[Pathfinder]

User Documentation

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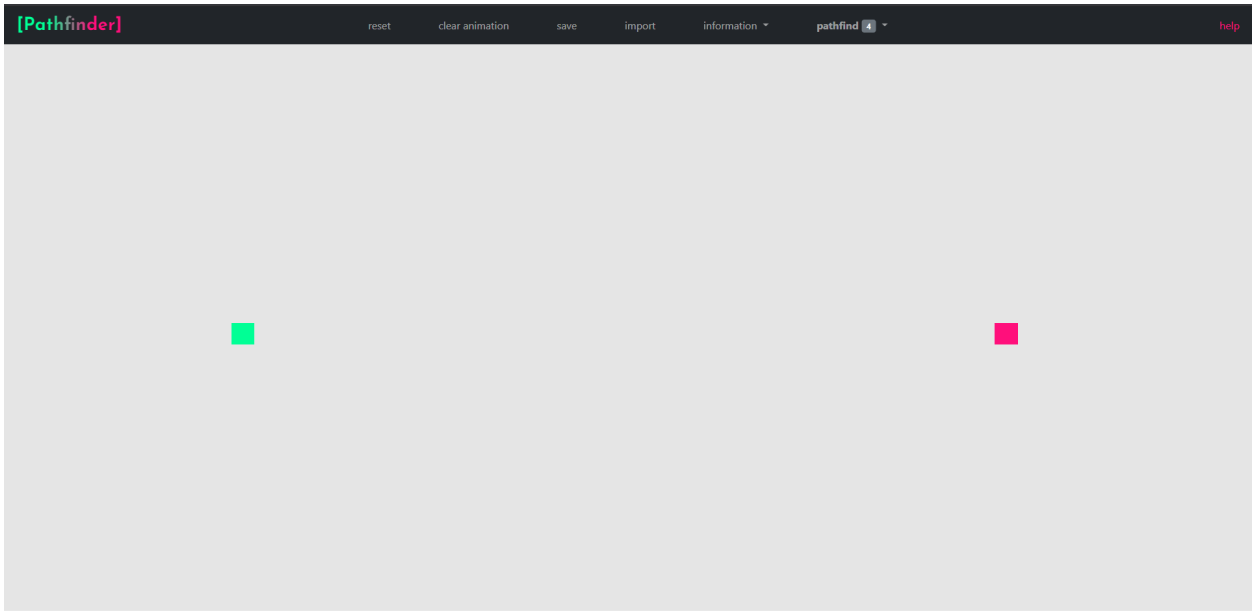
Important Terminology

- *Grid* refers to the array of *cells* that make up the majority of the window.
- A *node* refers to either the start cell or the end cell. A pathfinding algorithm will attempt to find the shortest path between these two nodes.
- A *wall* or *barrier block* refers to the black cells that cannot be traversed by the pathfinding algorithm.
- A *visited* cell refers to the cells that were explored by the pathfinding algorithm but not determined to be an optimal move.
- The *shortest path* cells are a series of cells that represent the optimal path as determined by the pathfinding algorithm.

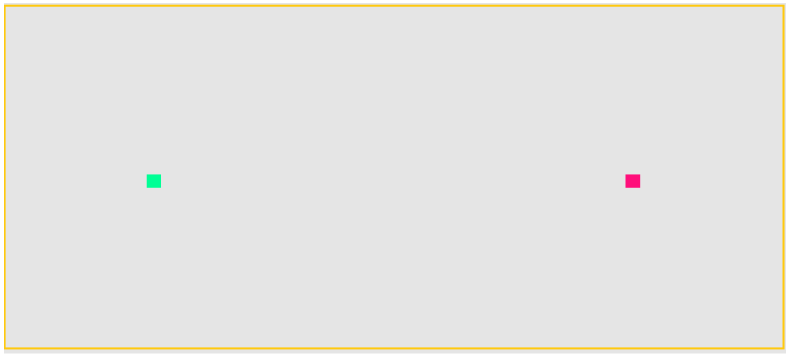
Window

When the page is loaded, it should look similar to this.



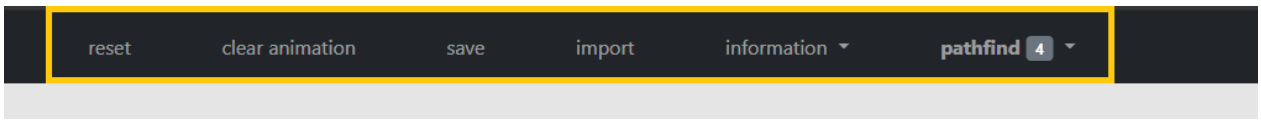
The software will dynamically create the grid to fit the size of the window. The software will work on any modern browser but is incompatible on mobile devices in its current state. The software runs entirely on one web page primarily consisting of a navigation bar and a grid.

Grid



The area highlighted above features a grid of cells. A user can interact with the grid through simple mouse inputs. For example, the left mouse button can be used to place barrier blocks on any of the empty cells in the grid area. These barrier blocks can then be removed by right clicking on them if necessary. The start node and end node can be dragged around the grid with either the left or right mouse buttons.

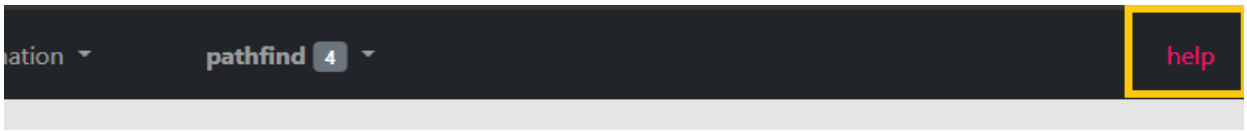
Navigation Bar



In the image above, the navigation bar is highlighted. The navigation bar contains the following buttons from left to right: *reset*, *clear animation*, *save* and *import* followed by two drop down menus labeled *information* and *pathfind*.

- The *reset* button will completely reset the grid, making it appear similar to how it looked when the page was first loaded.
- The *clear animation* button will clear all of the visualisation effects from the grid, leaving only the walls, the start node and the end node.
- The *save* button will capture the current state of the grid, prompt the user for a file name and then download the grid such that it can be imported later on.
- The *import* button will accept .csv files such as the ones downloaded when the save button is pressed. The *import* button will cause the .csv file to be read into the system and then displayed on the grid.
- The *information* dropdown will provide the capability to select a pathfinding algorithm and learn about it, gaining further insight into how it works.
- The *pathfind* dropdown menu is used to select a pathfinding algorithm which will animate the shortest path from the start (green) to the end (pink) nodes on the grid as well as all the grid cells that are visited by the algorithm.

Help Button



The *help* button provides a user with a summary of the user documentation, a brief description of how to use the software. The guide includes a link to the readme file located in the Pathfinder Github repository for a slightly more in depth explanation.

How to use the software

Using the information above, simply interact with the grid by placing barrier blocks and moving the start or end nodes around and then select a pathfinding algorithm from the *pathfind* drop down menu. The software will animate all of the cells that the selected algorithm visited, known as visited cells as well as the shortest path determined by the algorithm. As described above, the navbar houses any options that you may require to manipulate the grid further.

Additional features / Information

Additional features include the live pathfinding. To use this feature, simply generate a path from the algorithm dropdown and after the animation has played, interact with the grid. You may draw additional barriers, remove previous barriers or drag either node around to see the live adjustment to the shortest path.

Multilingual support is available through the browser's settings if this feature is required.