

V_i

$Q_2 \backslash Q_1$	00	01	11	10
0	0	0	1	1
1	0	0	0	1

R_i

$Q_2 \backslash Q_1$	00	01	11	10
0	1	1	0	0
1	1	1	0	0

A_i

$Q_2 \backslash Q_1$	00	01	11	10
0	0	0	0	0
1	0	0	1	0

V_d

$Q_2 \backslash Q_1$	00	01	11	10
0	1	1	0	0
1	1	0	0	0

Q_n				Q_{n+1}			Output
Q_2	Q_1	Q_0	$S_0 S_1$	Q_2	Q_1	Q_0	
0	0	0	X0	0	0	0	001100
0	0	0	X1	0	0	1	001100
0	0	1	XX	0	1	0	001100
0	1	0	XX	0	1	1	001010
0	1	1	XX	1	0	0	100001
1	0	0	0X	1	0	0	100001
1	0	0	1X	1	0	1	100001
1	0	1	XX	1	1	0	100001
1	1	0	XX	1	1	1	010001
1	1	1	XX	0	0	0	001100

$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	0	0	0	0
10	0	0	0	0

$S_i = 1$

$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	0	1	1	0
01	0	1	1	1
11	0	0	0	0
10	0	0	0	0

$S_i = 0$

Q_0

$$\overline{Q_2} \overline{Q_0} S_1 + Q_1 \overline{Q_0} + \overline{Q_0} S_0 Q_2$$

$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	0	1	1	0
01	0	1	1	0
11	1	0	0	1
10	1	0	0	1

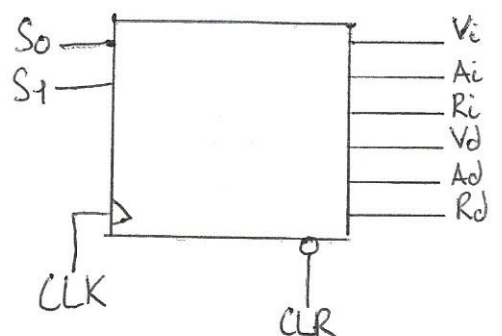
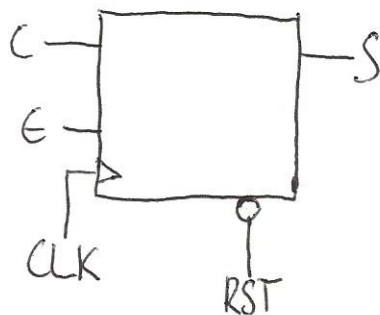
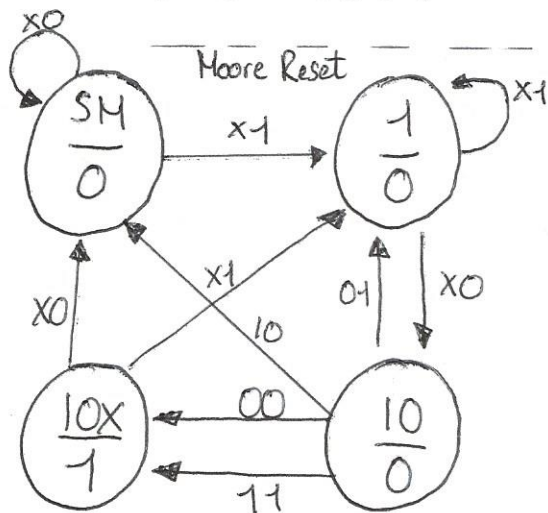
$S_i = 1$

