**SMART TRAFFIC CONTROL**

**END SEMESTER EXAMINATION (MAY 2019)**

**COURSE: PLC (VL-BTE03)**

The following report is based on a mini project on Smart Traffic Light Control as a part of the course work Programmable Logic Circuits for the academic year 2018-2019.

**Process Definition:**

Traffic Signalling is a systematic approach to channel the flow of traffic on heavily crowded junctions wherein each direction is given the right of way by means of periodic chance. Ie. First the vehicles from the West are allowed to go while vehicles from all other directions are stopped. After this the vehicles from the North are allowed the path while all other vehicles stop. In this way all vehicles get even access. This method is known to greatly reduce the chances of accidents on the junctions.

The Smart Traffic Light Control intends to optimize traffic flow in populous cities. It senses the number of vehicles in each direction and allows the traffic flow in accordance to this data. The process can be divided as:

1. Scan Each Direction
2. For each Direction Perform the following
3. Sensing Vehicular Population.
4. Calculating of Time to allow vehicles.
5. Signalling the Green Light.

      3.   Repeat this process for each direction.

**Sequential Analysis:**

1. Scan for Vehicular Population in West Direction: The sensors sense the amount of traffic from the Western direction in terms of rows of vehicles. If just one row is filled then the west direction is not that crowded, while if 3 rows are filled then it’s pretty crowded.
2. Calculate the On time for the Green Signal for vehicles from the Western Direction: This can be done by using a Control System algorithm such as PID or even some simple lookup table.
3. Turn on the Green Signal: The time that is output by step 2 is used as the time to keep the Green Signal on for the West Direction.
4. Scan for Vehicular Population in North Direction: The sensors sense the amount of traffic from the Northern direction in terms of rows of vehicles. If just one row is filled then the direction is not that crowded, while if 3 rows are filled then it’s pretty crowded.
5. Calculate the On time for the Green Signal for vehicles from the Northern Direction: This can be done by using a Control System algorithm such as PID or even some simple lookup table.
6. Turn on the Green Signal: The time that is output by step 2 is used as the time to keep the Green Signal on for the North Direction.
7. Scan for Vehicular Population in East Direction: The sensors sense the amount of traffic from the Eastern direction in terms of rows of vehicles. If just one row is filled then the Eastern direction is not that crowded, while if 3 rows are filled then it’s pretty crowded.
8. Calculate the On time for the Green Signal for vehicles from the Eastern Direction: This can be done by using a Control System algorithm such as PID or even some simple lookup table.
9. Turn on the Green Signal: The time that is output by step 2 is used as the time to keep the Green Signal on for the East Direction.
10. Scan for Vehicular Population in South Direction: The sensors sense the amount of traffic from the Southern direction in terms of rows of vehicles. If just one row is filled then the South direction is not that crowded, while if 3 rows are filled then it’s pretty crowded.
11. Calculate the On time for the Green Signal for vehicles from the Southern Direction: This can be done by using a Control System algorithm such as PID or even some simple lookup table.
12. Turn on the Green Signal: The time that is output by step 2 is used as the time to keep the Green Signal on for the South Direction.

**Inputs:**

1. Process Start    I:0/0
2. Process Reset  I:0/1
3. Sense Row 1 of the West Direction for vehicles: I:0/2
4. Sense Row 2 of the West Direction for vehicles: I:0/3
5. Sense Row 3 of the West Direction for vehicles: I:0/4
6. Sense Row 1 of the North Direction for vehicles: I:0/7
7. Sense Row 2 of the North Direction for vehicles: I:0/8
8. Sense Row 3 of the North Direction for vehicles: I:0/9
9. Sense Row 1 of the East Direction for vehicles: I:0/10
10. Sense Row 2 of the East Direction for vehicles: I:0/11
11. Sense Row 3 of the East Direction for vehicles: I:0/12
12. Sense Row 1 of the South Direction for vehicles: I:0/17
13. Sense Row 2 of the South Direction for vehicles: I:0/18
14. Sense Row 3 of the South Direction for vehicles: I:0/19

**Output:**

1. Red Light for vehicles from West O:0/0
2. Yellow Light for vehicles from West O:0/1
3. Green Light for vehicles from West O:0/2
4. Red Light for vehicles from North O:0/3
5. Yellow Light for vehicles from North O:0/4
6. Green Light for vehicles from North O:0/5
7. Red Light for vehicles from East O:0/6
8. Yellow Light for vehicles from East O:0/7
9. Green Light for vehicles from East O:0/8
10. Red Light for vehicles from South O:0/9
11. Yellow Light for vehicles from South O:0/10
12. Green Light for vehicles from South O:0/11

**Process Diagram:**

