Ex5 – Intro til PLC

Part 1

in0 = switch 1
in1 = switch 2
out0 = red

```
0001 PROGRAM PLC_PRG
0002 VAR
0003     A: BOOL;
0004     B: BOOL;
0005     X: BOOL;
0006 END_VAR
```

```
0001     LDN     in0
0002     AND     in1
0003     ST      A
0004     LDN     in1
0005     AND     in0
0006     ST      B
0007     LD      A
0008     OR      B
0009     ST      out0
0010
```

Part 2

n	1	2	3	red
0	0	0	0	1
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	0
7	1	1	1	1

red

1 \ 2 3	00	01	11	10
0	1	0	1	0
1	0	1	1	0

n	1	2	3	ellow
0	0	0	0	0
1	0	0	1	1
2	0	1	0	1
3	0	1	1	1
4	1	0	0	1
5	1	0	1	0
6	1	1	0	1
7	1	1	1	0

yellow

1 \ 2 3	00	01	11	10
0	0	1	1	1
1	1	0	0	1

n	1	2	3	reen
0	0	0	0	1
1	0	0	1	1
2	0	1	0	0
3	0	1	1	0
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

green

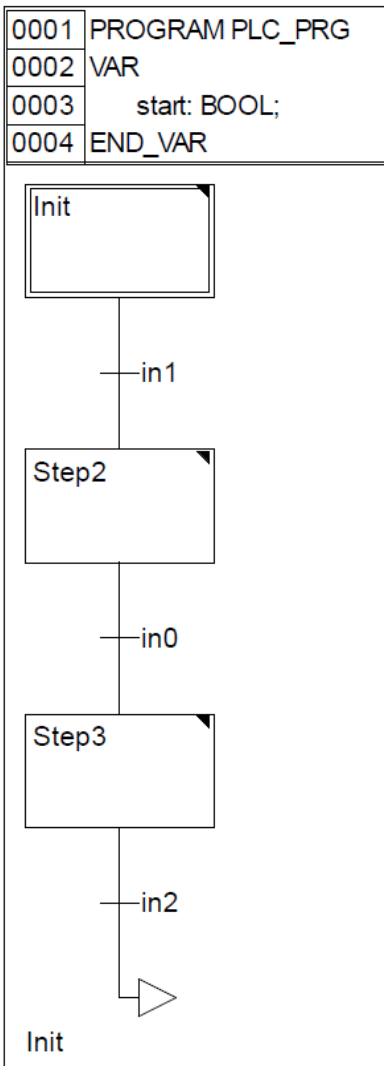
1 \ 2 3	00	01	11	10
0	1	1	0	0
1	0	1	0	1

$Red = (s1's2's3') + (s2s3) + (s1s3)$
$yellow = (s1s3') + (s1's3) + (s1's2)$
$green = (s1's2') + (s2's3) + (s1s2s3')$

```
1  FUNCTION_BLOCK FUNCBLOCK
2  VAR_INPUT
3      S1, S2, S3: BOOL;
4  END_VAR
5  VAR_OUTPUT
6      Red,Yellow, Green: BOOL;
7  END_VAR
8
9  Red := (S1 AND NOT S2 AND NOT S3) OR (S2 AND S3) OR (S1 AND S3);
10 Yellow := (S1 AND NOT S3) OR (NOT S1 AND S3) OR (S1 AND NOT S2);
11 Green := (NOT S1 AND NOT S2) OR (NOT S2 AND S3) OR (S1 AND S2 AND NOT S3);
12 VAR
13 END_VAR
14
```

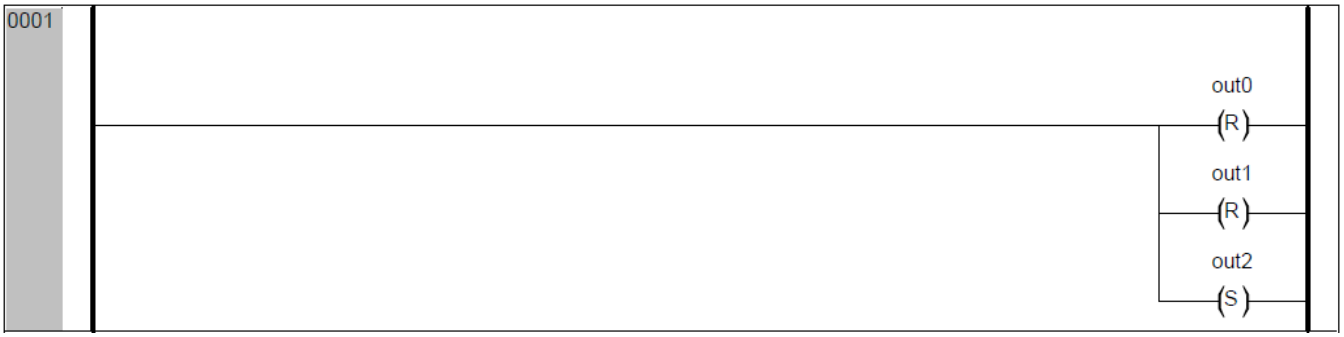
100 %

Part 3



in0(sw0) = LH
in1(sw1) = start
in2(sw2) = LL
out0 = red(v1)
out1 = yellow(v2)
out2 = green(rest position)

