

2nd year communication

Digital design using Lab view project

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Introduction:

In our way to a progress world, we should interest in our roads and traffics which control in our time, we should be creative to make our roads with no accidents, so we thought to appreciate each second, car and people pacified.

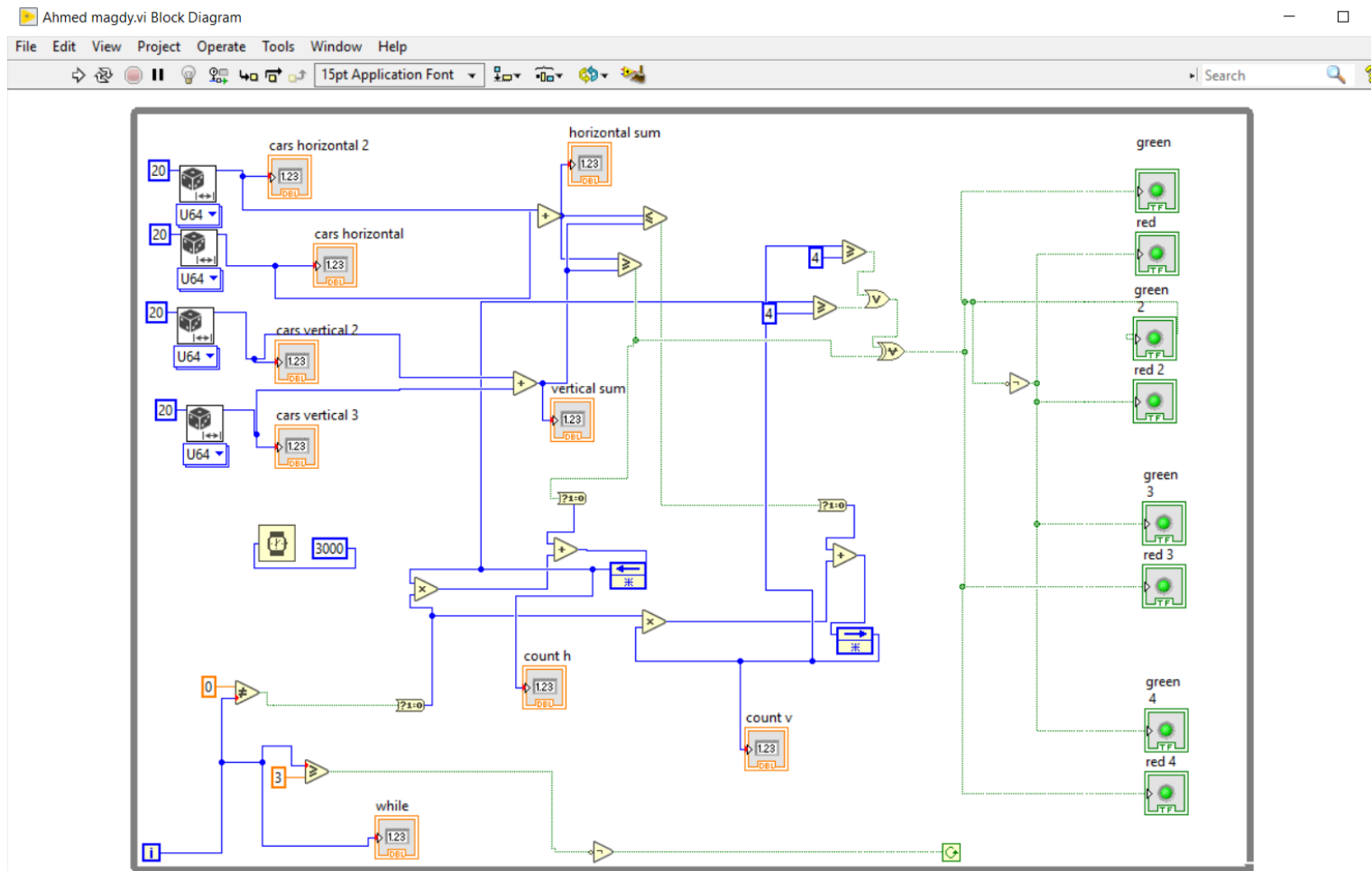
The abstract

We made a 4 traffic lights in a cross-road, which mean 2 traffic lights in the vertical road having 2 ways (way to go and other to back), and the other 2 traffic lights in the horizontal road which have also 2 ways.

The main idea (vision) is when the sum of cars in a road is bigger than the other, the couple of traffic lights in this road will be green, if a road is green three times after each other, in the fourth time the other road will be forced to be on for not waiting too much in this road.

For example: if 35 cars in the horizontal road and 50 cars in the vertical road, the two traffic lights in the vertical road will be green and if it remains to be on for 3 times it will be inverted on 4th.

