**Assignment 3:** Develop the logic and the HMI for a simplified electronic voting machine.

**Inputs:** 1) **Voting_enabled** (toggle switch)

2) **Polling_officer** (push button, momentary contact)

3) **A, B, C** (push button, momentary contact, one for each candidate)

4) **Result** (toggle switch)

**Outputs:** 1) **Lamp_A, Lamp_B and Lamp_C.**

2) **Votes_A, Votes_B, Votes_C,** (digital display that indicates the votes obtained by candidates **A, B, C**.

3) **Audio** (audio alarm output represented by a lamp)

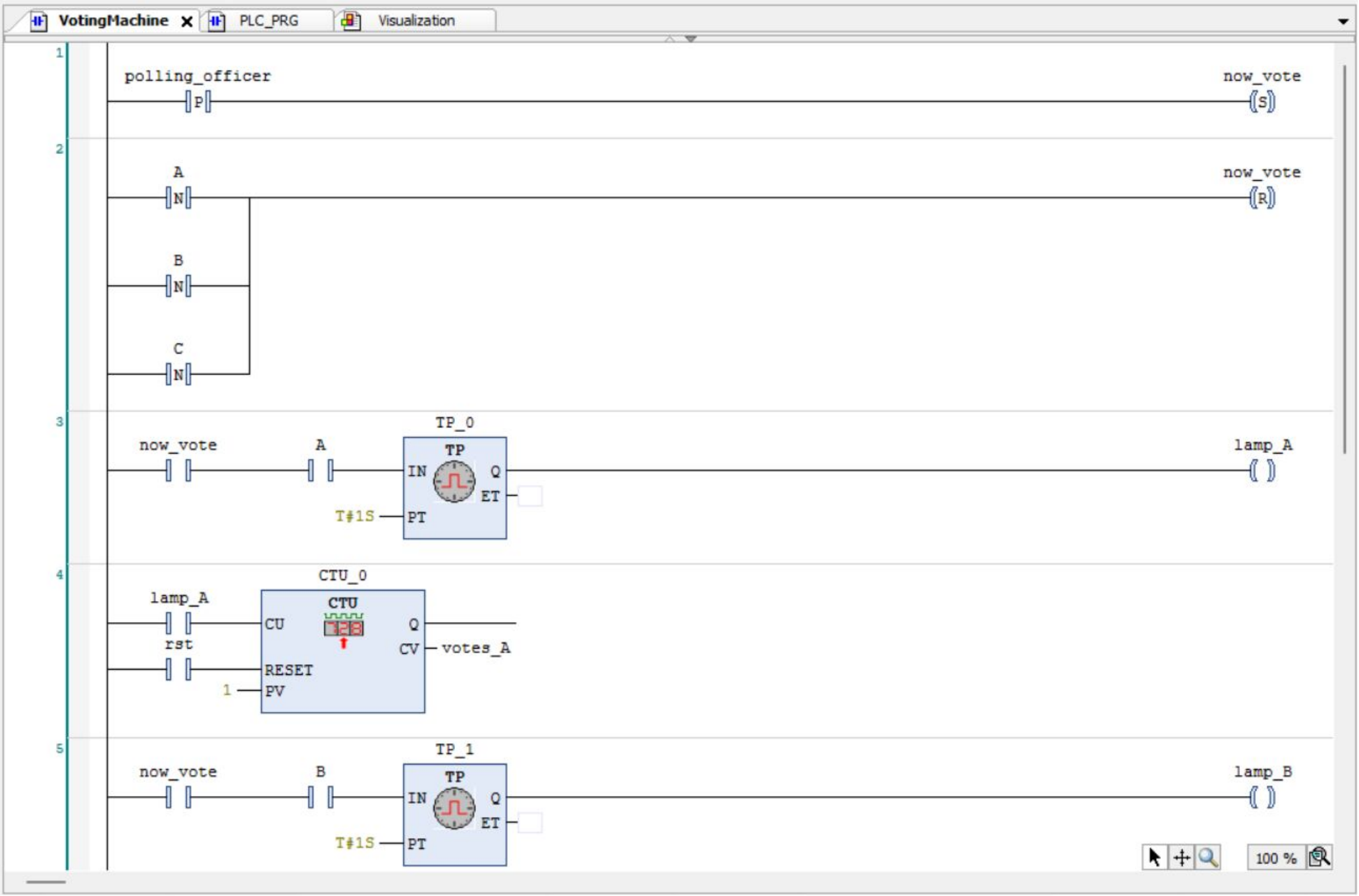
**Description:**

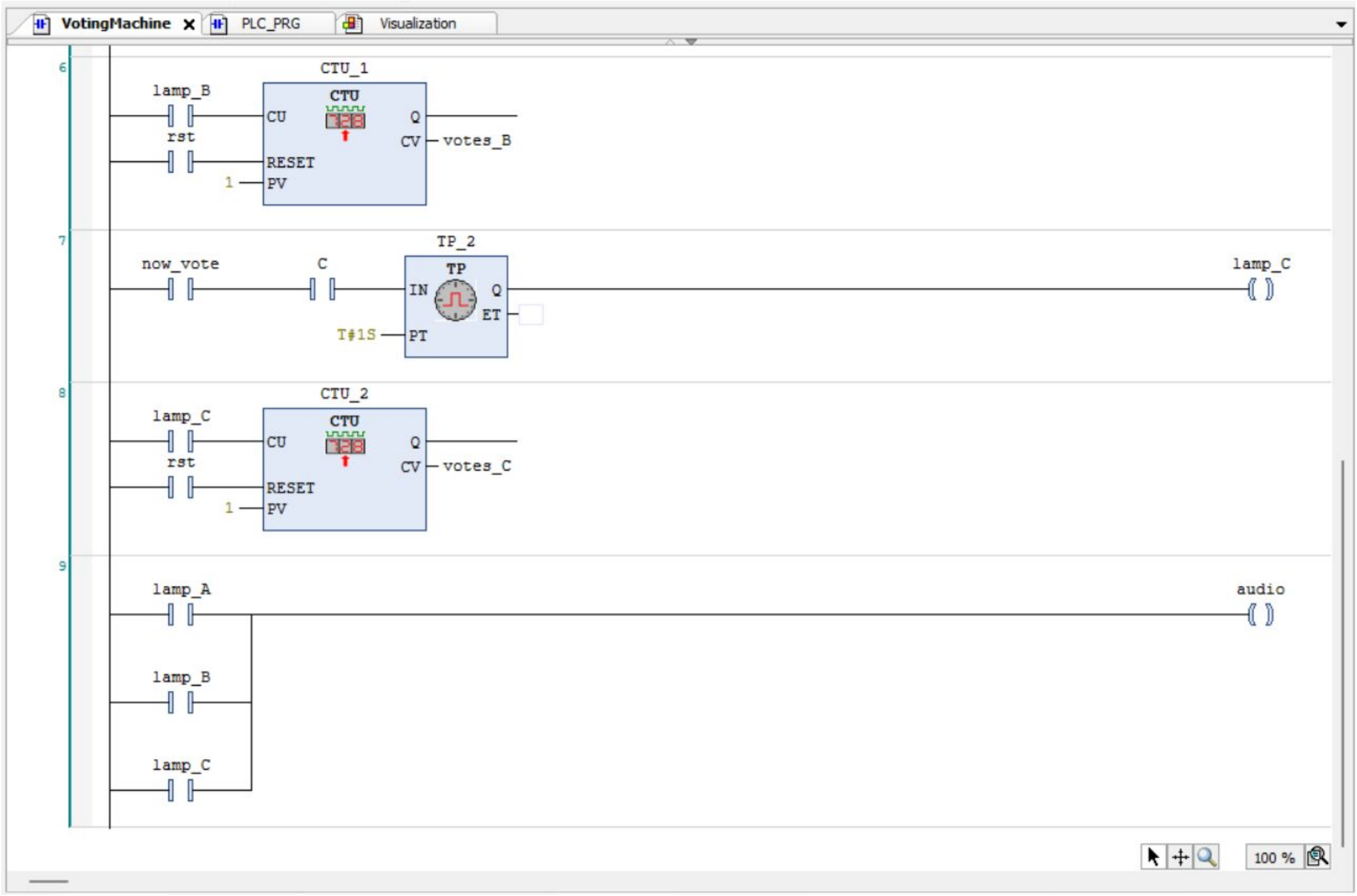
- The voting machine operates only when the **Voting_enabled** switch is on. If this switch is off, all functions of the voting machine are disabled (except the result display as explained later).

