Project Proposal - Match Three Game

Describe your project. What does it do?

Our project is a match-three game similar to Candy Crush in which the user matches three or more of the same elements in order to score points. The user will be able to control the board through a LCD touchscreen or buttons to switch elements.

The major software components of your project

Our software will consist of a graphical user interface. Shapes and words will be displayed on an TFT LCD screen, or a dot matrix. The screen will continuously take in input and the program will scan the array of elements after every move made by the user. It will randomize new elements and move all elements in the array down after the user has made a match. Our code will be implemented on the Arduino. More complex features may be added if time permits, such as multiple combos, combo chains, an instruction manual, multiple levels, time limits, point limits, etc.

Hardware required

- Arduino
- Display screen
  - TFT LCD: SD card to load graphics onto Arduino
  - TFT LCD touchscreen
  - Dot matrix
- Resistor (220 ohms)
- Shield
- Jumper cables
- Breadboard
- Controller to allow players to select and switch candies

Prototype plan:

Our prototype will be an evolutionary prototype - it will contain all the basic components of our final product, with less advanced graphics and fewer special features. The basic structure of our program is the following:

The main function will call a function to get user input on which elements are being shifted. This function then calls another function which checks if the input is valid, which is to say if three adjacent elements match. If the input is invalid, the function to get user input repeats until it acquires valid input. If the input is valid, the function will return the positions of the elements that are matched to the main function. The main function then calls another function to delete all current elements in these positions, and calls another function to randomly generate elements to fill the vacancies left by the deleted elements. The function to check for matching elements is called again, and the process repeats until there are no more matching elements. Finally, the entire process recommences with new user input, and repeats until the termination of the game.

Challenges you anticipate

Since the code is repeatedly taking in input from the screen and checking the array for matches, one of our main challenges will be making our code efficient so as to not interfere with gameplay. Another challenge for us may be interpreting touch screen input and displaying graphics, since we are all relatively new to hardware and game design.