

# Hw02

## Question 1

$$\text{maxfloat} = (1 + 1 - (1/2)^{23}) \times 2^{254-127}$$

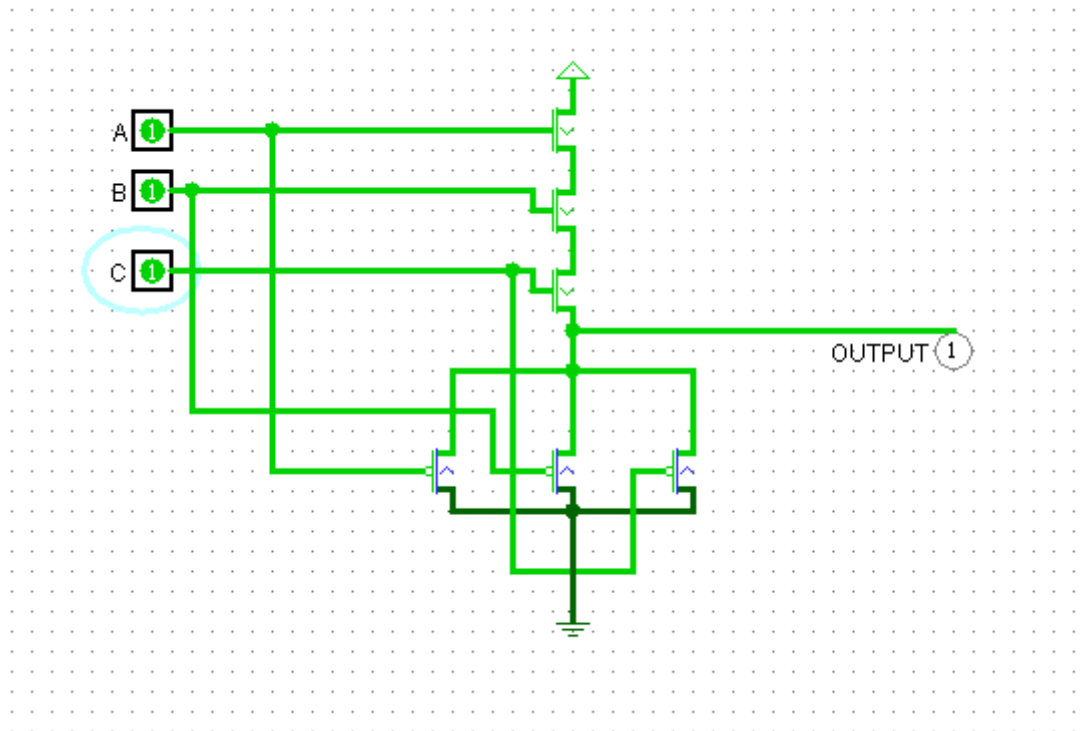
## Question 2

$$2^{31} - 1$$

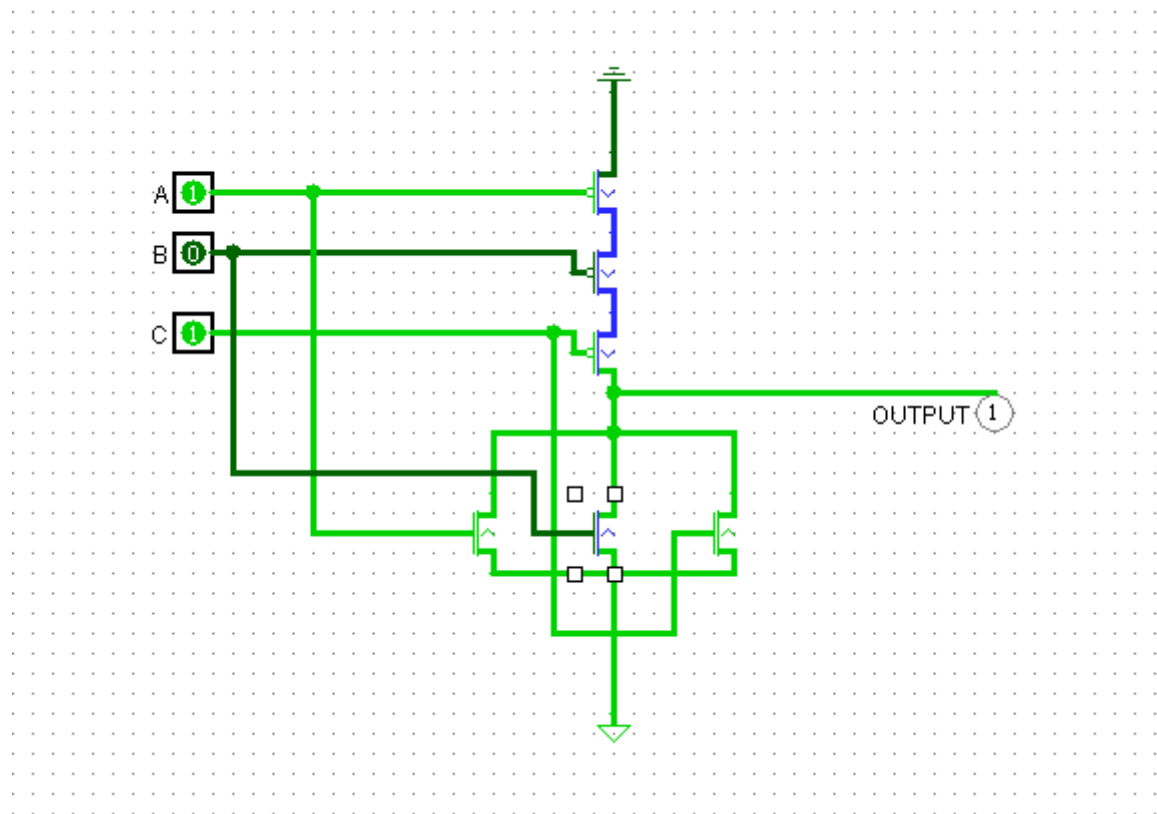
## Question 3

a

AND gate



OR Gate



**b**

AND Gate

对应第一题，上面三个三极管，从上到下，分别为通，不通，不通

下面三个三极管，从左到右，分别为不通，通，通

OR gate

上面三个门，对应从上到下，分别是不通，通，通，下面三个门，从左到右，分别是通，不通，不通

## Question 4

- a) x
- b) 1
- c) 0
- d) X
- e) 0

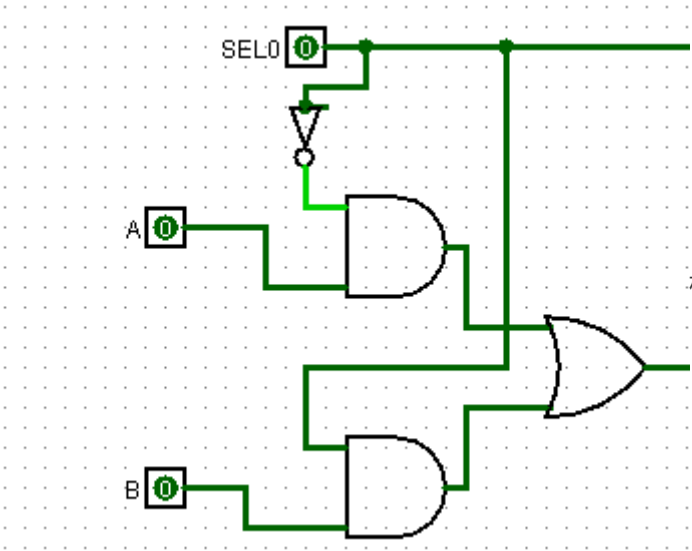
## Question 5

Circuit 1 When  $A=0$ , then  $D=c$  else  $A=1$ , then  $D=B$

Circuit 2 When  $A=0$ , then  $D=1$  else  $A=1$ , then  $D=B$

