Tic Tac Toe and Connect 4 Simulator

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Chapter 1

Introduction

The project is a simulator for classical games Tic Tac Toe and Connect 4. The hardware includes the Arduino UNO board, numeric keypad, and an 8x8 RGB led matrix (not included in the kit).

1.1 Tic Tac Toe

A classical game for children in which two players challenge each other to fill a 3x3 grid, with the goal to place 3 symbols in a row, a column or a diagonal. The game is not fair, meaning that the second player can at most draw if both players never make an error.

1.2 Connect 4

Kind of an extended version of TTT, C4 is a game in which two players try to put 4 symbols in a row, column or diagonal. The grid is a 6x7 matrix in which moves can only be made from the bottom row to the top. C4 is a not-fair first-player-win game too, meaning that the first player can force a victory if they play perfectly.

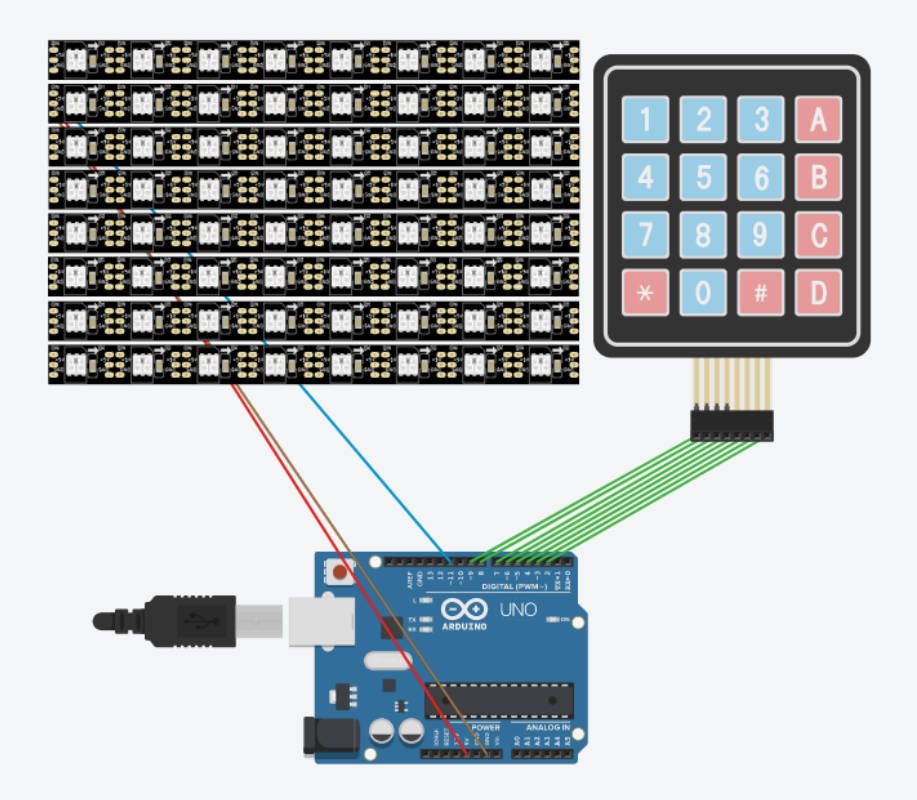
Chapter 2

Hardware

The keypad is connected to the board with 8 pins, from 2 to 9. The matrix is connected with only one data pin, on input 11, and with the 5v power pin and ground.

2.1 Schema

The project structure is the following:



2.2 Packaging

The package is made out of an old TIM modem, without internal components, in which the Arduino board and cables are put. There is enough internal room for a battery, in case a standalone project is needed. The package is easy to open and each component is replaceable.

Chapter 3

Gameplay

The execution of the program is the following:

- the matrix will show instructions to select either TTT or C4 game
- to select a game, press the corresponding number on the keypad
- after game starts, the two players will play one turn each
- players have different colors that are printed on the grid
- TTT moves are made by selecting numbers 1-9 as if they were the grid itself
- C4 moves are made by selecting numbers 1-7 corresponding to a column