Extended Project Proposal

EE2361

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Core Concept: We plan to use the PIC24 to interface with an NHD-C12864LZ-FSW-FBW-3V3 LCD Display. We will design and run the game Tetris from scratch specifically for use with the PIC 24 and the display. The display is 128 by 64 pixels, and each Tetris piece needs to be made out of four blocks, which works out perfectly to have each block be 8 by 8 pixels. This means that the game board will be 8 by 16 blocks. The game will be controlled by 4 buttons, one each for left, right, down, and spin. Tetris pieces will be randomly selected from a predefined library of pieces, and the game will slowly accelerate to increase the difficulty as time goes on.

Core Components:

1. NHD-C12864LZ-FSW-FBW-3V3 LCD Display
   https://www.digikey.com/en/products/detail/newhaven-display-intl/NHD-C12864LZ-FSW-FBW-3V3/2625201

2. Nine 1.0uF (one micro farad) capacitors C333C105K5R5TA
   https://www.digikey.com/en/products/detail/kemet/C333C105K5R5TA/6562326

   These capacitors are specified in the diagram for the LCD display.

3. Four tactile switches in different colors 1-1825910-0
   https://www.digikey.com/en/products/detail/te-connectivity-alcoswitch-switches/1-1825910-0/1632538

   Note! I wanted to use the same switches that came in the EE2361 lab kit but I couldn't find them on Digikey. If those tactile switches are available, we'd like to use them. One blue, one red, and two green. The different colors will make it easier to tell which action is being taken (move left, right, down, or spin). If that option is not available, then four of the switches above will do.

Breakdown of roles by task:
(This is a rough outline and we will probably all collaborate on all the parts)

1. Hardware setup –
   a. Circuit diagram
   b. I/O pin mapping
   c. LCD setup
2. Software setup –
   a. Write commands for the LCD
   b. Handle user input

    c. Timing
3. Game logic – Jacob Sprafka
    a. Main loop
    b. Tetromino library
    c. Scoring
    d. Drawing game field to LCD