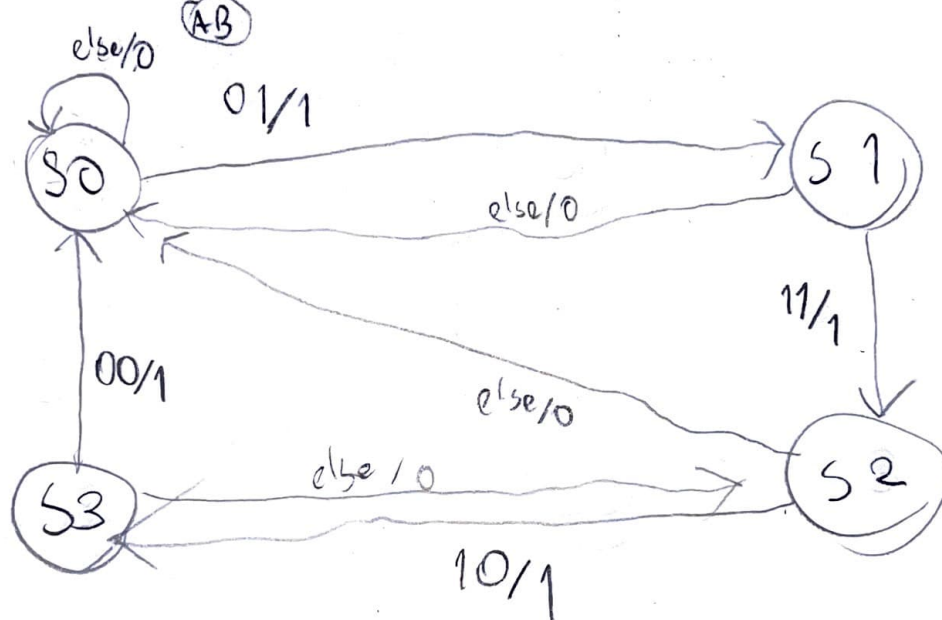


- 1-) S0: If $A=0$ and $B=0$, stay in S0. If $A=0$ and $B=1$ go to S1
- S1: If $A=0$ and $B=1$, stay in S1. If $A=1$ and $B=1$ go to S2
- S2: If $A=1$ and $B=1$, stay in S2. If $A=1$ and $B=0$ go to S3
- S3: If $A=1$ and $B=0$, stay in S3. If $A=0$ and $B=0$ go to S0 and output $out=1$ (a whole rotation is detected)



2-)

Current state	A	B	Next state	Output
S0	0	0	S0	0
S0	0	1	S1	0
S1	0	1	S1	0
S1	1	1	S2	0
S2	1	1	S2	0
S2	1	0	S3	0
S3	1	0	S3	0
S3	0	0	S0	1

3-)

for Q1 Next

AB Q1Q0	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	0	1	1
10	1	1	0	0

AB Q1Q0	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	0	1	0	0
10	0	0	0	0

$$Q0 \wedge (A \oplus B) \oplus Q1$$

$$Q1 \wedge \overline{Q0} \wedge \overline{A} \wedge \overline{B}$$

for Q0 next

AB Q1Q0	00	01	11	10
00	0	1	0	0
01	0	1	0	0
11	0	1	1	0
10	1	1	0	0

$$A \oplus B \oplus Q0$$

I designed the state machine circuit according to these