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SE101 Project Proposal

What it Does

This project will be a reaction-time based game controlled by an Arduino. There will be a display screen to tell the player what to do. For example, the screen could display "Red" and the player must press the button when the red light comes on. The player would have a very limited time to complete each command and if the player fails to complete it within the given time or completes an incorrect task, they will lose a life. Once three lives are lost the display will show a game over screen and the number of tasks the player completed as the score.

Once the base game is finished, the following additions will be considered: Use of button and joystick to determine the difficulty of the game, use of a buzzer to indicate when a life is lost, use of other modules to make other tasks for the player to complete.

Major Software Components

- Function used to determine what command the player is the execute
- Function used to display the command
- Function used to track the time the player is allowed and their lives
- Function used to execute the command (Light up the lights of differing colors)
- Functions used to register human input (Button press, Joystick, etc.)

Prototype Plan

The prototype will be an evolutionary and horizontal prototype.

Since the project involves multiple different aspects all working together (Display, human input, timer, etc.) and since there will be two people working on this project, the integration will be the most important aspect of this project, therefore a horizontal prototype is the best. Evolutionary prototype will be best because we know the general idea of the project, but the specific requirements are unclear. More and more things will be added to the game as the development continues so an evolutionary and horizontal prototype will be perfect.

Hardware Needed

• Elegoo UNO R3 Controller Board • LCD 1602 Module (display) • Power Supply Module • Joystick Module	• 830 Tie-Points Breadboard • Button • Red, Yellow, Blue, Green, RGB LED lights • Active Buzzer

Anticipated Challenges

- Integration of many different hardware and integration of parts written by two different programmers
- Learning Arduino. Neither of us have any experiences with Arduino
- Getting precise time to measure the reaction time
- Making the physical device intuitive and easy to use