Init



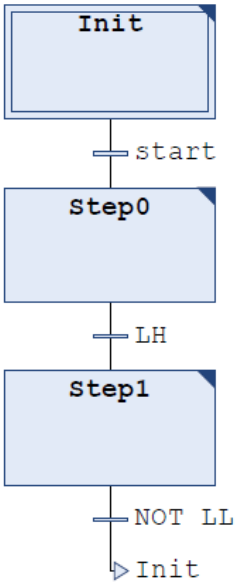
Step2

Step3

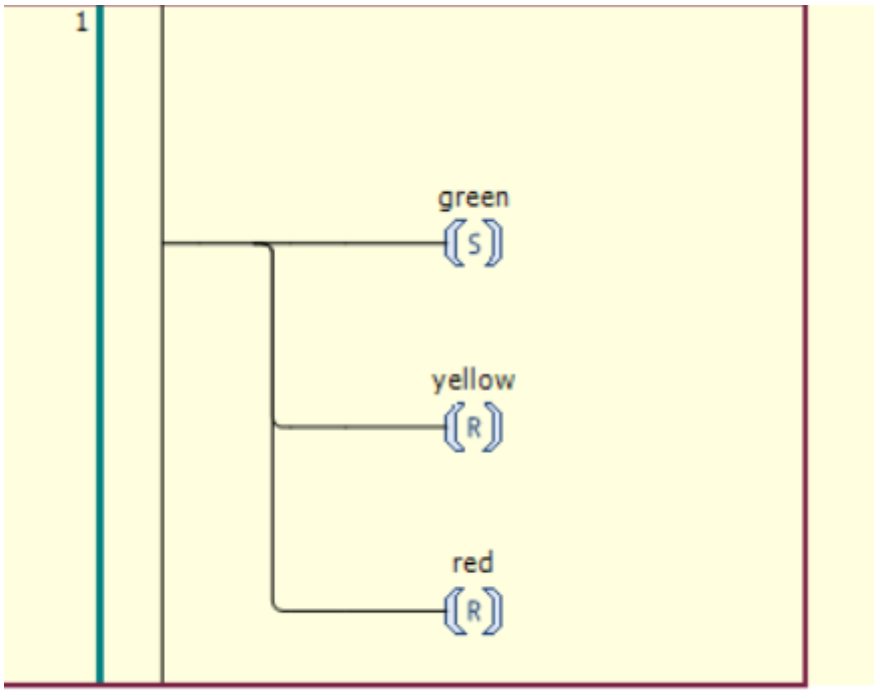
Part 4

I used "simulation" on my computer to test part 4.

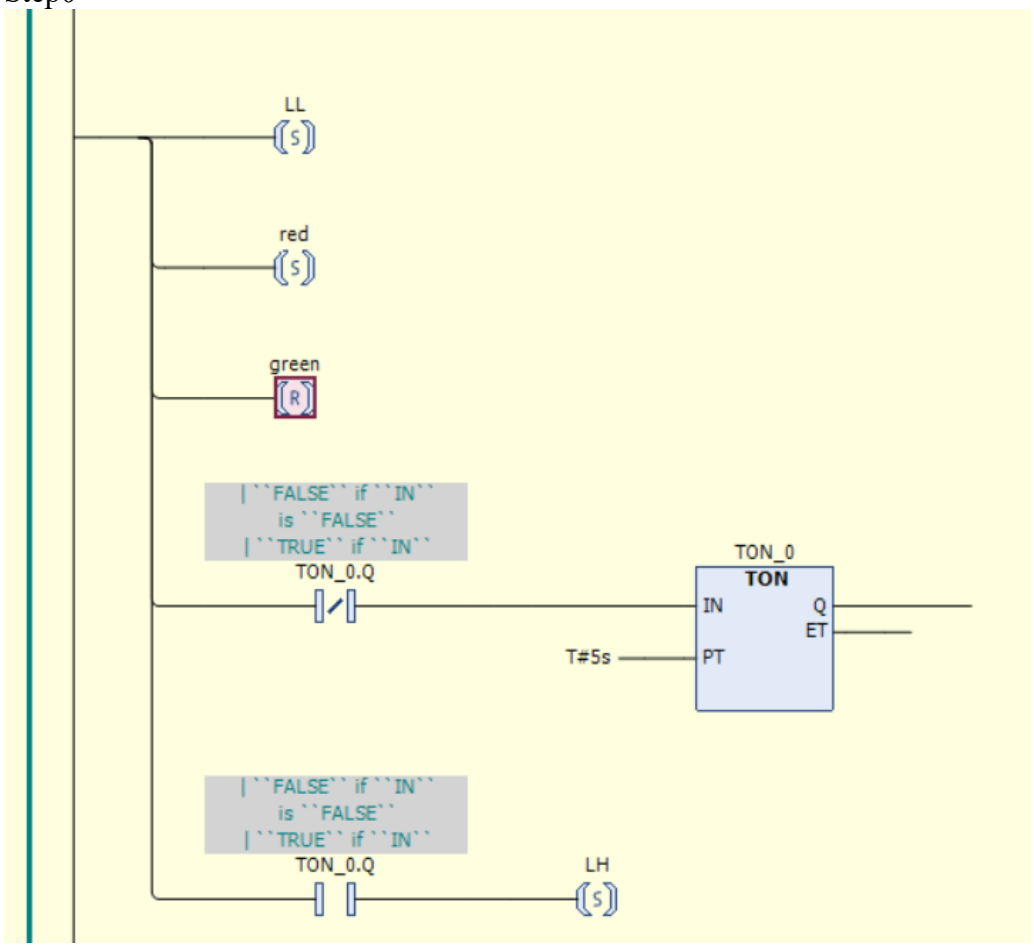
```
1   PROGRAM PLC_PRG
2   VAR
3       start : BOOL ;
4       LL : BOOL ;
5       LH : BOOL ;
6       TON_0 : TON ;
7       T0 : TIME ;
8       TON_1 : TON ;
9       T1 : TIME ;
10      green : BOOL ;
11      red : BOOL ;
12      yellow : BOOL ;
13  END_VAR
14
```



