Executive Project Summary

- Original Design Problem

Our original problems that we needed to solve for our project were to create a bike safety light system that was contained within a robust enclosure, had multiple safety features, had turn signals that could turn off automatically, had brake lights that could increase in brightness and flashing speed as a full stop was approached, and was visible enough to vehicles at night. In addition, we also added the requirements to have the system be able to use solar power to charge and have the battery life last long. Overall, the goal was to help increase a bicyclist's visibility to other drivers to improve their safety using lights and signals similar to cars.

- Approach to Project

Our overall approach to the project was to try and break it down as best we could. We met often to make sure everyone was on the same page and we could bring up issues or ideas for the project. Our first phase was just theory crafting and bouncing ideas off each other. From there we started to create a plan. Along with creating the plan, we created a timeline, delegated work and created blocks for each member to tackle and look into. From there the project was individual work, looking into their respective blocks and making sure their block was possible. We would still meet up at least once a week to do a progress report as well as talk through problems and ideas for the project. These phases mentioned took the group up until around week 6-7. After that point we started to think about implementing all the parts together, how it would all fit, and housing for the components. This was the early implementation phase, where we would test blocks together such as getting the power supply to provide the correct voltage to the microcontroller. And testing that the microcontroller worked with the sensor and controlling the bulbs. As we got closer to the demonstration, the group spent more hours in the lab putting and implementing each part together. During the final phase it was all testing and documenting what we were testing.

- Key Lessons learned

Some key takeaways from this project that our group learned included doing extensive research on the kind of technologies we could use to implement our project and the limitations we needed to be aware of. We started off with a vague understanding of what we would need to create our system and built off of that as we went on with the project and learned of what was and wasn't possible. We also learned the importance of testing often and making sure we checked our work consistently to prevent any unintended issues. Our work would often be done in large chunks by ourselves before we came together to test blocks with each other. Smaller tests of the key components would have been more beneficial. A major takeaway from this project was also being able to balance time, scope, and resources. We as a team were not always able to meet together often, and we did not have the budget to buy components that would have been ideal but very expensive.

- Timeline