Jonathan Garcia-Mallen's Project Checkoff Checklist

Commitment

Robot goes forward for a time determined in seconds by the switches on the Nexys 4. It avoids obstacles in the way using its IR senors and a proporional controller. Once the time period is done, it stops. The forward motion having been recorded in memory, the vehicle then travels in reverse.

Modules:

- Task manager: Switches between forward/rewind controllers, stores data in memory
- Forward controller: Obstacle detection and avoidance
- Rewind Controller: Pulls data from memory to drive robot backwards
- PWM Converter: maps command from controllers to a PWM wave for the servos

Goal

Robot can perform all of the above, as well as follow the solid walls in the lab.

- Task manager: Switch between the three modes using buttons on the Nexys 4. Switching to wall_follow mode may involve turning the sensor array to face the side of the wall, using a third motor.
- Wall follow controller. Another proportional controller to maintain a distance from the wall.

Strech

1. Use sound to switch between modes: e.g. 440Hz = forward, 493Hz = rewind, 523Hz = wall follow.
    - Requires microphone and some lab-5 like signal processing
2. PID control. Not that hard; would use register memory.
3. Add camera and follow lines. I doubt I'll get here, but this is what interests me the most.