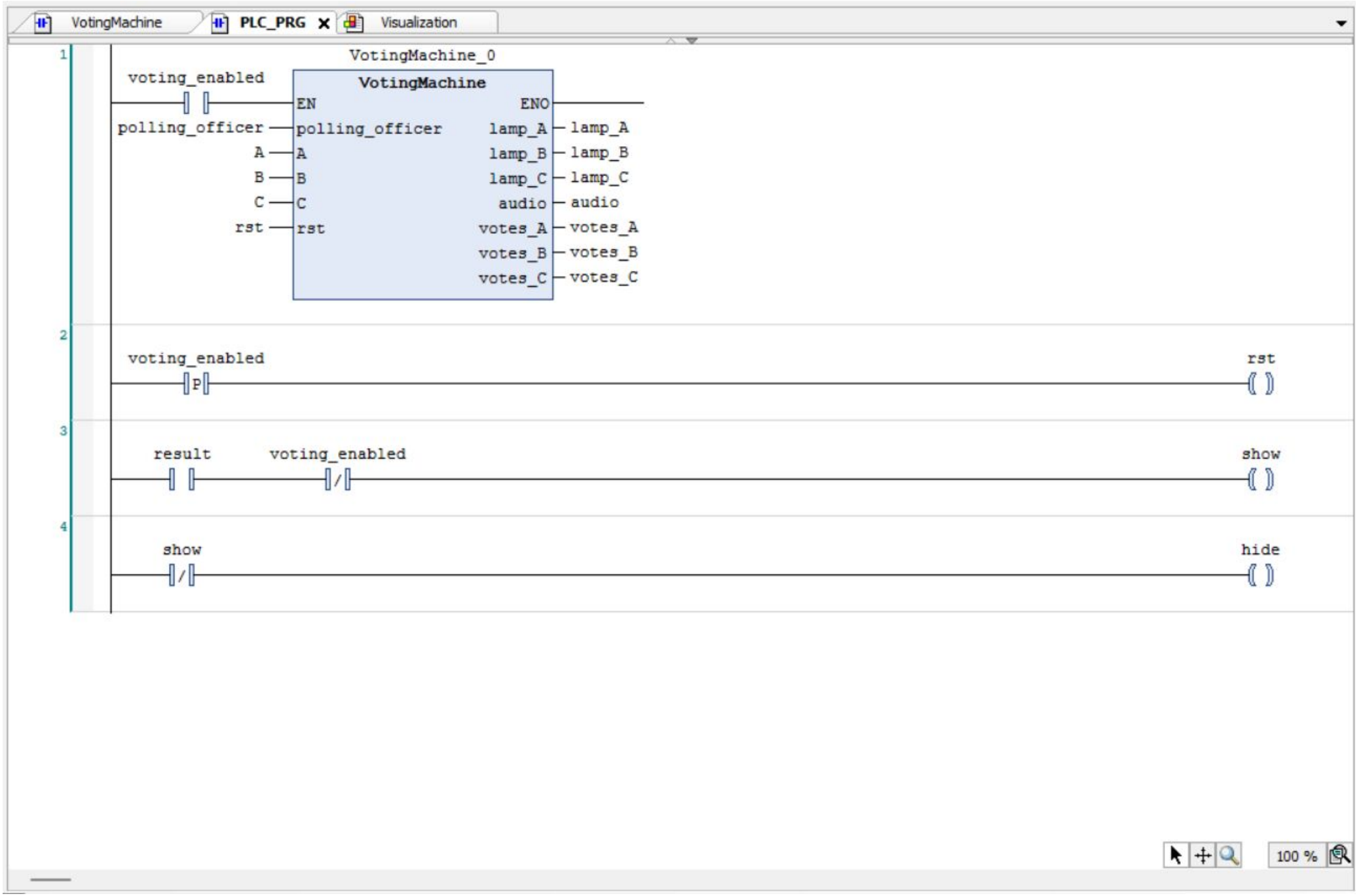
- The polling officer checks the credentials of the voter, and for a valid voter, presses the **Polling_officer** push button. This enables the voting buttons **A, B** and **C**.

