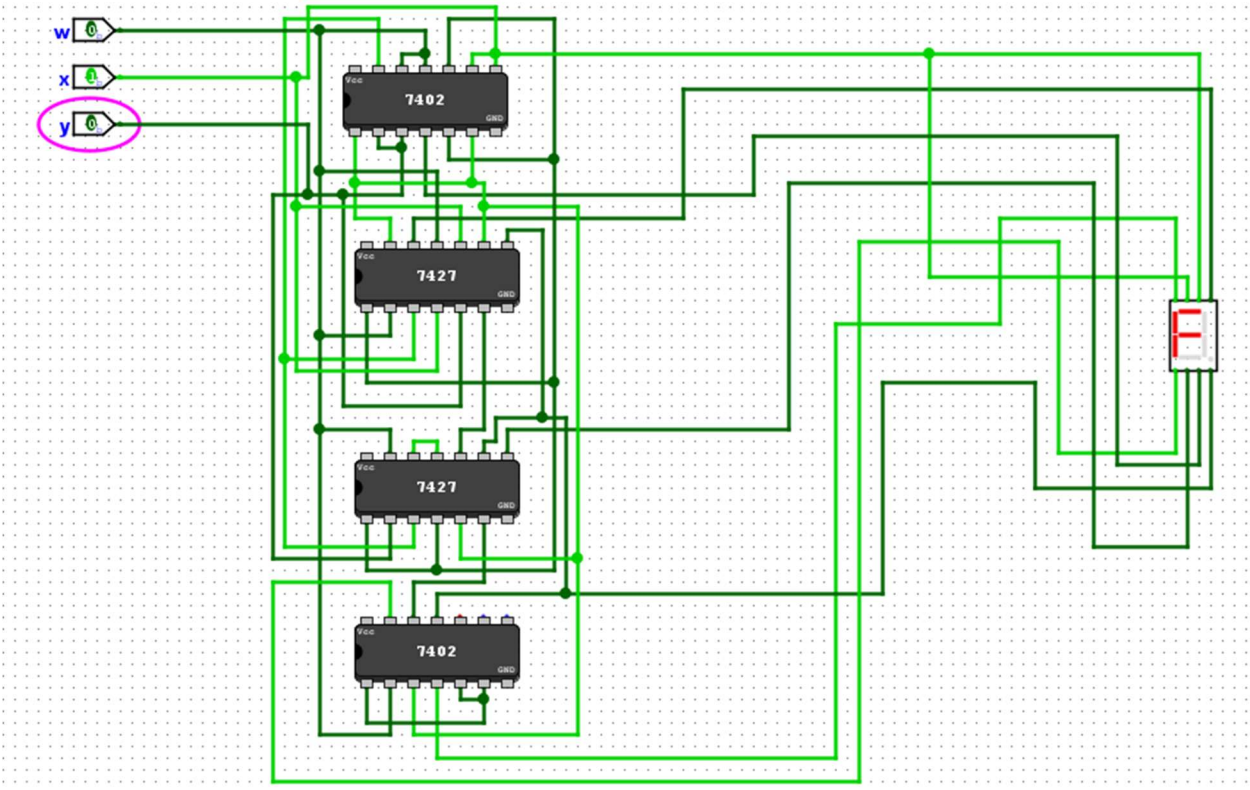

w4
x4
y4
b4
c4
d4
e4
g4

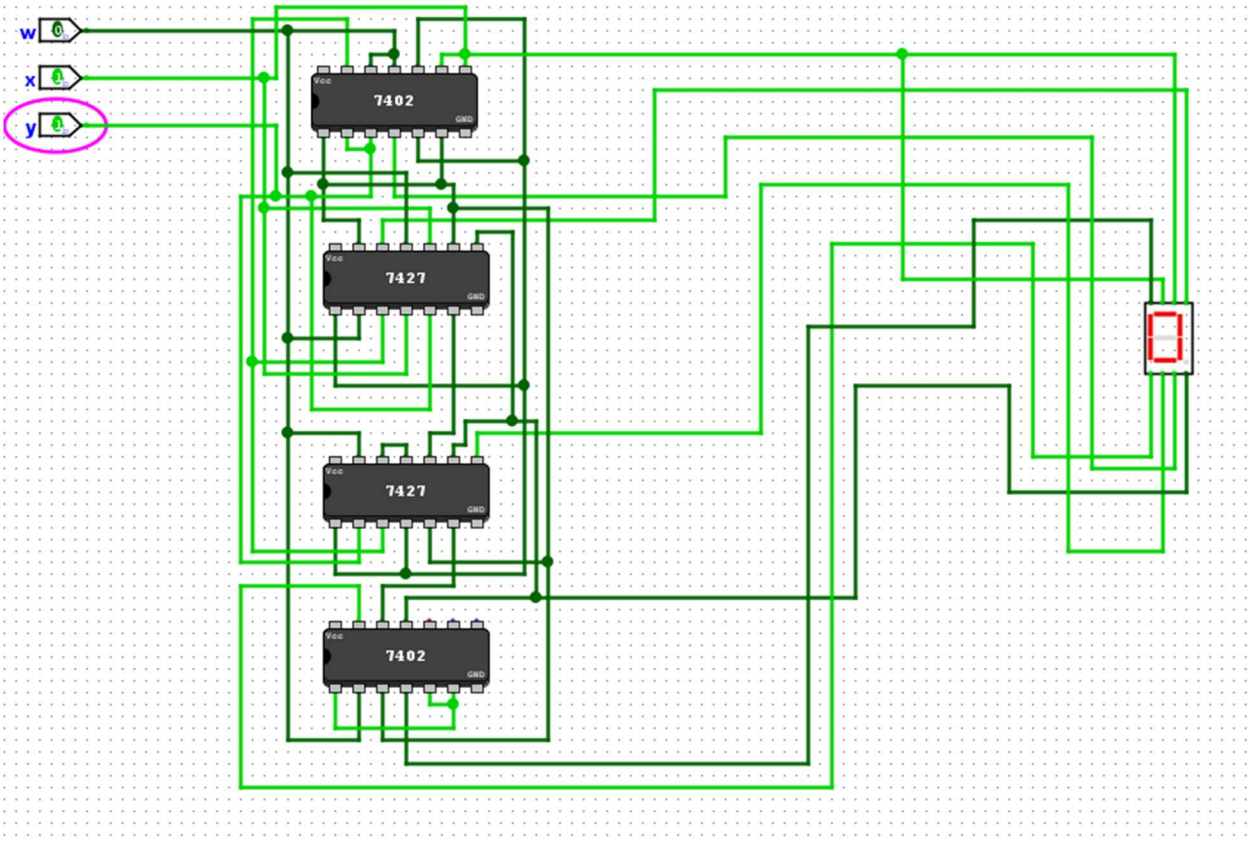