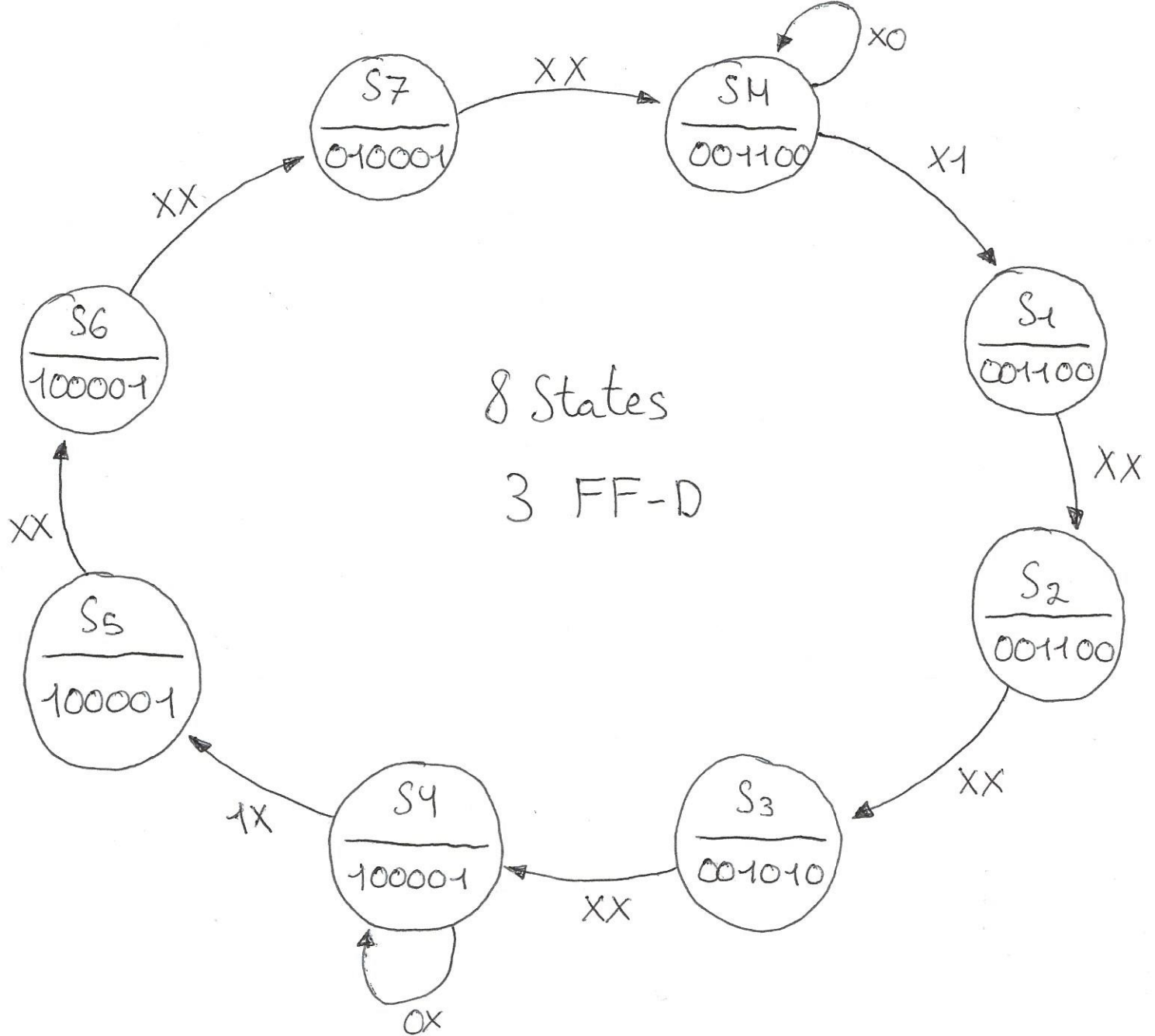
$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	0	1	1	0
01	0	1	1	0
11	1	0	0	1
10	1	0	0	1

$S_i = 0$

Q_1

$$\overline{Q_1} Q_0 + \overline{Q_0} Q_1$$





	Q ₂	Q ₁	Q ₀	
S0	0	0	0	001100
S1	0	0	1	001100
S2	0	1	0	001100
S3	0	1	1	001010
S4	1	0	0	100001
S5	1	0	1	100001
S6	1	1	0	100001
S7	1	1	1	010001

Q₀ = 0F090F0A

Q₁ = 0FF00FF0

Q₂ = 0FFFF000

V_i = 00FFFF000

A_i = 0F0000000

R_i = F00000FFF

V_d = FF000000F

A_d = 000000F00

R_d = 0FFFF000

$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	0	1	0	1
10	0	1	0	1

$$S_i = 1$$

$Q_2 Q_1$				
$Q_0 S_0$	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	0	1	0	1
10	0	1	0	1

