CMSC 447
Software Requirements Specification (SRS)

Name	Role	Signature

1 Scope

1.1 Identification

This document describes the testing of a web application that simulates a customizable Conway's Game of Life. This application will run on the current version of chrome, 73.0.3683.103 and the current version of Firefox ESR 67.0+.

1.2 System overview

The purpose of this system is to provide users a customizable version of Conway's game of life in the form of a web application. This document applies to the web application. Additionally, the system shall provide the user with a means of customizing the appearance, speed, and functionality of Conway's Game of Life. This system will be developed and tested over a three-month period by a group of six. The operation of the system shall be accessible for the software sponsor, acquirer and user, Geoff Weiss, and Russell Cain. The development team does not have access to a support agency. This system is operable on any computer installed with the current releases of Chrome and Firefox ESR (defined in paragraph 1.1) and will be developed on the UMBC campus.

1.3 Document overview

This document describes the nature and requirements of a web-based, customizable Conway's Game of Life application. This application will not record or store any personal information about the user; it will store information about the user's sessions with the application. The system will not have any protection or privacy regarding the user's game information.

2 Requirements

All requirements are traceable directly to the customer unless stated otherwise.

2.1 Webpage Environment Requirements

2.1.1 Webpage shall work on web browsers.

2.1.1.1 Web application shall be viewable on Firefox's current ESR branch.

2.1.1.2 Web application shall be viewable on Chrome's current stable release branch.

2.2 Pattern Customization Requirements

2.2.1 User shall be able to customize starting cells.

2.2.1.1 User shall be able to choose from ten preset patterns for starting cells.

2.2.1.2 User shall be able to have pseudo-random pattern generation for starting cells.

2.2.1.3 User shall be able to customize starting cells with drawing on the grid.

2.2.1.4 User shall be able to customize starting cells with a file upload.

2.3 Rule Customization Requirements

2.3.1 The game shall use the standard Conway's Game of Life rules as defined in the sub-requirements.

2.3.1.1 Cells with exactly three neighbors shall become alive.

2.3.1.2 Live cells with one or fewer neighbors shall die in the next generation.

2.3.1.3 Live cells with four or more neighbors shall die in the next generation.

2.3.1.4 Live cells with two or three live neighbors shall stay alive in the next generation.

2.3.2 User shall be able to change the rules to their own custom ruleset.

2.3.2.1 User shall be able to change the number of adjacent alive cells required for a cell to die.

2.3.2.2 User shall be able to change the number of adjacent alive cells required for a cell to survive.

2.3.2.3 User shall be able to change the number of adjacent alive cells required for a cell to be born.

2.3.2.4 User shall be able to set specific cells to always be dead.

2.3.2.5 User shall be able to set specific cells to always be alive.

2.4 Graphics Customization Requirements

2.4.1 User shall be able to customize their cells' avatar.

2.4.1.1 User shall be able to set the avatar of each cell to be square.

2.4.1.2 User shall be able to set the avatar of each cell to be round.

2.4.1.3 User shall be able to set the avatar of each cell to be a triangle.

2.4.2 User shall be able to customize the colors used in displaying the game.

2.4.2.1 User shall be able to choose the color of the alive cells.

2.4.2.2 User shall be able to choose the color of the dead cells.

2.4.2.3 User shall be able to choose the color of the background grid.

2.4.3 The changes to the grid shall be animated.

2.5 Gameflow Control Requirements

2.5.1 User shall be able to pause the application.

2.5.2 User shall be able to modify the speed between frames of the application.

2.5.2.1 The user shall be able to set the speed to a minimum of 1 generation set per second.

2.5.2.2 The user shall be able to set the speed to a maximum of 60 generation sets per second.

2.5.3 Any cell changes made by the user shall take effect for the next set of iterations.

2.5.4 User shall be able to set how many frames they would like to skip (For example, seeing only every other frame).

2.5.5 The application shall end the game when no cells are alive.

2.5.6 The application shall let the user start a new game.

2.5.7 The application shall detect a steady state. A steady state is defined as two identical iterations back to back.

2.5.7.1 The application shall notify the user when a steady state has been reached.

2.6 Grid Requirements

2.6.1 User shall be able to modify the grid starting size for each set of iterations.

2.6.2 User shall be able to toggle if the grid “wraps around” so cells on the border are neighbors with other cells on the opposite border.

2.7 Displaying Information Requirements

2.7.1 There shall be a counter displayed for the number of live cells.

2.7.2 There shall be a counter displayed for the total number of cells in the grid.

2.7.3 There shall be a counter displayed for the number of frames that have occurred since the beginning of the iteration.

2.8 Design and Implementation Constraints

2.8.1 The application shall use WebAssembly for backend computations.* *NOTE: This is not a regular requirement but was specifically required by the customer.