

BBM233 Project

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Solution algorithm:

There are 3 inputs and 2 outputs in this controller.

First input (greenTraffic) means “there is congestion on main road”.

Second input (grayTraffic) means “there is congestion on side road”.

Third input (clock) is clock. I used both edges and changed clock per second.

First output (greenRoadLights) and Second output (grayRoadLights) are traffic lights that [2] is “GO”, [1] is “ATTENTION”, [0] is “STOP”.

I used 4 states for that:

s0 (100) “GO”, s1 (110) “GO-ATTENTION”, s2 (011) “ATTENTION-STOP”, s3 (001) “STOP”.

I used an integer register (count) for counting elapsed seconds of states.

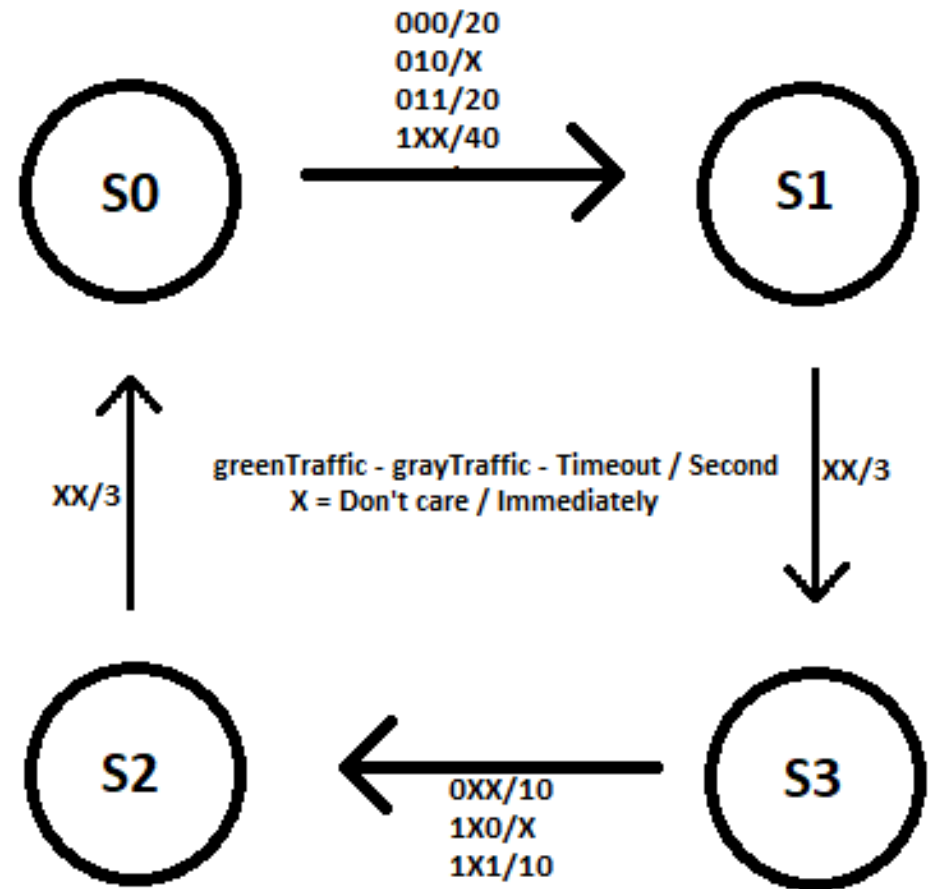
I used if-else statements for changing states.

Increased “count” every clock edge and checked “count”.

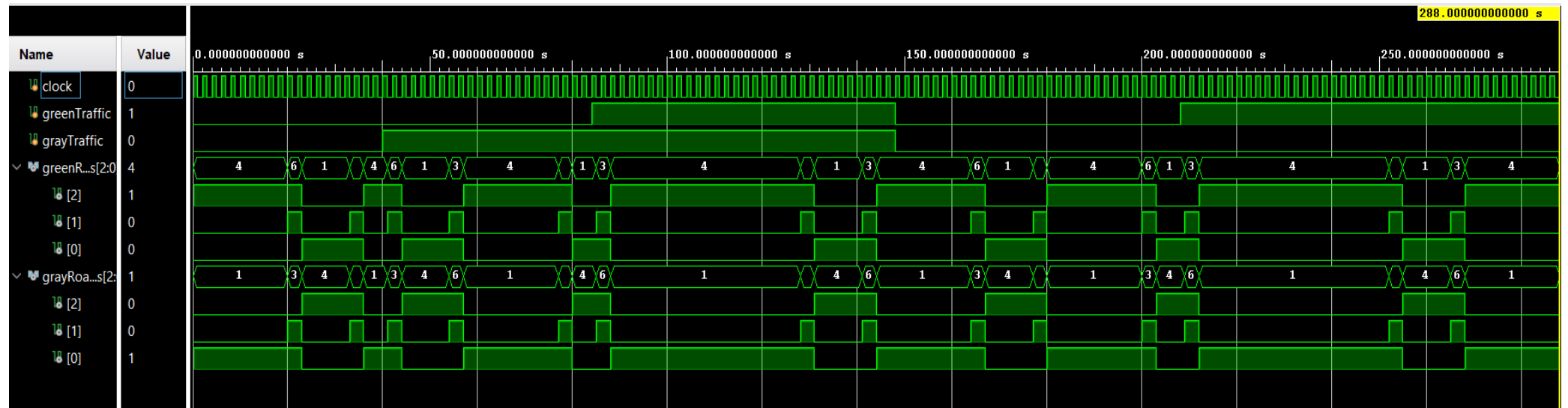
Created “Timeout” for preventing too long and too short states.

If count reaches right value: change state, reset count.

State diagram:



Testbench Results:



Notes:

In testbench, used 1000 ms instead of 1s. So in testbench I used like "#1000".