w4
x4
y4
b4
c4
d4
e4
g4

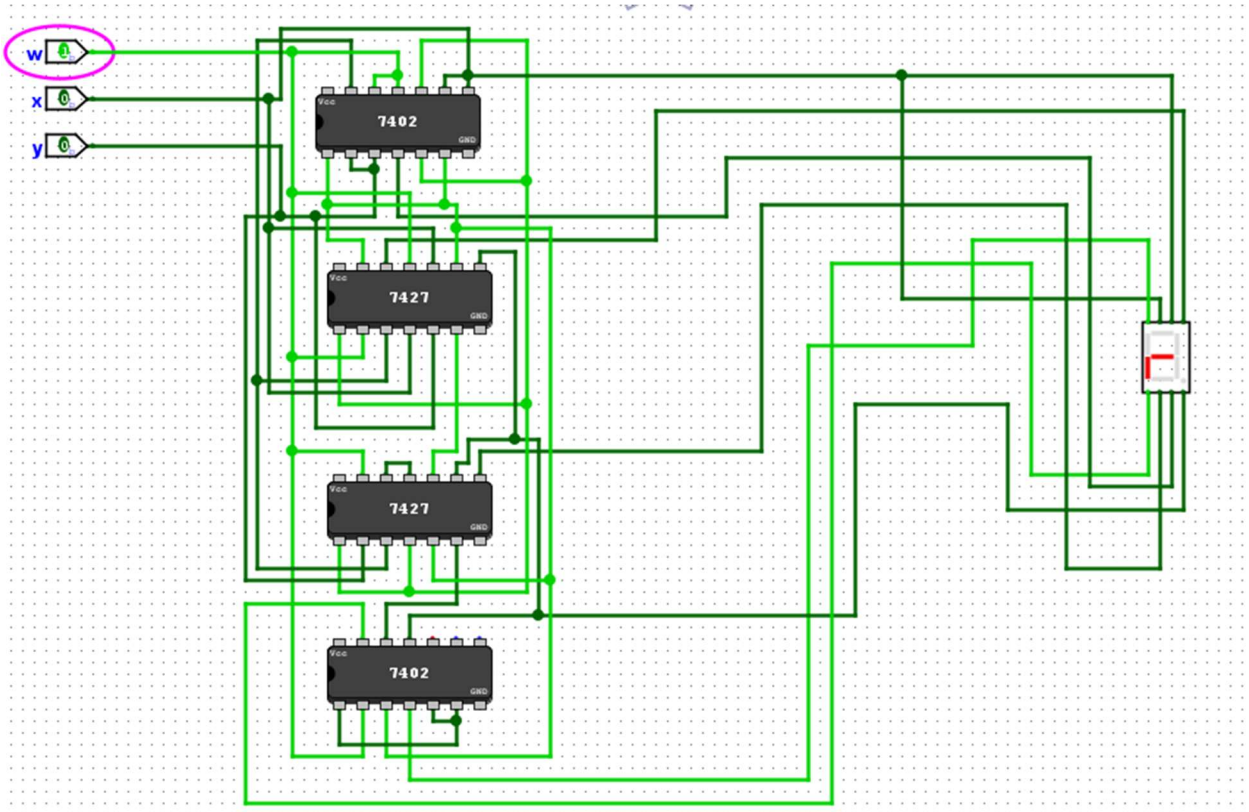
Logisim Implementations Using TTL:

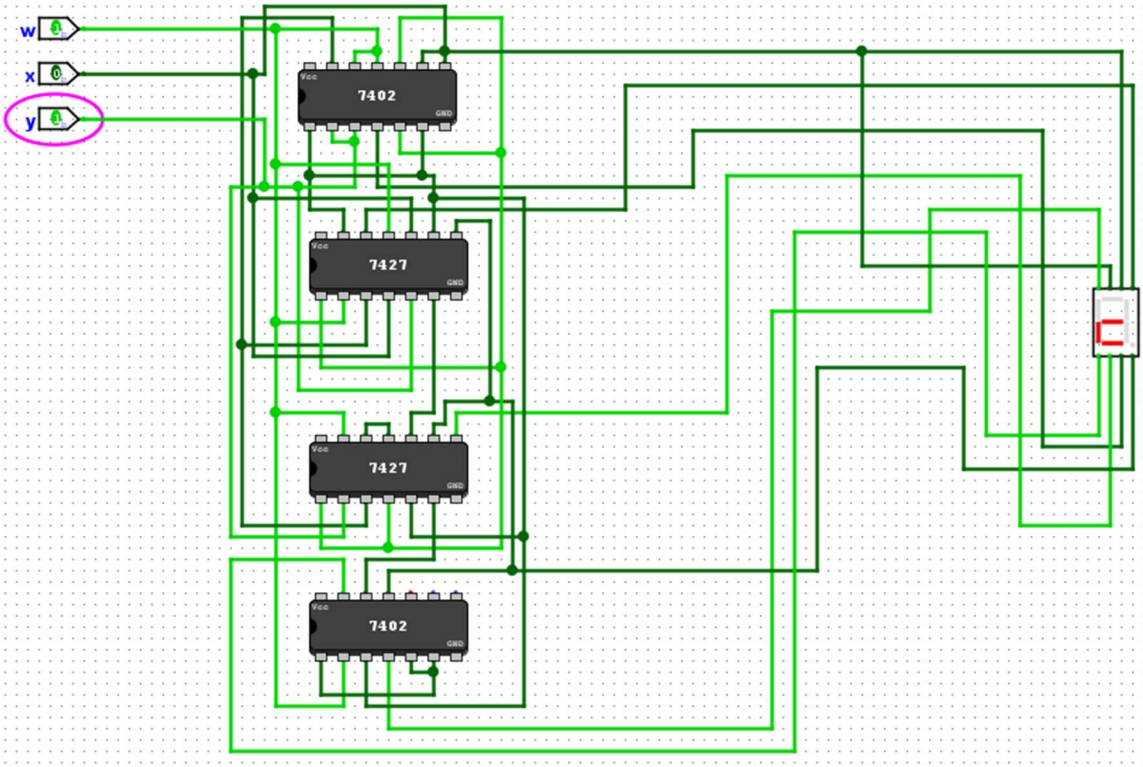


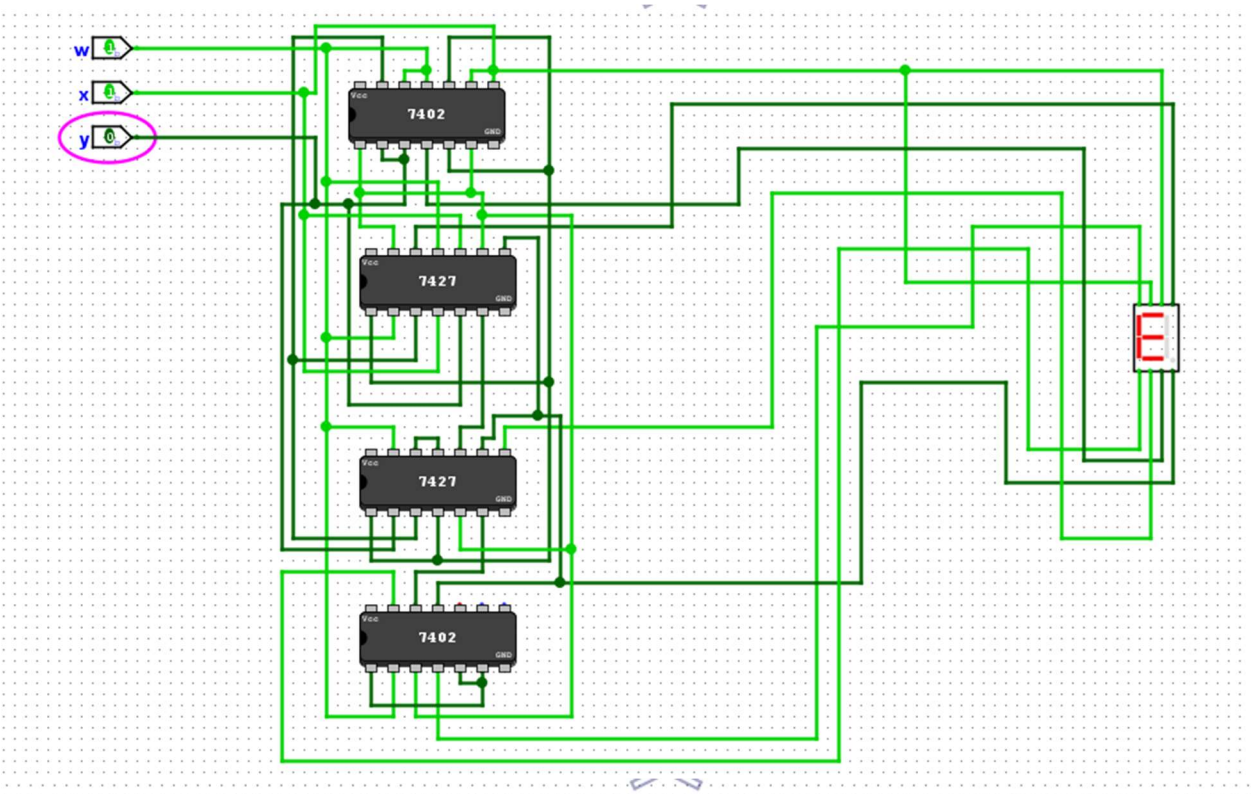


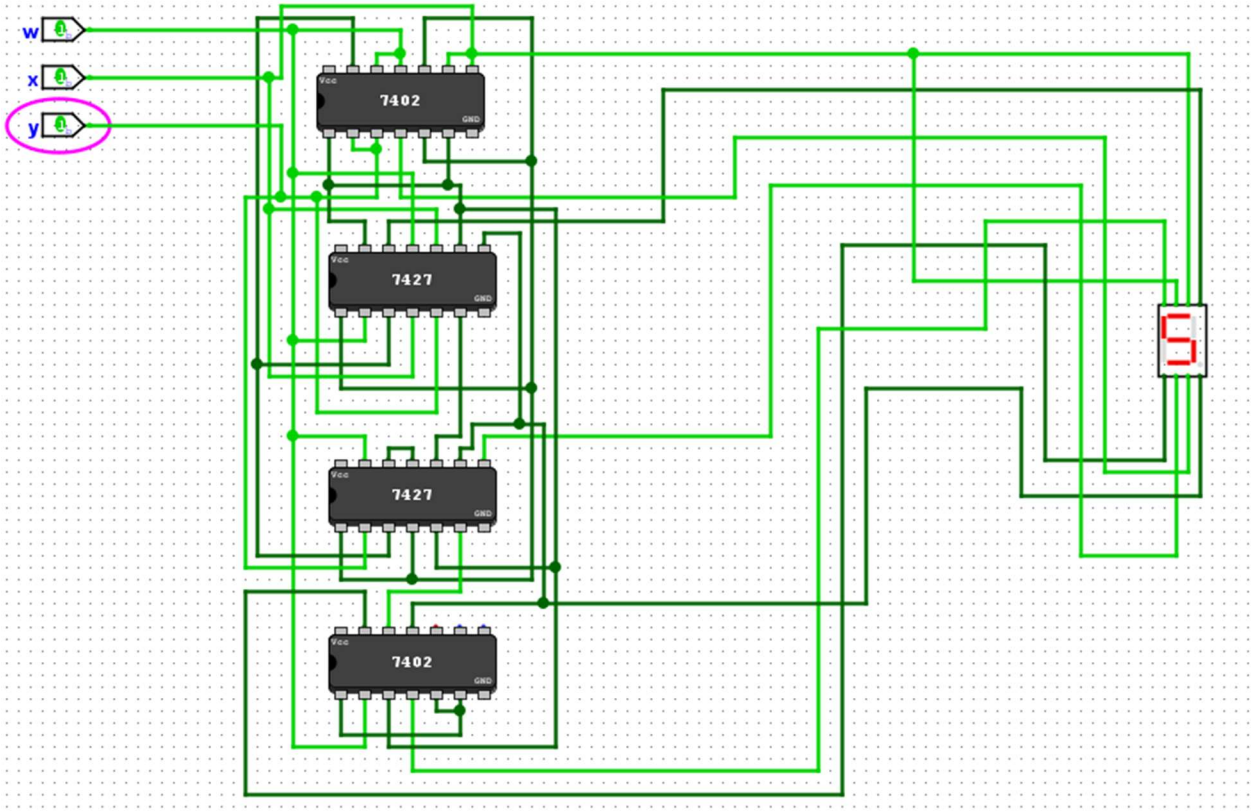

w
x
y
7402
7427
7427
7402


w
x
y
7402
7427
7427
7402


w
x
y
7402
7427
7427
7402


w
x
y
7402
7427
7427
7402


w
x
y
7402
7427
7427
7402


w
x
y
7402
7427
7427
7402

Requirement & Cost analysis:

By using the Logisim we found the cost analysis for NOR gate.

2 input NOR gate :7pcs(2 **IC7402**)(25tk)
3 input NOR gate: 6(2 **IC7427)(**35tk)
Total:120/=

Component	Quantity	Price
7402:Quad 2-input NOR Gate	2	25x2=50/=
7427:Triple 3-input NOR Gate	2	35x2=70/=
Breadboard	2	310/=
Battery (9V)	1	84/=
L7805 Voltage Regulator (5V)	1	13/=
Jumper Wires	40	100/=
Resistor (1kΩ)	5	5/=
Seven Segment Display	1	15/=
	Total	**647/=**

Discussion:

In our group project, we are trying to get an output using a seven-segment display. To get the output, we implement a truth table and solve some equations like the Sum of midterm, Product of maxterm, POS, and SOP; we also use Decoder, MUX and finally, NAND using SOP & NOR using POS. After implementing all these things, we analyze our cost analysis. After implementing the cost analysis, we found the cheapest one from one of our group members who used the NOR gate to implement the output as the cheapest one. For that, we used 2 and 3 inputs for the gate breadboard and the other things and successfully implemented the final circuit.