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PY371, Project Proposal

## Interactive MAKE-24 game

### Concept

The project will use Arduino Microcontroller to simulate interactive MAKE-24 game. Using the 4 seven-segment displaying LED to randomly generated 4 numbers between 1 and 9, the player will be asked to complete the arithmetic using these 4 numbers and the operations +, -, x, /.

Firstly, the player will use 4 pushbutton switches to select 2 of 4 numbers from the 4 displaying LEDs, and asked to choose the operations. Then those 2 numbers will disappear, showing the intermediate result in one of the displaying LEDs. Repeatedly, the player will be same arithmetic (Choosing 2 numbers from the remaining 3, getting the next intermediate result, then finishing the last 2 to obtain the final result). The player will win the round if the displaying LED shows number 24 and there are no numbers left, otherwise the game is over.

Extra: There will be timer display on another one seven-segment displaying LED and the player have to finish the round before the timer goes to 0. First will be 30 seconds. If the player is able to complete the first round, the interactive game will ask player to continue with reduced timer. The timer will go 30, 25, 20, 15, and 10 for the rest of the rounds until the game is over.

### Design

The 4 displaying LEDs placing next to each other will have each 4 random number of their own, with the 4 Blue LEDs attached under the displaying LEDs. First all the LEDs will light off. Then the player will first push the 2 buttons to select the numbers, and the blue light will turn on indicating the choices. After pushing the operator, the lights will turn off, the number on the leftmost rightmost disappear, showing the intermediate result on the left displaying LED. If the player get 24 without any number left before the timer runs out, the green right will turn on indicating the win and then continue with less timer, otherwise the red indicating the loss and game over.

### Parts Needed

1. Arduino Microcontroller
2. 4 breadboards
3. 8 pushbutton switches. 4 for selecting numbers on the displaying LED, 4 for selecting arithmetic operations.
4. 5 seven-segment displaying LEDs. 4 for displaying the 4 numbers and for the player to interact, 1 for the timer.
5. 1 Green and 1 Red LEDs to show the player the result (win or lose).
6. 4 Blue LEDs for showing the number of choice
7. Several wires