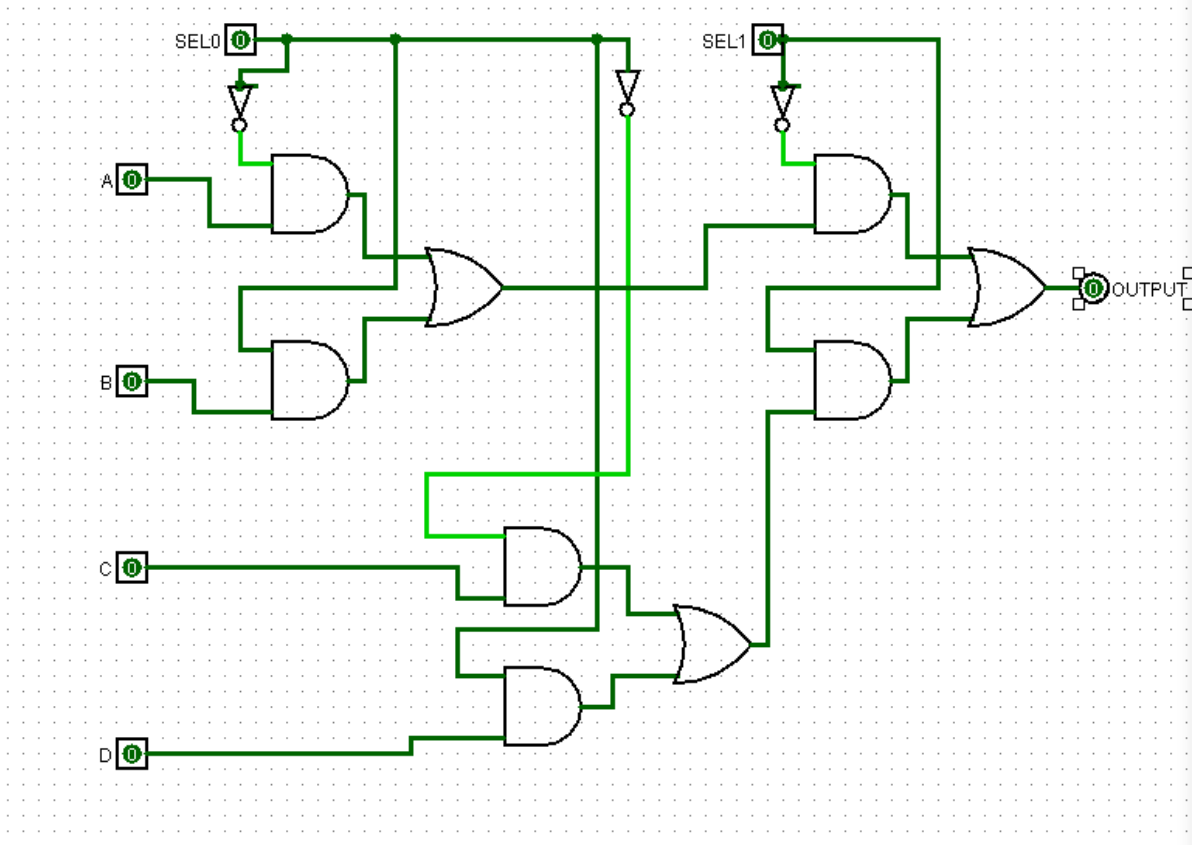
## Question 6

(1)二选一多路选择器



构建四选一多路选择

器



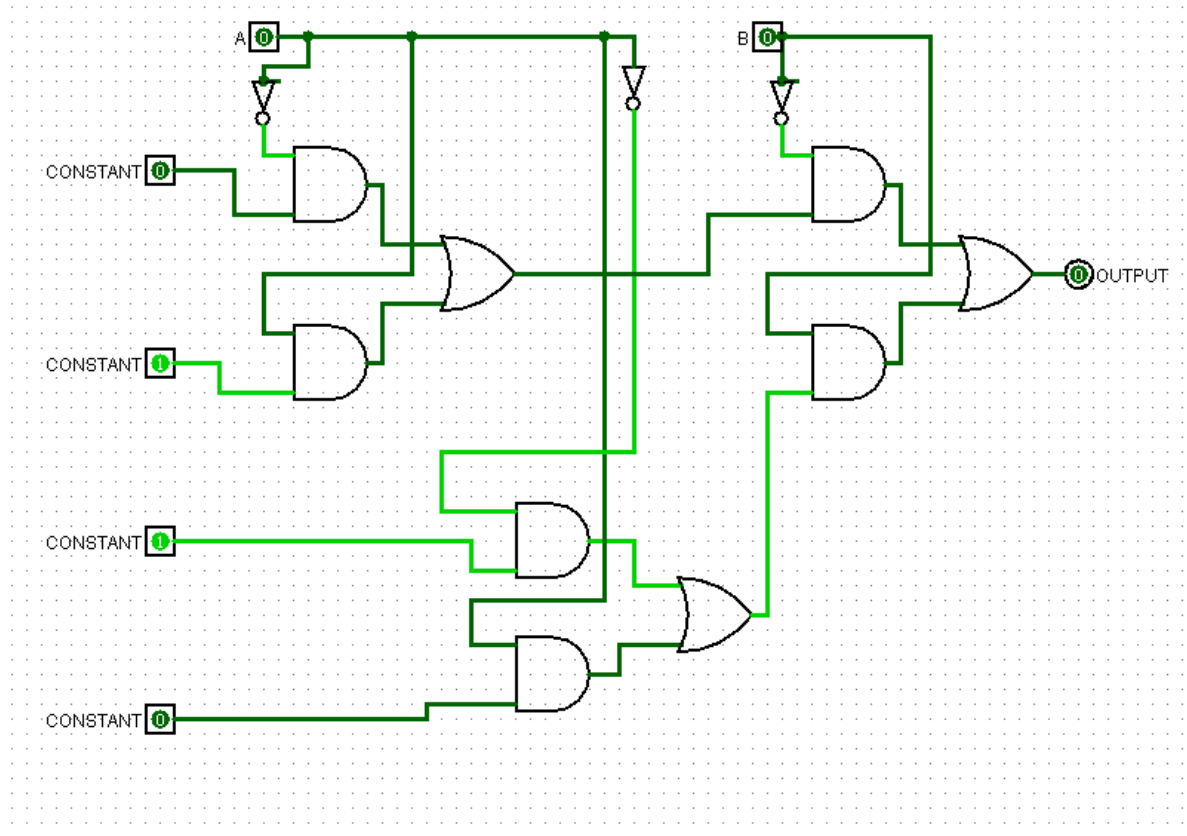
Table

S1	S0	A	B	C	D	out
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	1	0	0
0	0	0	0	1	1	0
0	0	0	1	0	0	0
0	0	0	1	0	1	0
0	0	0	1	1	0	0
0	0	0	1	1	1	0
0	0	1	0	0	0	1
0	0	1	0	0	1	1
0	0	1	0	1	0	1
0	0	1	0	1	1	1
0	0	1	1	0	0	1
0	0	1	1	0	1	1
0	0	1	1	1	0	1
0	0	1	1	1	1	1
0	1	0	0	0	0	0
0	1	0	0	0	1	0
0	1	0	0	1	0	0
0	1	0	0	1	1	0
0	1	0	1	0	0	1
0	1	0	1	0	1	1
0	1	0	1	1	0	1
0	1	0	1	1	1	1
0	1	1	0	0	0	0
0	1	1	0	0	1	0
0	1	1	0	1	0	0
0	1	1	0	1	1	0
0	1	1	1	0	0	1
0	1	1	1	0	1	1

