

“Simon” Game Documentation

Requirements: Number of Players (1 Player)

Simon is a memory game that tests the player’s ability to remember a sequence of flashing LEDs. This version of the game has four LEDs that light up in different colours. When the game begins, the program lights up the LEDs in a randomized sequence. The goal of the player is to memorize this sequence and enter the sequence in the same order by using the pads. If the player can enter the sequence accurately, the player advances to the next level with a higher difficulty. If the player fails, they can repeat the level or simply exit the game.

Components

- Ripes.exe must be downloaded.
- The file that includes game’s code must be downloaded.

Setup

After launching Ripes, the user can load the game from the top left corner by clicking at “Load Program” given under the “File” section.

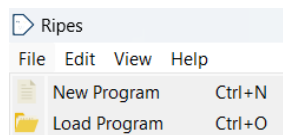


Figure 1

Then, the game files should be chosen and the “Source file” option must be clicked.

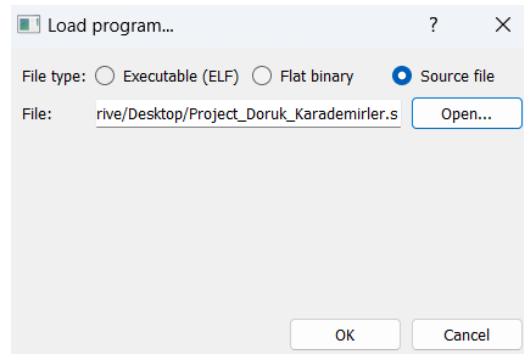


Figure 2

After clicking “OK,” the game should be loaded into the editor.

Before the player starts running the code, they must configure the input and output devices. This can be done via clicking the I/O tab given in the left column of the application.

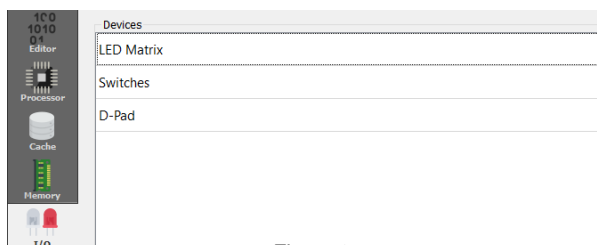


Figure 3

Then, the user must double-click on the "LED Matrix" device to get an LED matrix if there is not already one. The dimensions of the panel can be set to fit the game's requirements by adjusting the "Height" and "Width" parameters to 2 from the "LED Matrix 0" panel located on the right side of the screen. Finally, the "Size" parameter can be adjusted to ensure that the LEDs are distinguishable by setting it to an appropriate value.

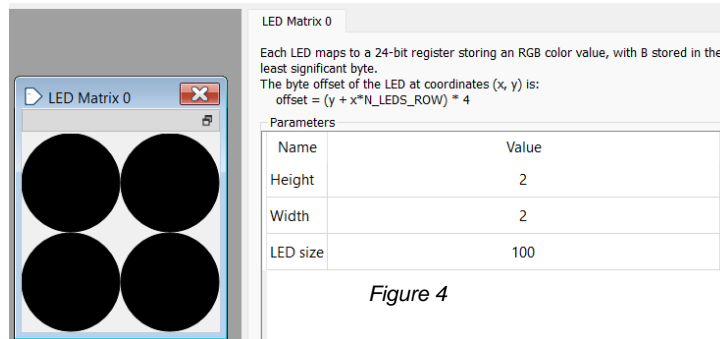


Figure 4

Additionally, the player must double-click on the "D-Pad" device to get a d-pad if there is not already one. The "D-Pad" is later going to be used for taking inputs from the player.



Figure 5, The D-Pad

To make sure the program runs quickly enough, the user must choose a single-cycle processor from the processor given in the top bar of the application.

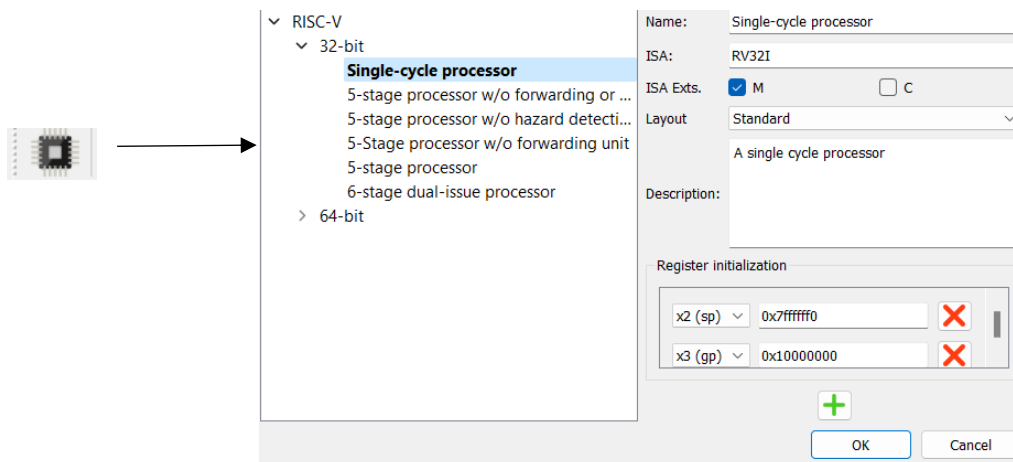


Figure 6

Finally, to run the game, the user must use the fast execution (the ">>" symbol).



Figure 7

How to Play

When the fast execution button is clicked, the LED lights will start to light up one by one, in a randomized order. The game will start from level 1, where only 4 LEDs will light up consecutively. Once the first LED lights up, the player should try to remember its place correctly. Then, the player should watch carefully for the rest of the LEDs and not forget about the sequence of the previous ones. After the LEDs light up enough times to display the whole sequence, the console (located at the bottom of the editor section on the screen) will print "You can start entering your answer." Then, the player should try to enter the sequence in the same order by using the D-Pad.

To use the D-Pad correctly, the player must consider the following image, where the key mappings from the D-Pad to the LED Matrix, with the unique colors of each LED, is shown:



Figure 8

Additionally, each time the player presses a D-Pad button, the corresponding LED flashes so that the player can make sure that the input is taken. For instance, if the user presses the ">" button and the answer is correct, the blue LED flashes. However, if the answer is wrong, the whole matrix is lighted up in red, which is explained in "Losing the Game" section.

Winning the Game

If the player can successfully enter the answer the whole matrix will light up in green one by one, and the console will print "You Won!".

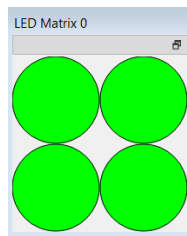


Figure 9

After successfully completing the level, if the player chooses to play again, the game's difficulty will increase. Specifically, the sequence's length will increase by one and the pause time between the lights will decrease, resulting in a faster game pace.

Losing the Game

If the player enters makes a mistake when entering the inputs, the matrix will light up in red and the console will print “You Lost :(”.

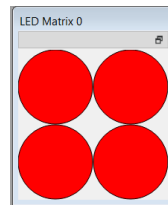


Figure 10

Repeating the Game

If the player wishes to play again, they must respond to the “Want to play again? '1' for yes, '0' for no!” question that appears at the end of each game. The user can respond by using the console that is found at the bottom of the editor section on the screen.

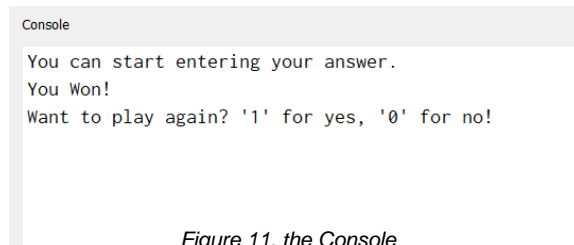


Figure 11, the Console

If the player responds to the question with “0,” the program is terminated. However, if the player responds with “1,” there are two possible scenarios:

- If the user has successfully completed the current level, the new level will begin, and the difficulty will increase as described in the “Level System.”
- If the user has failed the current level, the same level will be repeated. In other words, the sequence length and the game pace will stay the same, giving the player another try in the level.

If the user responds to the question with something other than “1” or “0”, the console will display “Invalid input” and ask the player to enter the response again.

Level System

The players can track their progress from the console since the current level is printed at the beginning of each round.

-Game Pace

As the user progresses through each level, the sequences become increasingly longer and the LEDs flash at a quicker pace. There are a total of 8 speed levels, with Level 1 having a delay of 500 milliseconds between each light. Upon successfully completing a level, the delay time

decreases by 50 milliseconds, resulting in faster flashing lights. For instance, Level 2 would have a delay of 450 milliseconds.

The game reaches its maximum speed at Level 8, where the delay between each light is 150 milliseconds. The speed limit of 150 milliseconds is in place to avoid any problems that may arise from LEDs failing to light up due to excessively short delay values.

After the maximum game pace is reached, only the sequence length is being increased to increment the difficulty.