# Sokoban: The Game

User Documentation

Intr3pid64

# Sokoban

**Objective:** Players will move a box across the floor of a warehouse to a target. The player can move the box around by pushing it with their character and they will use their problem-solving skills to complete the puzzle.

## Set-up:

To begin, open Ripes and load in the specified file by navigating to: File -> Load program and clicking the Source file option and finding the specified file with the game and selecting it. Once the file is loaded, navigate to the left-hand menu, and select the I/O tab. Double-click on the "LED Matrix" found under "Devices" and navigate to the right-hand side to find a menu named "LED Matrix 0." Within the parameter's menu, change the height value to 8 and the length value to 8 by clicking on the values. Additionally, you may change the size of the circles to whatever is easiest to see (recommended size 50). If the matrix is cropped inside the tab, move the mouse cursor to the bottom right corner of the tab and dragging the tab to a size where the whole matrix can be seen.

Next, double click on "D-pad" to see the D-pad on the screen. It is recommended to "pop" the matrix and D-pad out by clicking on the popping window icon that is can be found in the top right corner of their respective tabs (figure 1). Finally, select the processor icon (figure 2) in the top left of the screen and click on the Single-cycle processor option and the OK button. Navigate to the editor to start the game. More specifically click the "fast execute" button (figure 3). You are ready to start playing the game.
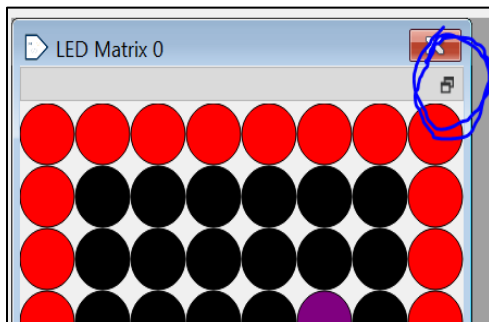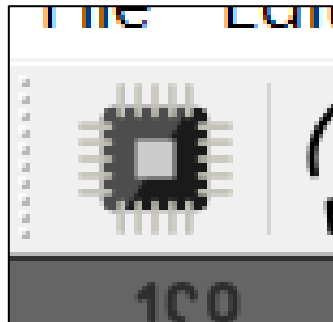


Figure 1. Popping Window Icon
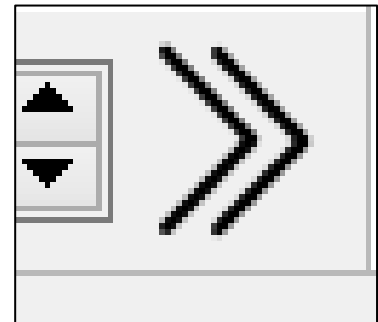


Figure 2. Processor Icon



Figure 3. Fast execute

## Components:

- A D-pad which has buttons on it that can be clicked on to move the character around the field. Every button is represented by an arrow that can be clicked on to move the character in the specified direction (figure 5).

- The LED matrix represents the warehouse the player and all items reside in. The LED matrix is an 8x8 matrix with circles representing every place an item can spawn and the player can move (figure 4).

- The character is represented by a blue circle on the matrix. The player can move the character around the matrix by clicking on the D-pad buttons (figure 4).

- The box is represented by a purple circle on the matrix. The character can move the box around the matrix by clicking on a movement button that is in the same direction of the box, while the box is a circle beside the character (figure 4).

- The target is represented by a green circle on the matrix. This is where the player should be pushing the box towards to win the game. Once the box is on the same circle as the target, the game will end (figure 4).

- Walls which represent the edge of the warehouse. The player cannot move through the walls. The walls are represented by red circles on the LED matrix (figure 4).

- The console is a text-based interface where the player can see important messages from the game in real time. This includes messages based on the movement and actions the player decides to take during the game (figure 6).
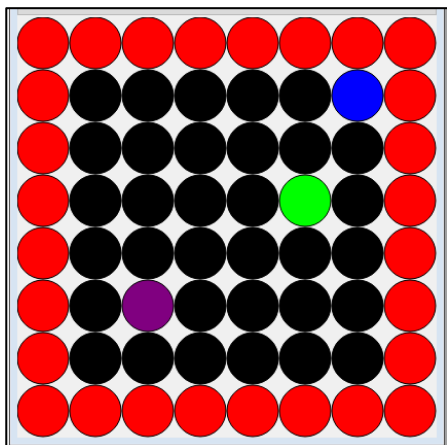


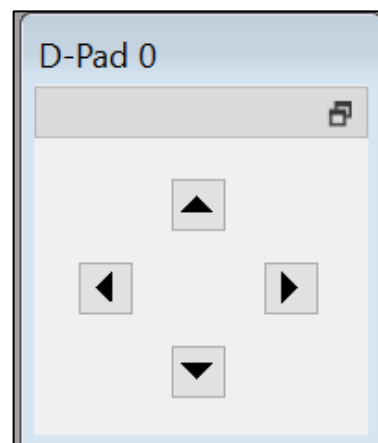*Figure 4: LED matrix with character, box, walls, and target*

*Figure 5: D-pad for character movement*

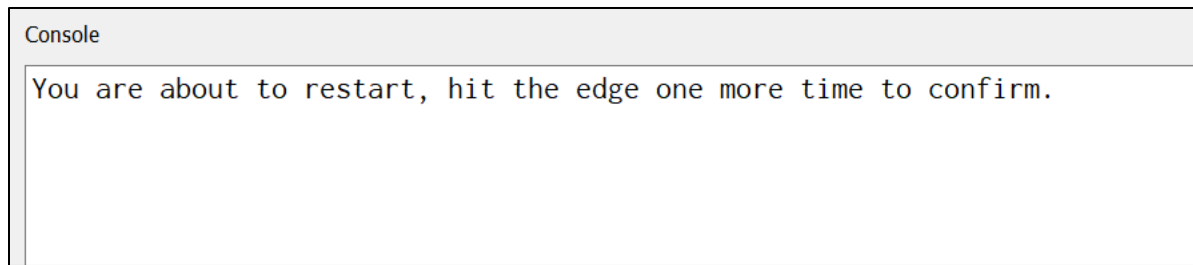| Console |
| --- |
| You are about to restart, hit the edge one more time to confirm. |

