Sokoban Assembly

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Overview

Sokoban Assembly is a reimagining of the puzzle game *Sokoban*, made entirely within Assembly.

In Sokoban, the player is set within an enclosed shape and is tasked to push a box onto a target. The player can only move within the four cardinal directions: Up, Down, Left, and Right. Moreover, the player can only move the box by pushing it in the direction the player moves towards. For instance, if the player wants to push the box up, the player must maneuver their character below the box and move up.

This user guide will help you start the game and teach you everything you need to know to become a Sokoban master!

Note: In order for you to begin playing, the game requires you to have a computer, a keyboard, a mouse, and a working browser.

Getting Started

Before you can get to playing, we must ensure that you can correctly run the code by following the steps below.

1. Open CPULator - https://cpulator.01xz.net/?sys=rv32-spim on a browser of your choice. Simply load the link into your browser's search bar and press enter.

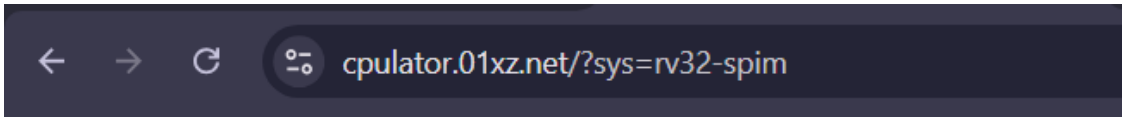

Figure 1: Google search bar with the link to CPULator

2. Navigate to the middle panel and select the Editor tab. You can click to select the tab or type the keyboard shortcut "Ctrl-E"

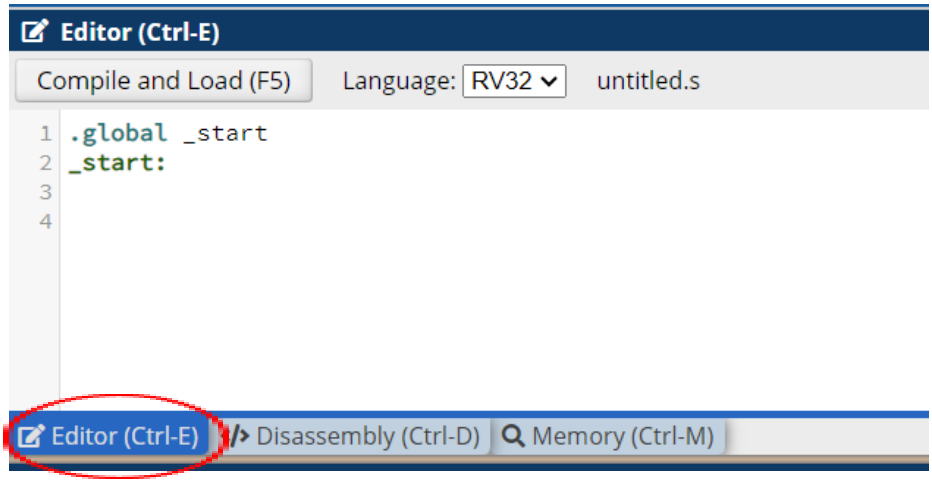

Figure 2: The editor panel with the editor tab highlighted.

3. Copy and paste the Sokoban Assembly code into the middle pane.

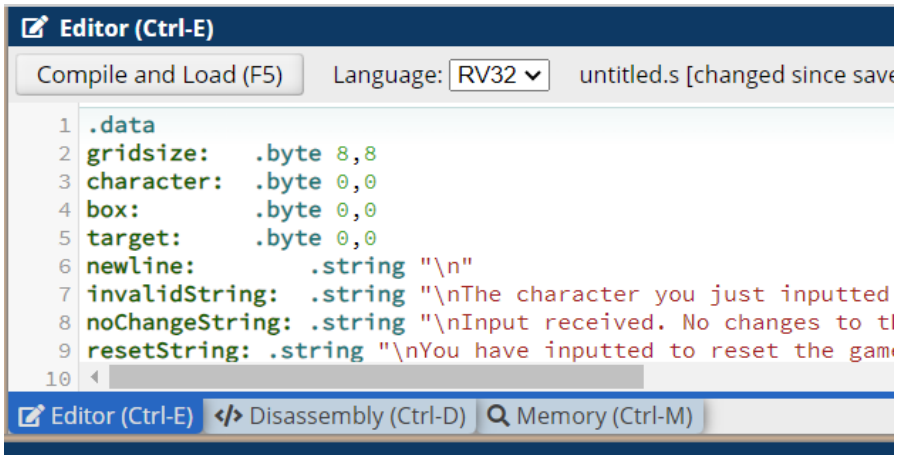

Figure 3: Editor panel with the Sokoban Assembly code.

