

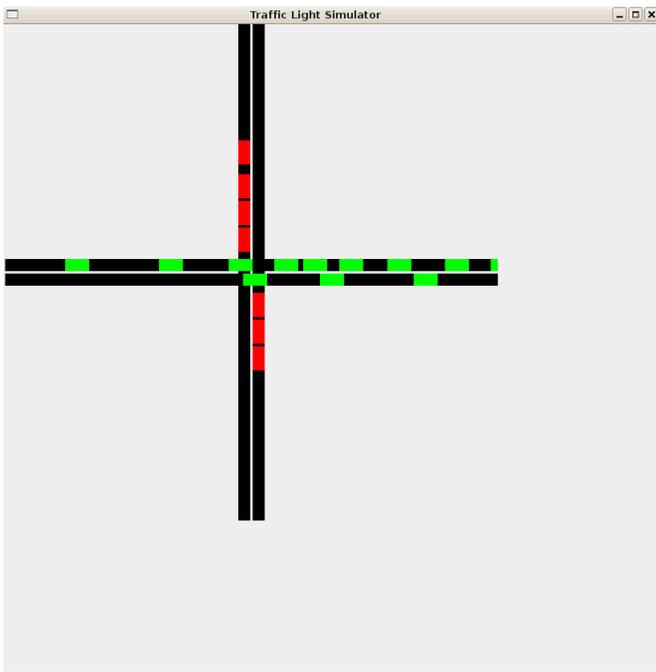
Traffic Light Simulation

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Abstract

This project is meant to simulate a busy traffic light. The cars follow all necessary rules of the road so that the simulation is realistic. The program will recognize patterns in the intersection and makes the light as efficient as possible by minimizing waiting time for cars. The patterns in the intersection are related to the time of day and the day of the week.



Results

This program looks like a realistic model of a traffic light. The cars speed up and slow down realistically, obey lights, and don't run into each other. Eventually it will be used to see what causes the most back up at an intersection. The program will find an efficient way to move cars through a particular intersection and then tell the user what the biggest problems were and how it dealt with them.

Background

There are a lot of traffic light simulations out there on the Internet. Most of the simulations are just simple intersections that use mathematical models to describe the movement of cars on a lane. There are a many variables that effect a traffic light. They include number of lanes, speed of cars, number of turning cars, etc. However, I haven't seen any simulations that learn over time. Most have a very simple light algorithm that either just switches after a certain amount of time, or switches when it detects a car has been waiting too long. Also I have not seen a simulation that has varying traffic density over a period of time.

Procedures and Methods

I am using Java to program. I have finished a very simple simulation of a traffic light. It has four lanes and a traffic light that switches every 20 seconds. I had to first set up basic rules of the road, like go for green, stop for red, and slow down when there is a car in front of you. I will now start to work on the light algorithm and then make the program learn. This way the cars do not wait forever. This light will eventually have artificial intelligence. Then, after I finish the light, I will start to add in different variables I want to include.