$$S_i = 0$$

Q_2

$$\bar{Q}_2 Q_1 Q_0 + Q_2 \bar{Q}_0 + Q_2 \bar{Q}_1$$

Output

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

$Q_2 \bar{Q}_0 + Q_2 \bar{Q}_1$

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

$Q_2 Q_1 Q_0$

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

\bar{Q}_2

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

$\bar{Q}_2 \bar{Q}_0 + \bar{Q}_2 \bar{Q}_1$

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

$\bar{Q}_2 Q_1 Q_0$

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

Q_2

$$Q_0^{n+1} = \bar{Q}_2 \bar{Q}_0 S_1 + Q_1 \bar{Q}_0 + Q_2 \bar{Q}_0 S_0$$

$$Q_1^{n+1} = \bar{Q}_1 Q_0 + Q_1 \bar{Q}_0$$

$$Q_2^{n+1} = \bar{Q}_2 Q_1 Q_0 + Q_2 \bar{Q}_0 + Q_2 \bar{Q}_1$$

$$V_i = Q_2 \bar{Q}_0 + Q_2 \bar{Q}_1$$

$$A_i = Q_2 Q_1 Q_0$$

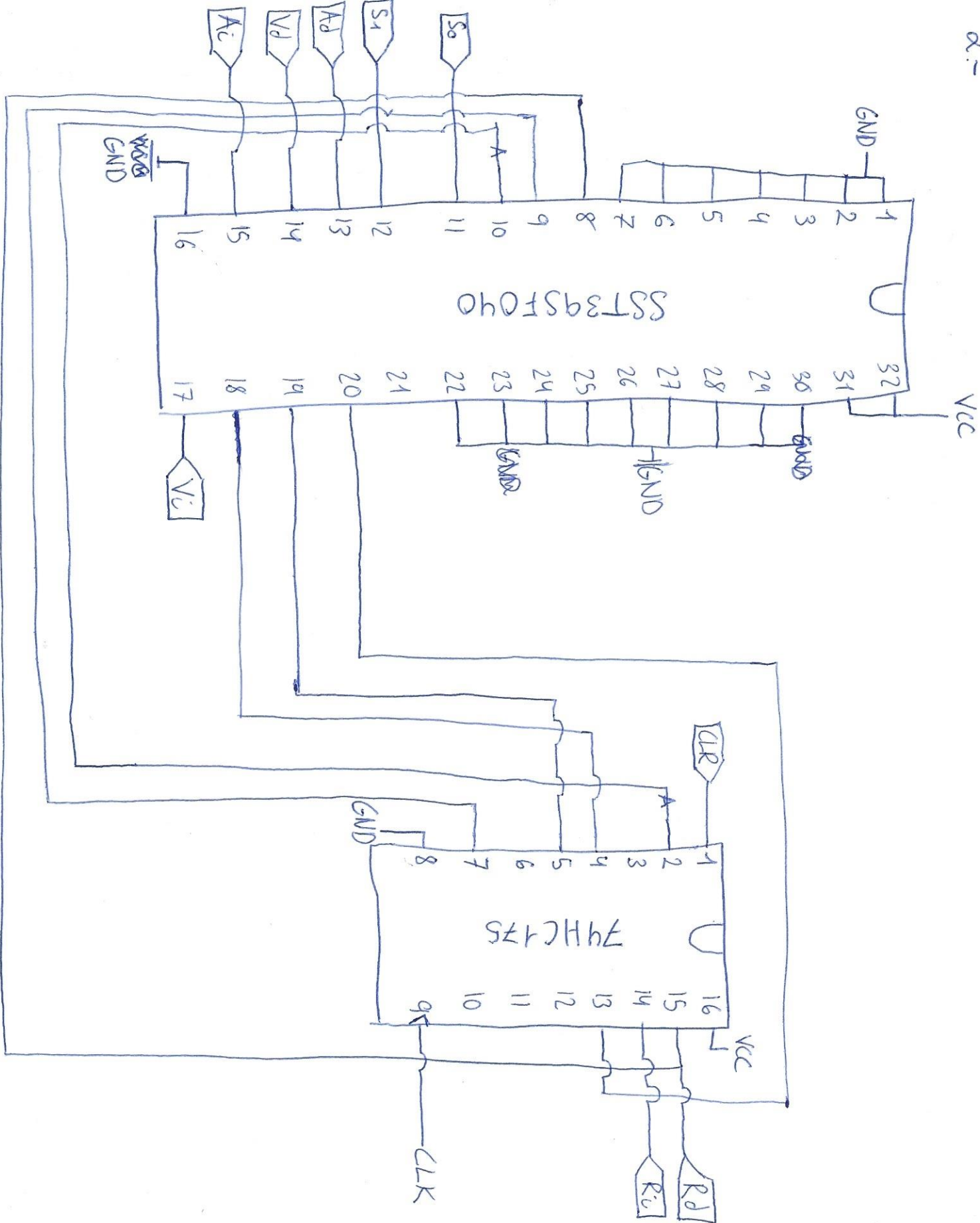
$$R_i = \bar{Q}_2$$

$$V_d = \bar{Q}_2 \bar{Q}_0 + \bar{Q}_2 \bar{Q}_1$$

$$A_d = \bar{Q}_2 Q_1 Q_0$$

$$R_d = Q_2$$

2.-



1.3.- First the cars on the right advance, Then S_0 is activated, but nothing happens as the cars are already advancing, until S_1 activates. After two clock cycles, the right light goes yellow while the left light turns red. In the next stage, the right light becomes red whereas the left light becomes green. This is until S_0 activates again, in which case, after two clock cycles the left light turns yellow as the right one becomes red. Finally, the left light goes red while the right one goes green. This process will vary taking into account the values of S_0 and S_1 . If S_0 and S_1 are active, they will change depending on the traffic lights. If first they are (Red, Green), the cycle will be (Red, Yellow) and then (Green, Red). Then, if first they are (Green, Red), the cycle will be (Yellow, Red) and then (Red, Green).

In the second process, the one that takes place after the first one is over is basically the same. The only thing that changes are when S_0 and S_1 activate. Instead of S_0

The second process starts with (Red, Green). When S_1 activates and after two clock cycles, the lights turn (Red, Yellow) and afterwards (Green, Red). Then, S_0 activates and after two clock cycles they become (Yellow, Red) and finally turning into (Red, Green). This process will also vary depending on the values of S_0 and S_1