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Project Statement

My project will be an automatic trash dispenser, with a purpose of having a hands free way for users to dispose of their garbage. This falls under the autonomous devices design area, and it aids users by not requiring them to have to touch garbage lids or covers when disposing of trash, while also keeping the trash covered so the smell wouldn't be an issue.

Initial Constraints and Specifications

- Must run "forever"
- When "dumping" certain colored LEDS must light up
- When not "dumping" different colored LEDS must light up
- Servo will move 180 degrees when dumping, then return back to 0 degrees
- User can start servo by waving hand in front of sensor
- Sensor will not take input while servo is running
- User must wave within a specified distance to start servo
- Servo must wait once at 180 degrees for a few seconds before resetting

Asks

The purpose of my project is to provide an autonomous device that allows for users to dispose of their trash without having to touch any part of the trash can.

Inputs will include an ultrasonic sensor input that will read if a user has waved their hand in front of the sensor or not from a certain distance.

Outputs will include a servo motor that will rotate based on user input, and LEDs that will light up depending on the state of the program.

Constraints include the distance that a user must wave in front of the ultrasonic sensor from and the degree that the servo must rotate to and from (180 degrees to dump, 0 degrees as a resting place).

Preliminary BOM

- LEDs
    - For displaying the state of the trash can
- Jumper Wires
    - For making connections between parts
- Ultrasonic Sensor
    - For the user input
- Servo Motor
    - For output of changing state of the trash can
- Nucleo
    - For making connections between the parts and the program
- Solderless Breadboard
    - For LEDs