S1	S0	A	B	C	D	out
0	1	1	1	1	0	1
0	1	1	1	1	1	1
1	0	0	0	0	0	0
1	0	0	0	0	1	0
1	0	0	0	1	0	1
1	0	0	0	1	1	1
1	0	0	1	0	0	0
1	0	0	1	0	1	0
1	0	0	1	1	0	1
1	0	0	1	1	1	1
1	0	1	0	0	0	0
1	0	1	0	0	1	0
1	0	1	0	1	0	1
1	0	1	0	1	1	1
1	0	1	1	0	0	0
1	0	1	1	0	1	0
1	0	1	1	1	0	1
1	0	1	1	1	1	1
1	1	0	0	0	0	0
1	1	0	0	0	1	0
1	1	0	0	1	0	1
1	1	0	0	1	1	1
1	1	0	1	0	0	0
1	1	0	1	0	1	1
1	1	0	1	1	0	0
1	1	0	1	1	1	1
1	1	1	0	0	0	0
1	1	1	0	0	1	1
1	1	1	0	1	0	0
1	1	1	0	1	1	1

S1	S0	A	B	C	D	out
1	1	1	1	0	0	0
1	1	1	1	0	1	1
1	1	1	1	1	0	0
1	1	1	1	1	1	1

(2)用到了多路选择器



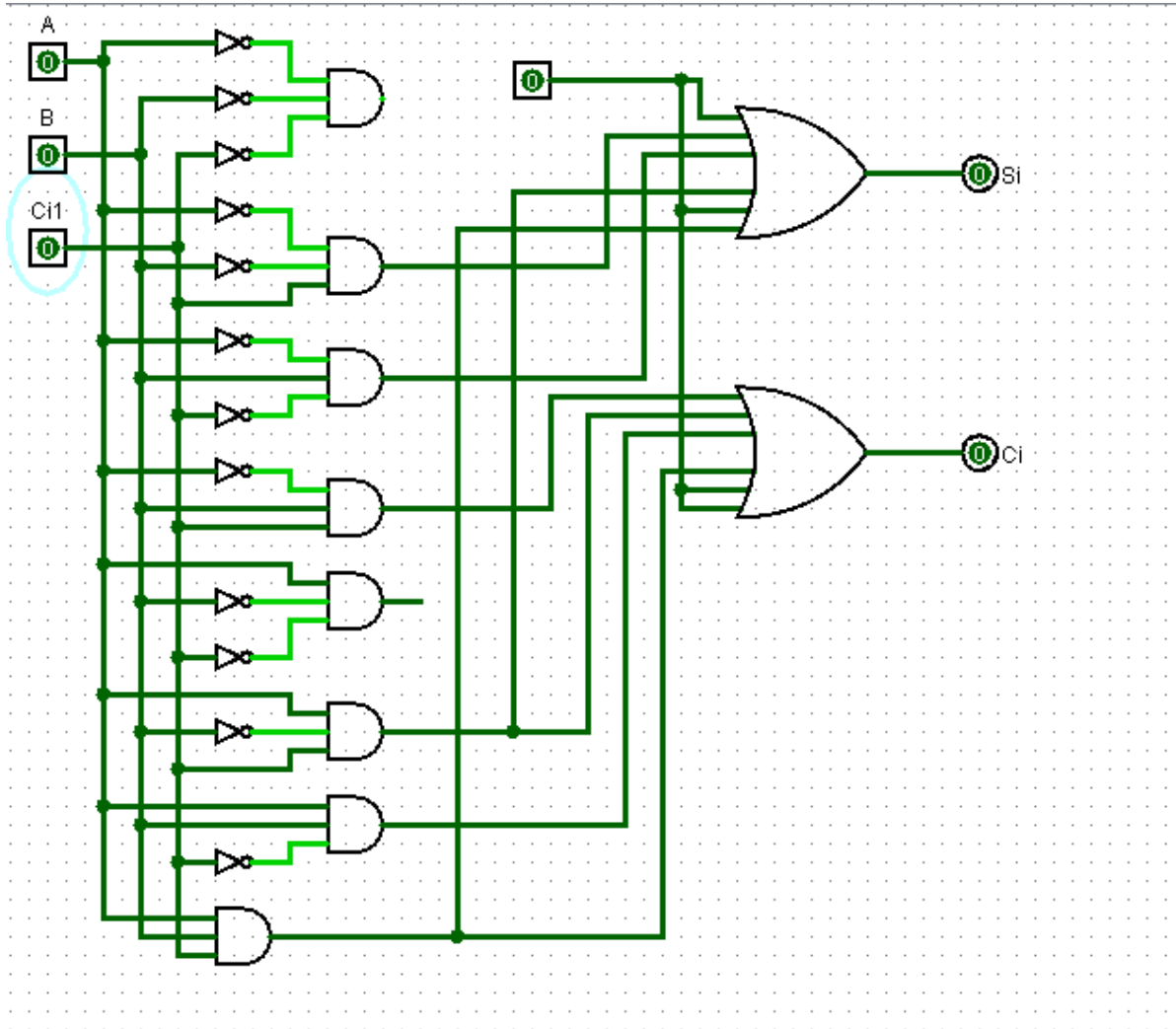
## Question 7

a) 3

b) c1 3 s1 5 c2 6 c3 9 s3 11 propagation delay is 11

## Question 8

C



## Question 9

第一排表示按下的楼层，第一列表示当前的楼层,表格中元素表示电梯行为

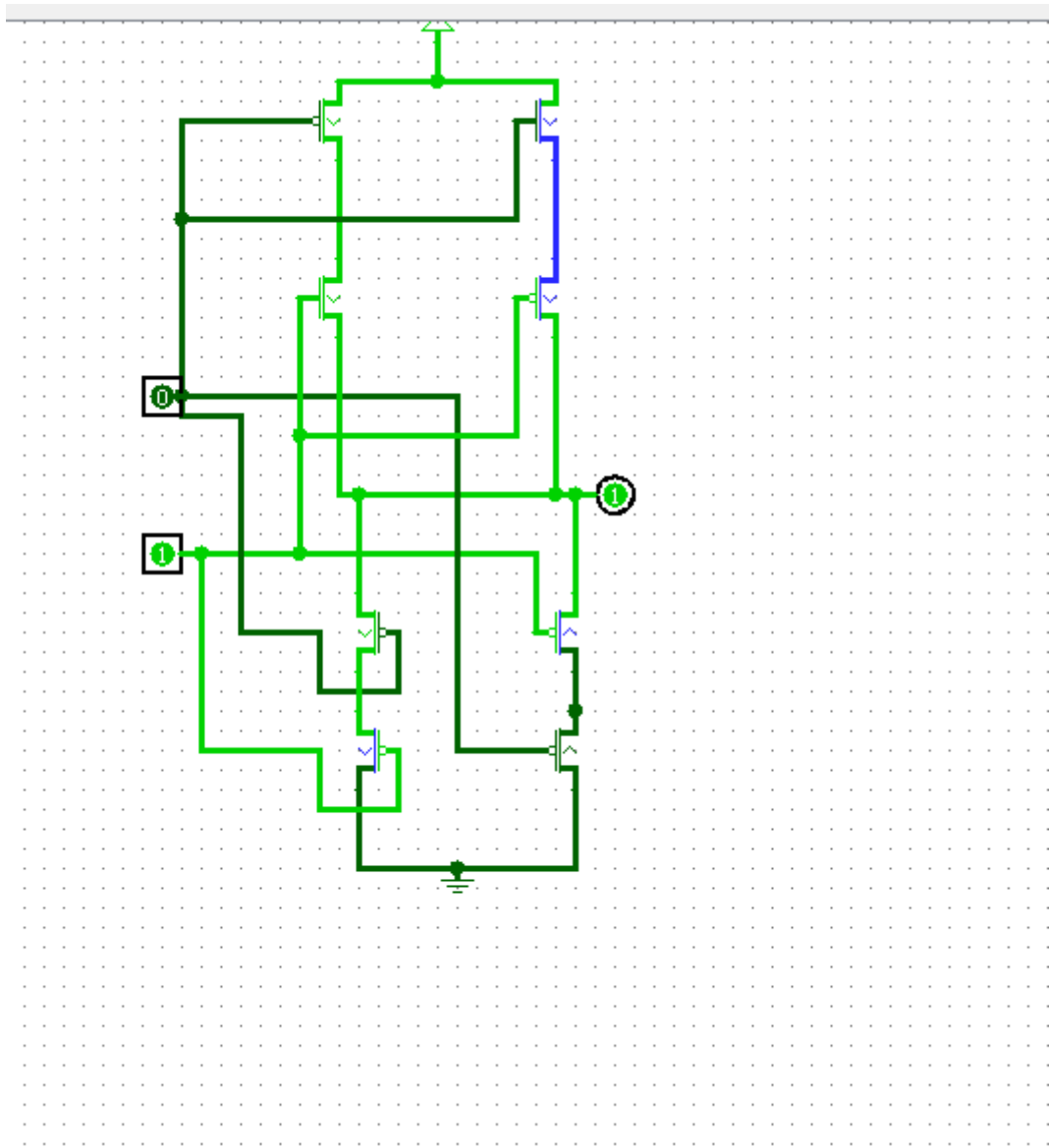
	1	2	3	4
1	stay in floor 1	stay in floor 1	goto floor 3	goto floor 4
2	stay in floor 2	stay in floor 2	stay in floor 2	goto floor 4
3	goto floor 1	stay in floor 3	stay in floor 3	stay in floor 3
4	goto floor 1	goto floor 2	stay in floor 4	stay in floor 4

