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23 December, 2017

Smart LED Traffic Light Project 3

I've been playing around with the LCD, RGB LED and Arduino for a couple of days now and thought of making a smart LED Traffic Light. The program asks the user 3 questions:

1. First, it asks the operator the basic question of whether he would like to use it as an emergency light or a regular traffic light. If the user responds with '1,' it is used as an emergency light. The light alternates between red and blue, mimicking the emergency lights on a police vehicle.

   However, if the operator responds to the above question by typing '0,' the light is used as a regular traffic light.
2. After establishing the above fact, the system asks the operator a second question. It asks whether the operator wants to enter the duration of the red (stop) and green (go) light once, or every time. If the operator answers '1,' he is prompted for the duration of the red and green light, respectively, in every iteration of the loop. Else, if he enters '0,' he is prompted only once, at the beginning, to enter the duration for which the 2 lights will run.

The first reason why I call this traffic light 'smart' is because it is not hard coded, rather, it is customizable, as was explained in the paragraph above.

The second reason why I call this traffic signal 'smart' is because it plays a dual role as an emergency light to warn motorists, and as a regular traffic signal, depending on the

operator's command. This light can be made easily since it only uses one RGB LED instead of the regular separate Red, Green, and Blue LEDs. This will significantly decrease the cost of production in case of widespread commercial use.

The third reason why I call it 'smart' is because it starts off at Green color signifying 'go,' so that while the operator answers the first question of whether to use the light as an emergency light or a traffic signal, traffic is not stopped and no inconvenience is caused to the motorists. If the operator decides to use it as an emergency light, then it will alternate between red and blue, however, if the operator decides to use it as a regular traffic signal, the light turns to red signaling motorists to stop. It stays red till the operator specifies the duration of the red and green light, respectively.

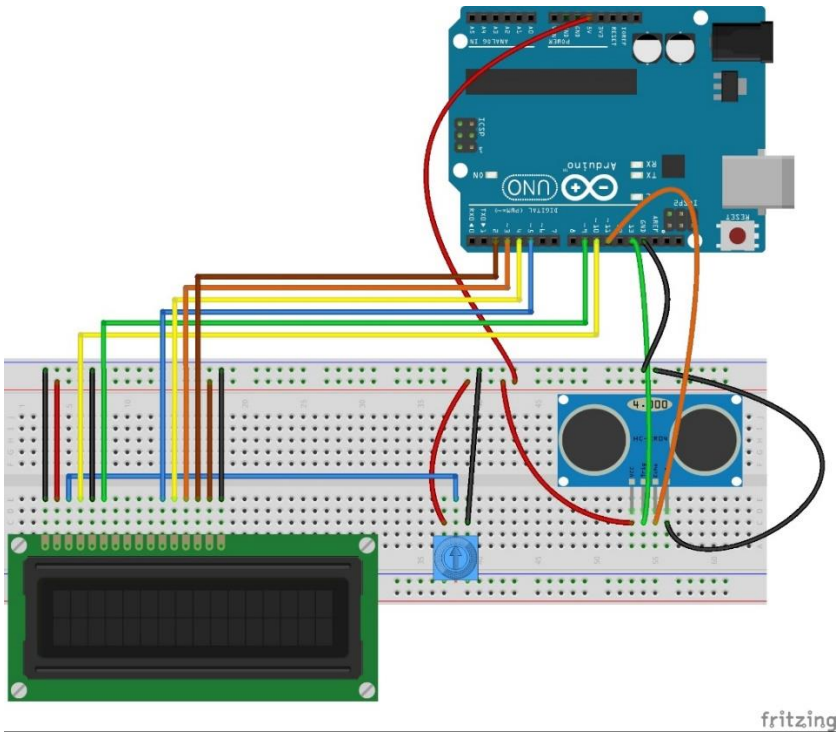
The fourth reason why I call it 'smart' is because it doesn't use the regular red, green, yellow/ orange color combination. Instead, it uses red for stop, green for go, but blue for the switch between green and red. I decided to switch yellow with blue because in case of an RGB LED, the colors green and yellow are not easily distinguishable at low brightness, especially for colorblind people like myself. To eradicate this confusion, I decided to go with blue since it is completely different.

The fifth reason why I call this light smart is because it uses an LCD screen to display appropriate messages so that even if the motorists get confused by seeing a single light traffic signal, the LCD makes it clear. If the operator decides to use it as an emergency light, the LCD displays "EMERGENCY! DRIVE CAREFULLY!" Else, if the operator decides to use it as a regular traffic signal, for red, it displays "STOP: " followed by the seconds left before the light changes, for green, it displays "GO: " followed by the seconds left before the light

