International Islamic University Chittagong

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Project Proposal

Submitted to

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Proposal Name: Arduino Traffic Light Simulator

Motivation: Traffic light is an optical signaling device used to indicate different signals related to traffic, rail, pedestrians etc. Basically, this process is implemented to maintain rules and regulation as well as to make the people's life easier.
There will be mess, huge traffic jams and many other severe problems if the overall transportation system goes without any controlling unit. Traffic light simulator can work to eradicate this problem if it can be implemented precisely.

Idea: This project aims to demonstrate traffic light signals using the functionality of an Arduino. Here, LED is used in place of real traffic light. LED will be powered up by Arduino UNO and a code will be uploaded to it. Once it starts simulating, LED will start blinking like a traffic light and remain stable in a specific color for a constant time. This process will be continued periodically.

Features:

1. Stability in a specific color for a certain amount of time
2. Periodic sequence of light blinking i.e., green, yellow, red, green and so on in this manner.
3. The process continuous unless any controlling unit interrupts on the software or hardware behind it.

Limitations:

1. There may be unnecessary traffic jam in a free road due to the red signal.

2. Transportation pressure in road varies in different times in a day but the traffic signal is of constant time. It may not suit the requirement all the time.
3. Traffic signal may hamper emergency services like ambulance, fire service, etc.

Social Impact: Road Safety is one of the most talked about issues in our country. Due to road accidents, many families lost their family members. Most of them were only earning person of their family. So, Road accidents can impact our society in many ways. According to statistics, 90 % of all accidents are the result of human error. In our country, traffic police can hardly be seen after evening at the intersection point. And statistics tell us that 40 % of all traffic accidents happen at intersections. But these problems can be solved by traffic lights. Traffic lights can be controlled both manually and systematically to allow them to be coordinated in real time to deal with changing traffic patterns. In many countries, 80% of the road accidents have been reduced by using traffic lights. So, less road accidents ensure less death counts on roads.

Components Short Description:

1. Breadboard: A board which is used for temporary circuit designing and prototyping.
2. Arduino UNO: It is an open-source microcontroller that can be integrated into a variety of electric projects.
3. Red, Yellow and Green LED Lights: A semiconductor light source that emits light when current flows through it.
4. Wire: It is one of the basic components of any circuit.
5. Arduino USB Cable: A specialized cable used to interface Arduino board with computer devices.
6. Power Source: simply it is the origin of incoming electricity.

Future Scope: If we can use machine learning algorithms or AI in this traffic light simulator, then this project can be very useful for our country. If we can add some sensors or apply some algorithms to traffic lights to tell them how to deal with emergency services or by checking the density of both lanes to make a decision then, this can be useful for us in the near future.

Workflow: