

LAGUNA STATE POLYTECHNIC UNIVERSITY
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**Stack Wars: A Two-Player Competitive Stack Game
Built on Arduino**

FINAL REQUIREMENT FOR CPE14 - MICROPROCESSORS

SUBMITTED TO:

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Introduction

The 2-player stacker block is an exciting and competitive game that challenges players' strength in terms of timing, focus, and coordination. In this game, two players simultaneously stack moving blocks as high as possible. Each block must be perfectly aligned with the one underneath. Any part that overhangs is cut off making the game harder to match. The goal is to stack the blocks all the way to the top of the display dot matrix or to beat the opponent by first finishing the stacked tower. With simple controls and increasingly difficult levels, the 2 player stacker block is a test and precision of reflexes that encourages friendly rivalry and fast-paced enjoyment.

This arcade stacker game using an Arduino microcontroller offers hands-on experience in building an engaging real-time electronic game. The stacker game challenges players to align moving blocks by clicking the button with timing, stacking them progressively makes it increasingly difficult. The project not only demonstrates the integration for hardware and software but it also provides a foundation for understanding how arcade-style games operate at low level. Making it ideal for students and hobbyists interested in electronic games for entertainment.

Objectives

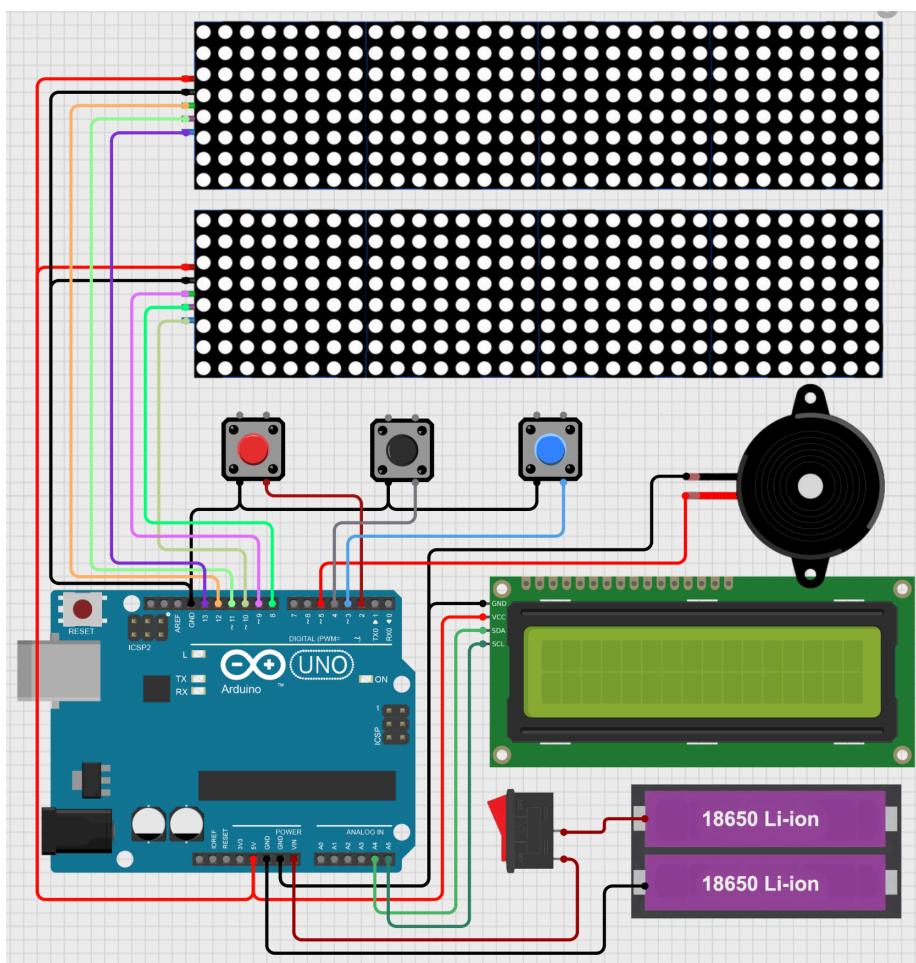
- Design and make a two player stacker game using Arduino Microcontroller.
- Implement a responsive game with visual feedback that simulates a real arcade stacker game.

Materials

- Arduino Uno
- 2x MAX7219 Microcontroller 4-in-1 Display Dot Matrix Module
- Liquid Crystal Display 16x2 I2C
- 3x Tact Switches (Blue, Black and Red)

- 5 volts 2A Power Supply Adaptor
- 2x 18650 Li-ion Battery
- Passive Buzzer
- Battery Holder
- Rocker Switch
- Jumper Wires
- Mini Breadboard
- Plywood
- Wood Glue
- Sticker paper
- Paint
- Paint brush
- Sticks
- Folder

Schematic (Circuit Diagram)



Observation

The 2 player stack block challenges the player to be fast-hand and competitive. The two matrices foster a sense of direct competition. There are 8 levels of difficulty each varies on the speed of the moving stack block, 1 as the slowest and 8 as the fastest. These levels of difficulties added to the tension and excitement. Players can play simultaneously, trying to align the moving blocks and stack it as high as possible. Each player is given a vertical track along which blocks move horizontally, the winning condition is when the player stacks the block higher than the opponent.

This arcade game is designed for having smooth animations, playful sound effects, strategic level in every difficulty, and defeat your opponent. The concept is simple which makes your brain improve timing and focus. Psychological elements are present such as stress, adrenaline, excitement which makes the game more fun to play especially to the both players that are close to reaching the top while the other player makes a mistake. Which makes him/her stop the time of playing the 2 player stacker block. By pressing the reset button the game is ready to be played again.

Conclusion

The 2 player stacker game project shows how building the hardware and the software with Arduino can result in a fun and engaging arcade experience. This project taught students how to create circuits together, write programs, and develop games. The game tested each player's timing, quick reactions, and hand-eye coordination, making it both educational and enjoyable. Using dot matrix screens, buttons you can press, and quick responses made players feel like they were really in an arcade. All in all, the project did what it set out to do: it copied a real-time stacking game and taught a lot about how to make electronic games from the ground up. This hands-on project gets people to think , solve problems, and become more interested in electronics and systems built into devices

Documentation