4. Click on the "Compile and Load" button. A message will appear in the bottommost pane notifying you that the compile has succeeded

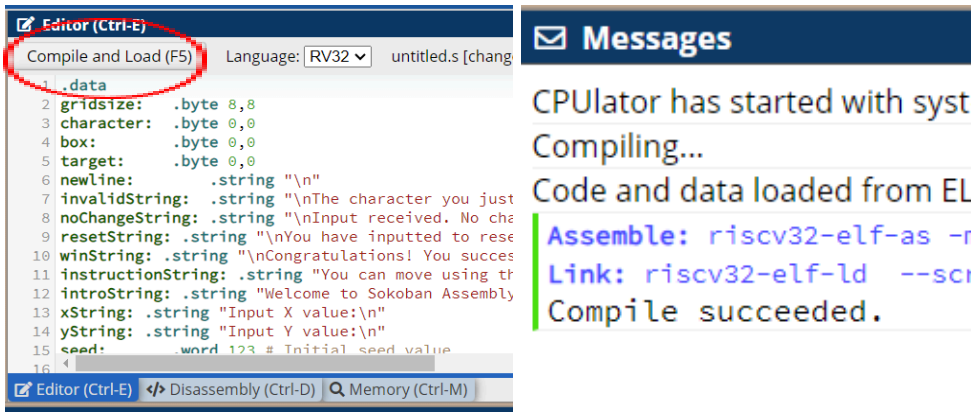

Figure 4: On the left, the editor panel with the "Compile and Load" button highlighted. On the right, the message panel showcasing the successful compilation.

5. Click on the “Continue” button at the very top of the page.

Figure 5: Editor panel with the Sokoban Assembly code.

You will know you have followed the steps correctly if the top bar turns green and starting text is shown inside the terminal panel.

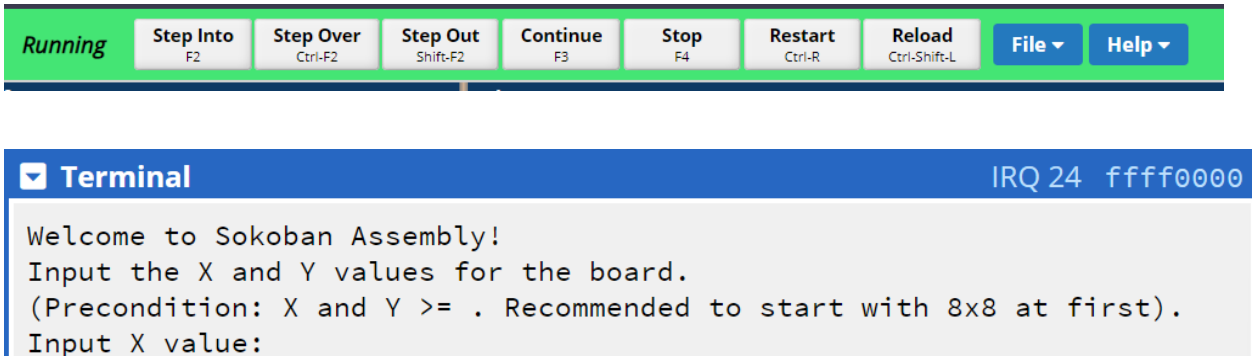

Figure 6: On the top, the top bar appears green. On the bottom, the terminal panel is populated with the starting text for the game.

Starting the Game:

To start the game, click the *Continue* button at the top of the page.