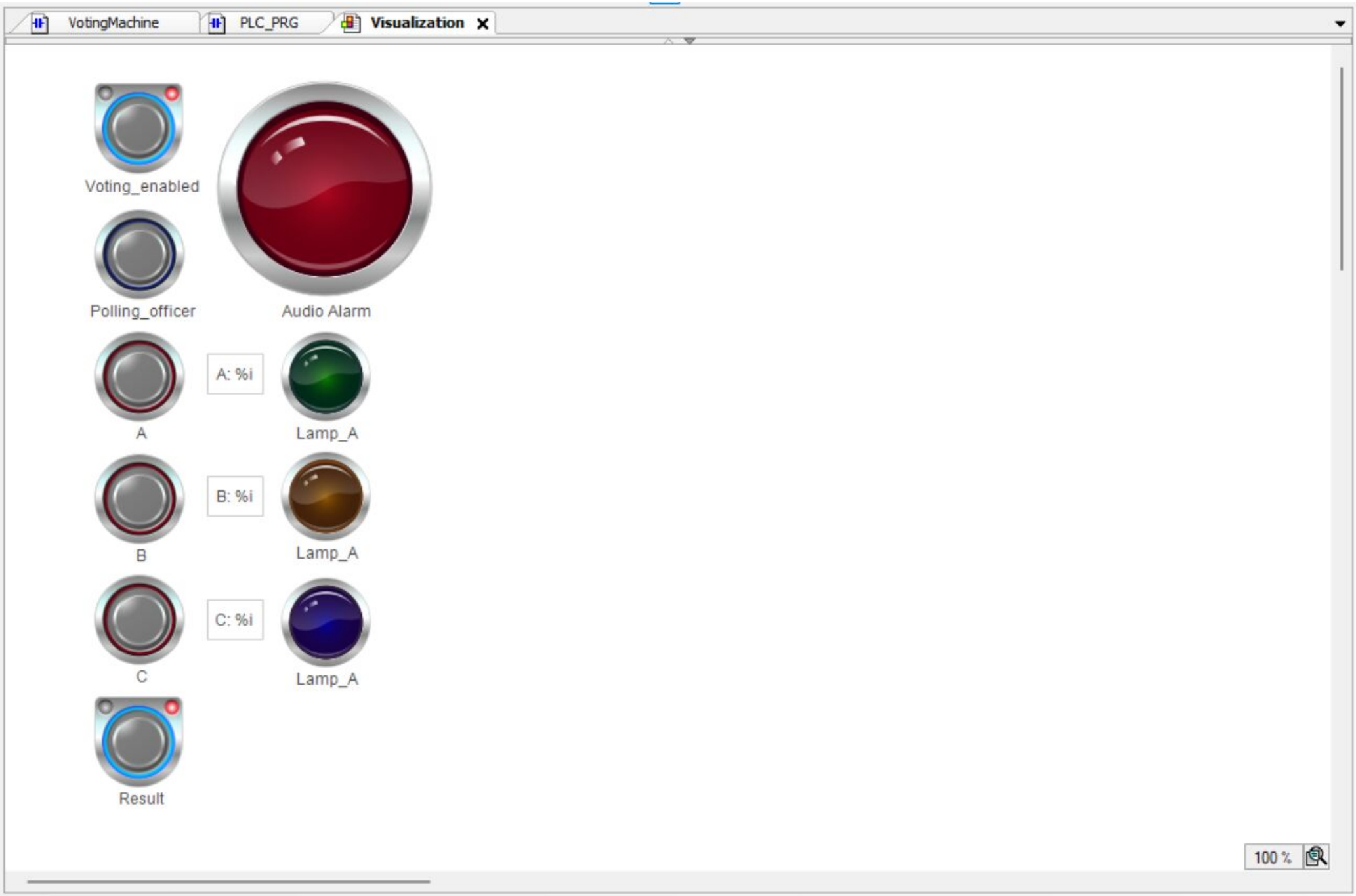
- The voter then presses any of the three buttons **A, B** and **C,** depending on the candidate that he wants to vote for. This increases the vote count of the candidate by 1. The lamp besides the name of the candidate voted for, (**Lamp_A or Lamp_B or Lamp_C)** lights up for one second to confirm that the vote has been registered. The audio alarm **Audio** is activated for one second to inform the polling officer that the voter has cast his vote. Only the first push-button pressed is registered. Multiple presses of the same button or different buttons do not register additional votes.

- When voting has been completed, the **Voting_enabled** switch is turned off to disable the machine. Now turning on the **Result** switch displays the votes obtained by each candidate. The votes obtained are displayed only if the **Voting_enabled** switch is off. The displays are invisible as long as **Voting_enabled** is true. Turning on the **Voting_enabled** switch again resets the votes obtained by the three candidates to 0 and restarts the voting process.


VotingMachine
PLC_PRG
Visualization
1
polling_officer
P
now_vote
S
2
A
N
B
N
C
N
now_vote
R
3
now_vote
A
TP_0
TP
IN
Q
ET
T#1S
PT
lamp_A
4
lamp_A
rst
CTU_0
CTU
CU
Q
CV
votes_A
RESET
1
PV
5
now_vote
B
TP_1
TP
IN
Q
ET
T#1S
PT
lamp_B
100 %


VotingMachine
PLC_PRG
Visualization
6
CTU_1
CTU
lamp_B
CU
Q
rst
CV
votes_B
RESET
1
PV
7
TP_2
TP
now_vote
C
IN
Q
lamp_C
ET
T#1S
PT
8
CTU_2
CTU
lamp_C
CU
Q
rst
CV
votes_C
RESET
1
PV
9
lamp_A
audio
lamp_B
lamp_C
100 %


VotingMachine
PLC_PRG
Visualization
1
VotingMachine_0
VotingMachine
voting_enabled
EN
ENO
polling_officer
polling_officer
lamp_A
lamp_A
A
A
lamp_B
lamp_B
B
B
lamp_C
lamp_C
C
C
audio
audio
rst
rst
votes_A
votes_A
votes_B
votes_B
votes_C
votes_C
2
voting_enabled
P
rst
3
result
voting_enabled
/
show
4
show
/
hide
100 %


VotingMachine
PLC_PRG
Visualization
Voting_enabled
Polling_officer
Audio Alarm
A: %i
A
Lamp_A
B: %i
B
Lamp_A
C: %i
C
Lamp_A
Result
100 %