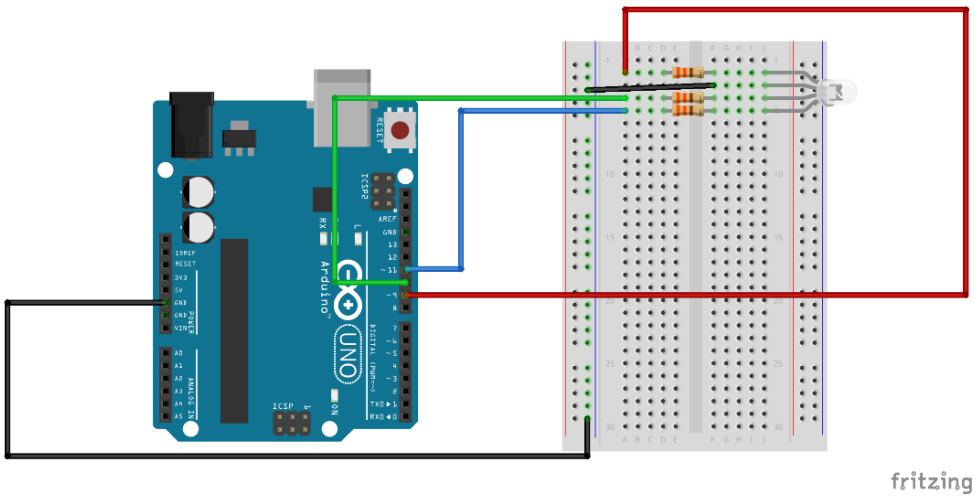
changes, and for blue, it displays “STOP IN: ” followed by the seconds left before the light changes.

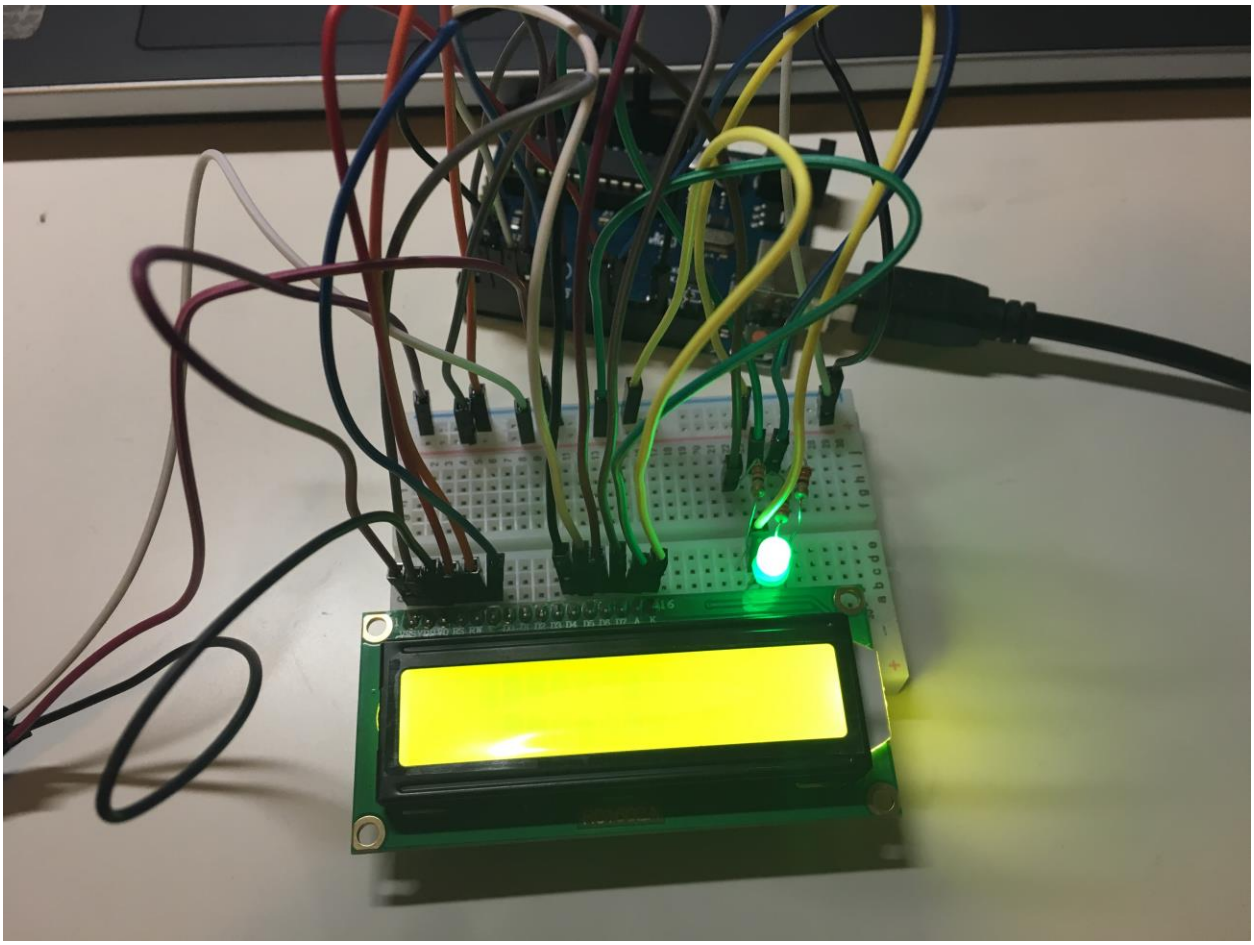
The above points make it a versatile and smart traffic light.

LCD Circuit Diagram



RGB LED Circuit Diagram





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