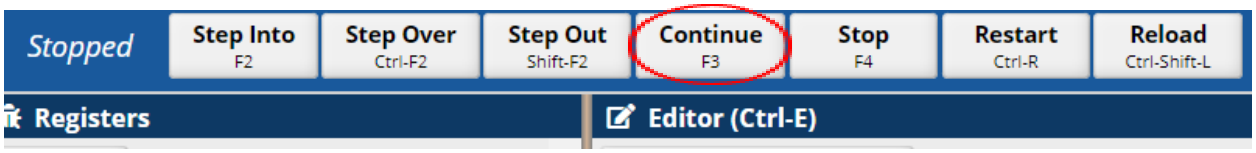

Figure 7: The button “Continue” highlighted.

The entire game will be played within the terminal panel.

The Game Board

The game board is the area in which the game assets are placed on.

The board is represented using numbers. 1 represents the wall. 0 represents free space. 9 represents the player. 8 represents the target. 3 represents the box. For more information refer to page 7.

```
1111111111
1000000001
1900000001
1000000001
1000000001
1000000001
1030000001
1800000001
1000000001
1111111111
```

At the very start of the game, the player will be asked to input X and Y values for the game board. The X and Y values are inclusive, meaning that an 8x8 game board will include 8x8 possible spots for the player to move on.

```
Welcome to Sokoban Assembly!
Input the X and Y values for the board.
Recommended to start with 8x8 at first).
Input X value:
8
Input Y value:
8
```

The game will construct the board with the given inputs and randomize the locations of the character, target, and box.

For the game to run, ensure your inputs are of values >= 4. We recommend playing on an 8x8 game board.

The basics:

1. The Character: The player takes control of the character which is represented by the number 9. The character's actions are controlled entirely by the player (Refer to Movement Controls for more information).
2. The Target: The target is the objective of the game. The target is represented by the number 8. The target spawns in a random location and stays completely stationary. When the box is pushed on top of the target, the player wins and the game is finished.
3. The Box: The box is the other moveable object in the game and is represented by the number 3. Similar to the target, the box is spawned in a random location. The box can only move when the player pushes it. When the box overlaps the target, the game is finished.

Movement Controls:

In order to control the character's movements, use the following inputs:

W key - Move upwards

A key - Move to the left

S key - Move downwards

D key - Move to the right

In order to push the box, the character must be adjacent to it. The player must then input the movement towards the box. If the box can move in the inputted direction, the box and the player will move simultaneously. If the push cannot be made, there will be no change to the board.

Note:

Inputting an invalid input will not progress the game. The game will only continue when a valid input is given.

Playing the Game:

After initializing the game board, the game will print a copy of the board into the terminal. You will then be prompted to input an action. When given a valid input (see the previous page for movement controls), the game will handle the input.

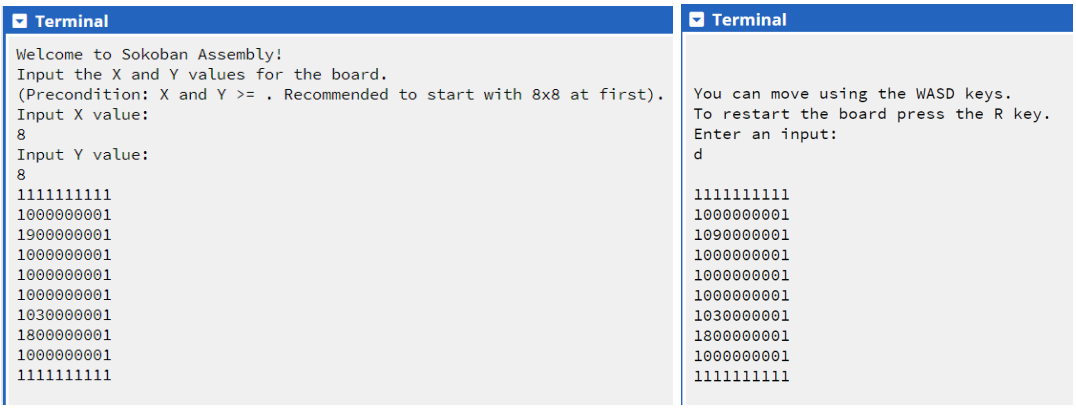

Figure 8: On the left image, it shows the game board after the player inputs the X and Y values. On the right image, the player is prompted to input a command. The play moves right and the character moves right

Finishing the Game:

The game will finish once the box overlaps the target. You will be congratulated on your skill and the game will be stopped.

