IN620 Embedded System

This project was inspired by my fascination of work vehicles especially police cars. Typical police cars have one pattern of flashing police lights when they are turned on. Which is used on any situation, from emergency run to just a random check-up. In this project however, I have come up with an idea of creating 3 modes of different patterns in which the police lights can switch to depending on the situation.

# Pattern 1

The first pattern is the generic pattern in which typical police lights flash on. Within 10 repetitions, the red LEDs turn on and off as the blue LEDs does the opposite. Currently, this pattern is used in emergencies, halting vehicles during road patrol, or during random police check-ups. But, in this project it will only be used during an emergency rush. This flashing pattern has high impact which suits the fast-paced siren during the emergency rush.

# Pattern 2

The second pattern is 10 repetitions of both red and blue LEDs flashing on and off simultaneously. It has less impact compared to the first pattern and flashes much slower. This pattern would be used during road patrol where police would pull over cars and it would compliment the slow blaring siren.

# Pattern 3

The third pattern is 10 repetitions of both individual red and blue LED lights flashing simultaneously from the outer end of the row to the middle and back. This pattern has lesser impact compared to the first two and would only be used during random police-check-ups/patrol.

# Hardware Justification

The outstanding equipment being used in this project is the red LED lights, blue LED lights, green and red push buttons which is used to capture the theme of police lights. The first pattern runs automatically upon turning on the Arduino, the second pattern runs when the red push button is pressed, and the third pattern runs when the green push button is pressed.

# Insights

A problem that I encountered while going through this project, was that I had run out of space on my breadboard piece to implement a third push button so when I pressed any of the push buttons it would run a pattern of flashing lights associated with it. Instead I had to run the first pattern of flashing lights as automatic while the other two patterns turn on when the respective push buttons are pressed.

The other problem is that, the patterns must run through the entire loop (10 repetitions) before it changes even after the push buttons have been pressed. This causes a “lag” between changes, which makes it seem that the button doesn’t work.

# References:

Codes used were taken from SIK guide provided for us to use. But implementation to build this project was an original idea.

* <https://learn.sparkfun.com/tutorials/sparkfun-inventors-kit-experiment-guide---v40/circuit-1a-blink-an-led>
* <https://learn.sparkfun.com/tutorials/sparkfun-inventors-kit-experiment-guide---v40/circuit-2b-digital-trumpet>