# SOKOBAN

< The source code is not publicly available.To view source code please contact me directly for access permissions. >

## Requirements:

Number of Players (>= 1 Player ; the game will exit upon entering 0 as the num of players) ; Playing Time (No Time Limit);

> *The game is a classic rendition of the original Sokoban. In this game, the player pushes a box into the correct position, also known as the target.*

**Objective:** The player is confined to the LED board and may move horizontally or vertically onto empty squares (never through walls or boxes) and try to get the boxes to specific locations.

# Components:
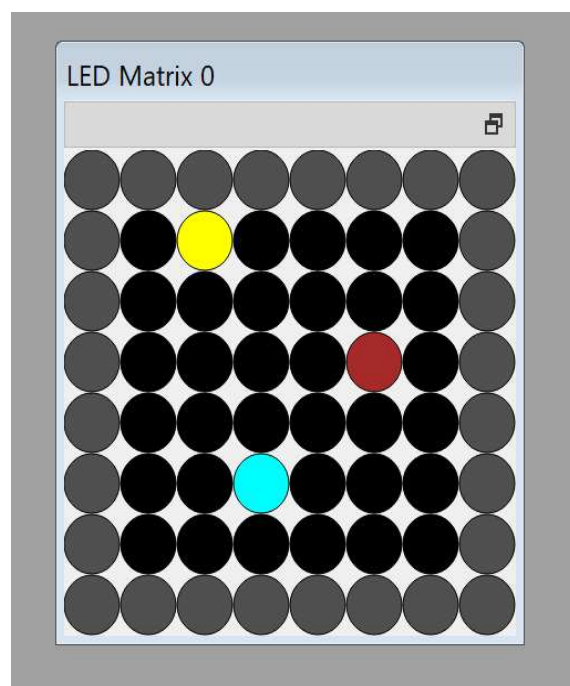


- **Walls:** The gray circles represent walls within the game. The walls form the fixed boundaries of the level that neither the character nor the box can pass through.
- **Character:** The blue circle symbolizes the character that the player controls. This is the entity that can move around the level and push the box.
- **Target:**The yellow circle marks the target location where the box must be placed in order to solve the puzzle.
- **Box::** The red circle depicts the box that the character must push onto the target location. It can only be pushed, not pulled, and cannot pass through walls.
- **Controls:** The players must use the **D-Pad** to control the movement of the character and the box.

⬆    = move up

⬇    = move down

➡    =  move right

⬅    = move left

# Setup

To set up the game:

- ○ Open the ripes,.exe file and click **Load program** from the **File** menu which is on the leftmost corner. Now open the *project.s* file and make sure to select **Source file** while loading the program.
- ○ Now, select the **I/O** tab and double-click on the **"LED Matrix"** device to get an LED matrix if there is not already one. To the right, there should be a panel **"LED Matrix 0"** with parameters "Height", "Width", and "Size". Set the height and width to 8 and 8. Set the size to a value that makes it easy for you to distinguish the LEDs.
- ○ Next, double-click on the **"D-Pad"** device to get a d-pad if there is not already one. No values need to be set here. After setting up the "LED Matrix" and "D-Pad" your I/O tab should look like this:
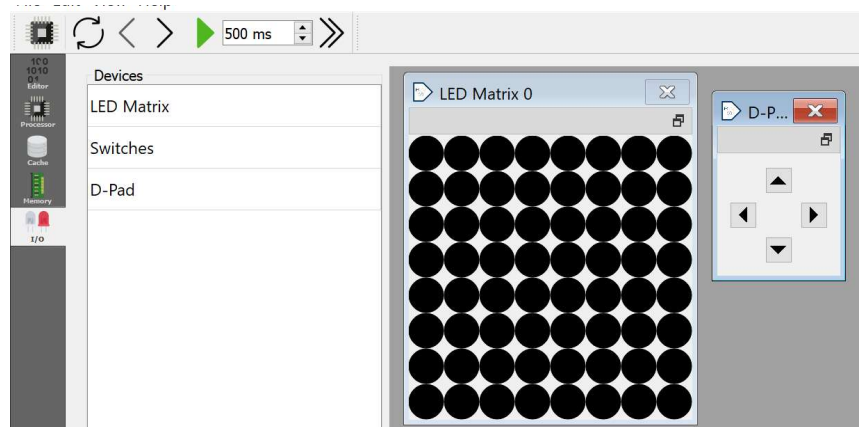


(Here the height and width is set to 8  and the size is set to 50)

- ○ Now, click the resize button located at the top-right corner of the **"LED Matrix 0"** window (not the panel) to move the LED screen across different tabs. Perform the same action for the **"D-Pad 0"** window. You can also achieve this by double-clicking the space below the title bar.
- ○ Finally, go back to the **Editor** tab and use fast execution (the **">>"** symbol) to make sure the program runs quickly enough.
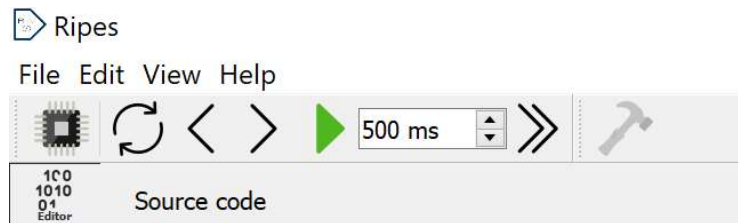
# How to Play

An overview of how the game works:

The game offers a multiplayer option, played in a series of rounds, where each player tackles the same puzzle. At the start of each game, the console prompts the user to enter the number of players. After entering the number, players should see the corresponding LEDs turned on.

## Start of a Round:

Before each round,the console displays a message to indicate which player's turn it is.

## Description of Player Actions

➢ **Movement:**

- As mentioned above,the objective of this game is to push the box to the designated target locations. However,the player can only push the box, not pull, and the box cannot be pushed through walls. The player can only move up, down, left, or right within the confines of the walls using D-Pad Controls. A move is only valid if it does not place the character or the box into the walls.If a move is not valid, the game does not penalize the player or end. Instead, the game continues normally, waiting for the next valid input from the player.

➢ **Restart:**

- Often, players will find themselves in positions where the puzzle cannot be completed, such as when a box is pushed into a corner. In such cases, the game provides a restart option. To maintain fairness, any moves made in the unfinished round are added to the new round's count. Once the box is in an edge position, players will be prompted to signal their desire to restart by entering '0' or '1' in the console, indicating whether they wish to restart or exit the game, respectively.
- Additionally, if players attempt to move into the walls more than four times, it will be interpreted as a request to restart. Subsequently, players will be prompted to confirm whether they want to restart or continue. This ensures that players who mistakenly hit the wall too often still have the option to proceed with their current game.

## Winning/End of a Round

After successfully placing the box into the target, the player will receive a congratulatory message.The players can see how many moves it took to put the box in the target. They can also see the record for the lowest number of moves achieved in past rounds.

# End of the Game

After the rounds are completed, a scoreboard will appear on the console, displaying the players' scores in ascending order. The player who solved the puzzle in the fewest number of moves is considered the winner.. The players will then be prompted to enter '1' if they wish to play again or '0' to exit the game. If the players choose to continue by entering '1', they will be asked to input the number of players for the new game, and subsequently, a new set of puzzles will be displayed on the LEDs.