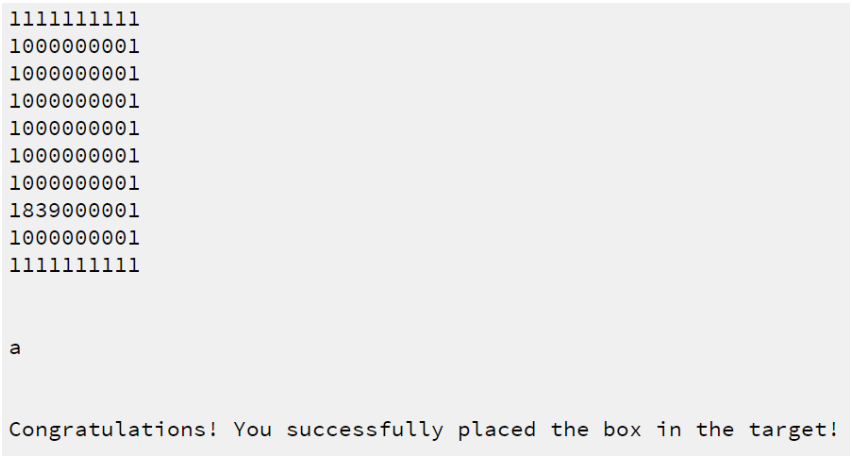

Figure 8: The last move to the left is inputted and the game congratulates the player.

Resetting the Game

If you decide you want a new board to play with, you have two options.

If you are inside an already running game, you can reset the board by typing and entering the “R” key when you are prompted for user input.

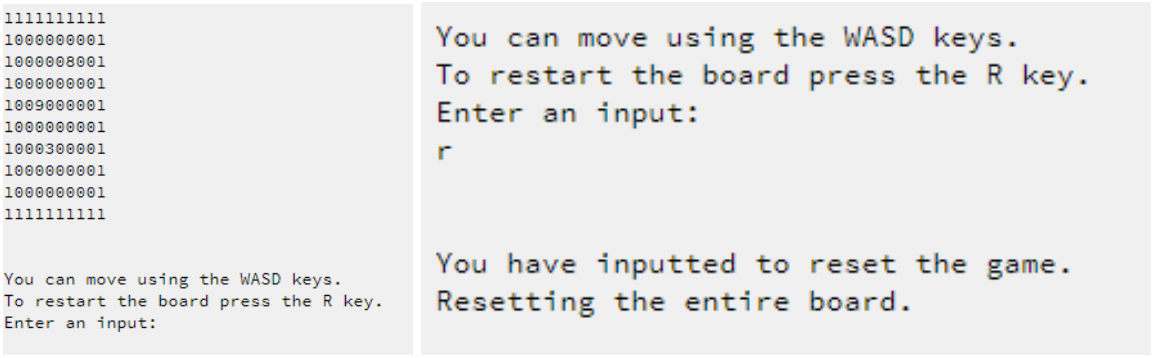

Figure 8: Inside of the terminal panel, before and after inputting the “R” key.

If you have completed the game, you must press the “Restart” and “Reload” buttons, then press the “continue” button to start the game again.

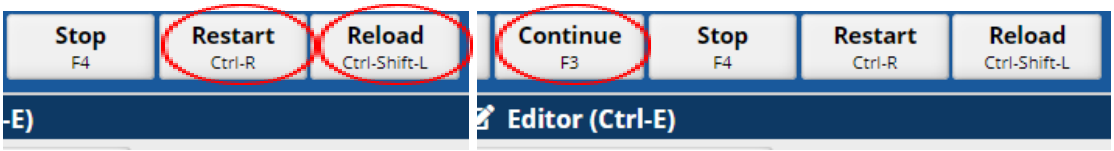

Figure 9: The buttons “Restart”, “Reload”, “Continue” highlighted.