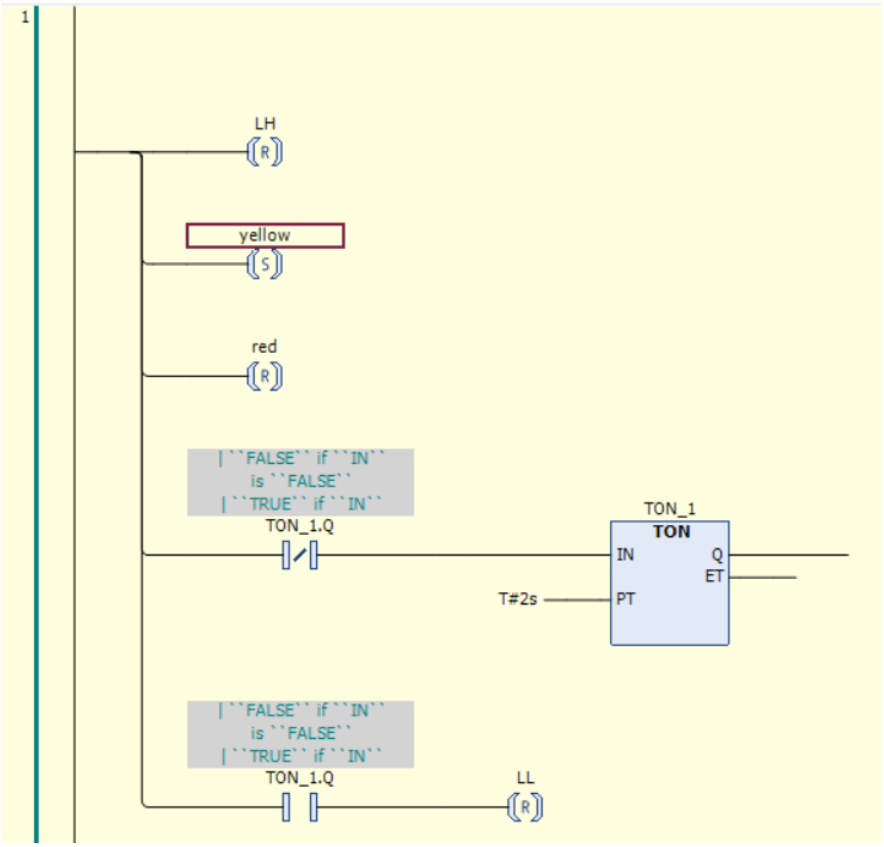
Init step


1
green
S
yellow
R
red
R

Step0


LL
S
red
S
green
R
``FALSE`` if ``IN`` is ``FALSE`` ``TRUE`` if ``IN``
TON_0.Q
TON_0
TON
IN
Q
ET
T#5s
PT
``FALSE`` if ``IN`` is ``FALSE`` ``TRUE`` if ``IN``
TON_0.Q
LH
S

Step1


1
LH
R
yellow
S
red
R
| ``FALSE`` if ``IN`` is ``FALSE`` | ``TRUE`` if ``IN``
TON_1.Q
TON_1
TON
IN
Q
ET
T#2s
PT
| ``FALSE`` if ``IN`` is ``FALSE`` | ``TRUE`` if ``IN``
TON_1.Q
LL
R