*Figure 6: Console for player to get messages about the game in real time. Message above is when the character hits the top wall once to restart, and the game asks the player to confirm on the decision.*

## Gameplay:

### Introduction
You will see the LED matrix light up, with the walls being introduced and the player, box, and target being placed somewhere random on the matrix. You may use the D-pad and click on the buttons to make the character move in a specified direction. If you move in a specific direction, and the box is in front of the character when the player clicks a D-pad button, the box and player will move together.

### Movement
However, the walls around the edge restrict character movement. If a player clicks on the D-pad to move the character in a specific direction and a circle representing a wall is in front of the characters circle, then the character does not move, and a message will be displayed in the console (figure 7). More specifically, the message will say, "You cannot move in this direction" (figure 8). Similarly, if the player pushes the box ahead one circle in a certain direction and a wall resides at the circle, then there would be no movement and the console would say the same statement, "You cannot move in this direction." The decision will be up to the player on how to proceed forward, whether it is to continue solving the puzzle or manually restart the game.
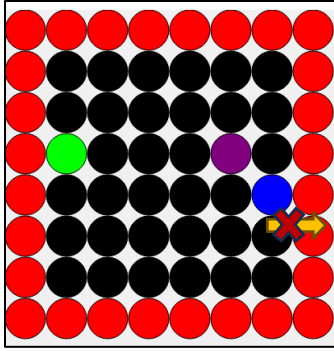
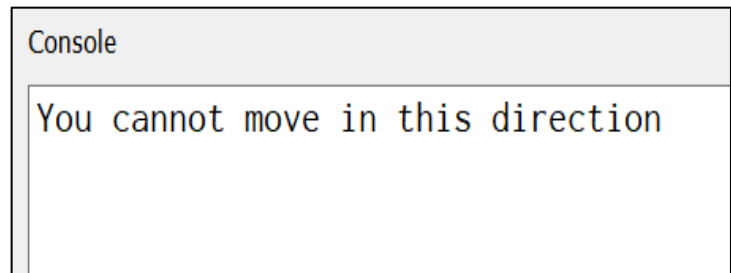*Figure 7: Player cannot move in right-direction (blue circle next to the red wall on right)*    *Figure 8: Message for no move in a specific direction*

## Restarting

There is an option to restart a game, which would put the character, box, and target in a new location on the matrix. If the character moves up into any parts of the upper wall (any circles representing the top wall), the movement will be restricted, but a message will show in the console saying, "You are about to restart, hit the edge again one more time to confirm" (figure 6). This prompt tells the player if they move the character the same "up" direction into the wall, then the game will restart (figure 9). Clicking any other button on the D-pad and moving the character any other direction will reset the counter and the player would need to move into the upper wall twice again in a row to restart.
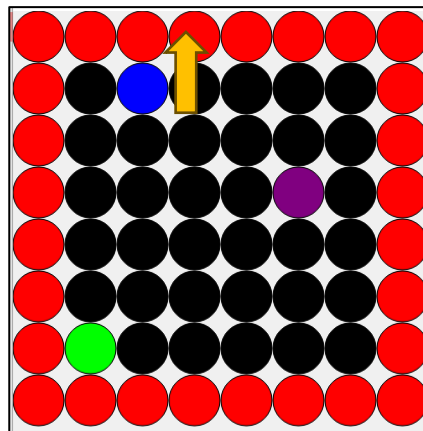


*Figure 9. Example of character in correct position to restart, with clicking the up arrow on the D-pad.*

The player is allowed to move over the circle that represents the target. If the character is on the same circle as the target, the character color will take priority and be shown on the matrix (figure 10). Once the character is moved off the target circle, the target will be shown again. Finally, once the box is on the same circle as the target, the console will say, "You have won, the box is on the target!" The game would then restart with the character, box and target appearing in different circles on the matrix.
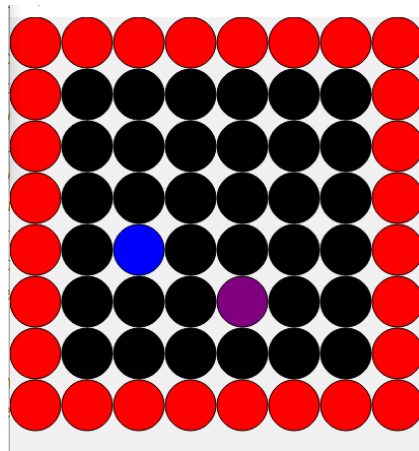


*Figure 10. Character dot over the target dot (blue over green)*

## Trouble Shooting:

If a player restarts the game through either beating the puzzle or moving into the upper wall twice, and the matrix has all its circles black, then stop the execution. This is done by clicking on the fast execution button found on the top toolbar and clicking the "reset the simulator" button which is represented by two revolving arrows (Figure 11). Finally pressing the fast execution button will restart the game.
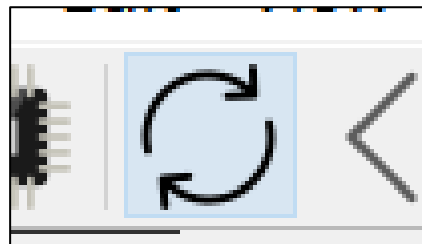


Figure 11. Reset the simulator button.