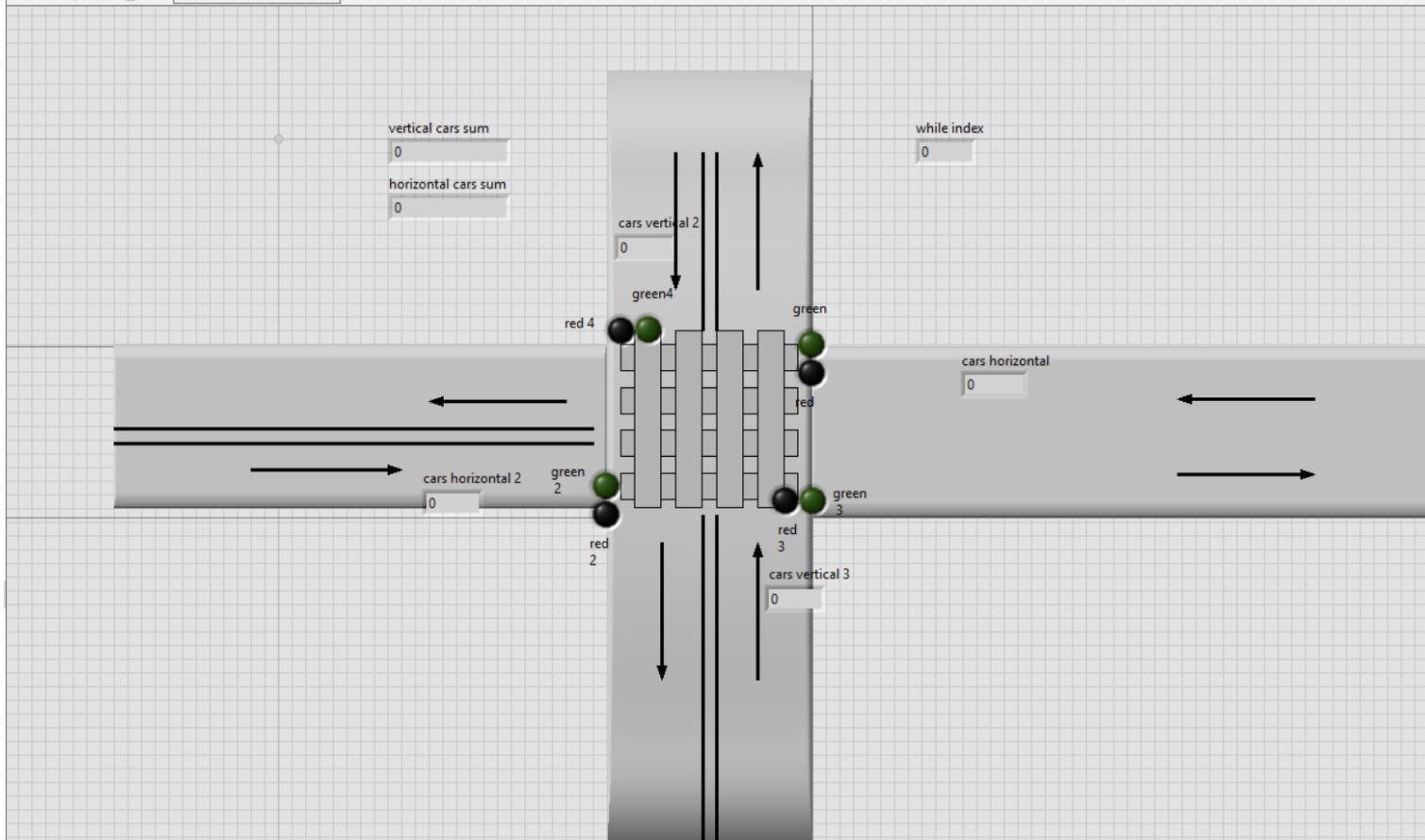
Circuit diagram:



Ahmed magdy random.vi Front Panel *

File Edit View Project Operate Tools Window Help

15pt Application Font



Components:

- 4 random components (with range of (0-20) to represent the number of cars in each direction) or using constants
- 5 Comparison gate
- 4 Addition gate
- 1 NOT-equal gate
- 2 multiplication gate
- 1 OR gate
- 1 exclusive OR gate (XOR)
- 2 NOT gate
- 8 LEDs
- While loop
- 9 Constants
- 9 Indicators

Idea and technical description:

- We compare (\geq) the sum of horizontal cars (in go and back direction) with the sum of vertical cars (in go and back direction)
- and if it returned 1 the traffic lights in H will be green and the traffic lights in V will be red and all traffic lights are synchronized

(we get the number of cars by a detecting camera in real life)

- But if the returned value of the comparison remains the same for 3 times continuously(sequentially) the traffic lights will be inverted

We take the outcome of each comparison (horizontal and vertical) then we put it in a feedback loop to count the number of ON conditions for each traffic light (we multiply the value of the feedback with the value of not-equal comparison with 0 and the while loop index to reset the counter every time the while loop is repeated).then we compare each feedback with 4 to make sure it won't be ON in 4th time then we take the value of horizontal feedback comparison OR vertical feedback comparison and put it in XOR gate with the value of the sum

comparison so when any one of the feedback comparison is 1 the XOR gate returns 0 to force the lights to be inverted.

--- our project on lab view has got two versions: -

1st one has 4 random input numbers.

2nd one has 4 inputs which enable the user to check what numbers he wants to test manually it wont be difficult to test and trace our circuit if you under stand the general idea .

Summary:

After this circuit connection on lab view we are able to accomplish a traffic system dynamic , stable , and fair using these logic gates which enable us to guarantee the ease of the flow of the traffic .