## Question 10

After 50 cycles 110000

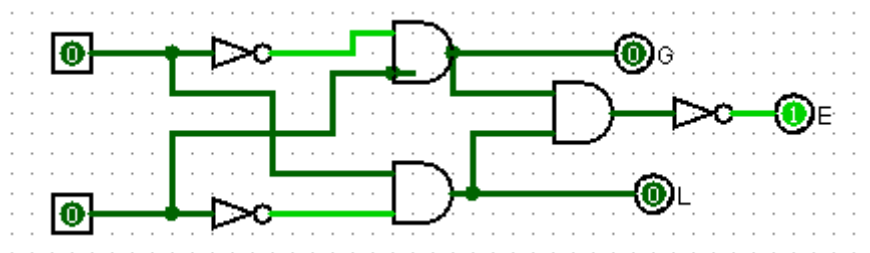
takes 12cycles

## Question 11



## Question 12

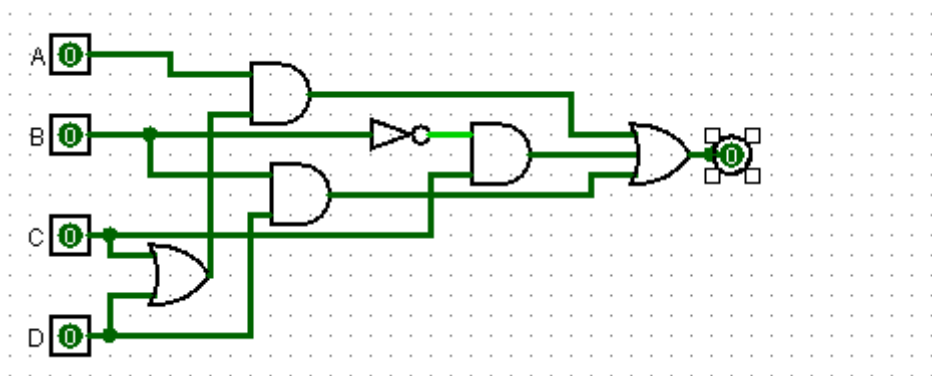
A	B	E	L	G
0	0	1	0	0
1	0	0	1	0
1	1	0	0	1
0	1	1	0	0



## Question 13



A	B	C	D	Z
1	0	1	0	1
1	0	0	1	1
1	1	0	1	1
1	1	1	0	1
0	1	1	0	0
0	1	0	1	1
0	0	0	1	0
0	0	1	0	1



## Question 14

只要证明NAND可以构成AND OR NOT三种集合

将NAND输入端并接得到NOT

将NAND后接NOT，得到AND

将NAND输入端各接一个NOT，得到OR