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**1. Title of Project:** LED motion sensor

**2. Description and graphical abstract:**

The project is about using an LED motion sensor so that the LED would light up when there is some sort of movement in the environment. I got this idea from a smart light bulb I have in my room that turns on automatically when I walked in. Using the ultrasonic sensor, I would use it to calculate the distance between my hand and the sensor. Using the calculated distance, I would display the distance on a digital display, or I could activate a fan to blow cool air when the ultrasonic sensor activates.

I do not currently have a diagram of the project yet.

**3. Details:**

I am interested in this project because I am excited to learn more about embedded systems and its real-life application with motion sensors. I thought it would a fun learning opportunity to learn more in this project. The main application of this LED motion sensor would be for the smart light bulbs that can detect motion outside for security reasons. A microcontroller is needed because I need to wire the circuit with the special pins on the Arduino Due so that I can run the Arduino program on the microcontroller. Some of the comparable projects/design in the internet are the self driving mini car using motion sensors to track its direction, smart garden, or temperature sensor. The comparable devices in the market are the self-opening sliding door, smart light bulbs that lights up the room as you walk in, and smart cars with build in smart technology that automatically brakes when pedestrians are in front of the car. Some of the main techniques that are used in this project are mostly hardware design, software design, and electronics. The hardware design and electronics would mostly for wiring and implementing the LED and digital display on the bread board. For software would focus more on the coding of my device. Since, I haven't finish with this project yet there is still much for me to learn, but for now I know the basic wiring to light up an LED and basic C++ code. I would demonstrate the functionality of my project in front of the class by displaying the device for everyone to see and explaining what my device does and how it is practical in the real world. Since, we are still in hard times because of Covid-19, so I would have to record a video to demonstrate it. I do not believe that this project will be selected as the best project of class, since my project can be seen a bit too simple and there many great students with greater and more complex ideas than mine.

**4. Tentative list of materials:**

- a. Wires
- b. Resistors

- c. LEDs
- d. An ultrasonic sensor
- e. A digital display
- f. A fan (If I decided to use a fan instead of the digital display for my project)
- g. A breadboard
- h. A motor (If I decided to use a fan instead of the digital display)
- i. Other items I might not remember currently that I might need for the project

**5. Milestones:**

- a. Order parts for the project
- b. Do a bit more research about my project and the tools I need
- c. Work on a design of the device for the project
- d. Work on the hardware part of the project such as wiring
- e. Work on the software part of the project such as coding
- f. Test to see if the device works
- g. Do a revision of the project if somethings don't work out
- h. Make a video describing my project
- i. Submit

**6. Timeline:**

- a. Order parts, 1 week
- b. Do a bit more research about my project and the tools I need, 3 days
- c. Work on a design of the device for the project, 5 days
- d. Work on the hardware part of the project such as wiring, 2 weeks
- e. Work on the software part of the project such as coding, 2 weeks
- f. Test to see if the device works, 3 days
- g. Do a of the project if somethings don't work out, 5 days
- h. Make a video describing my project, 3 days
- i. Submit, on the due date