

Test Plan, CS 4500

Latin Squares

Group 7

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First Revision: 4/22/2022 (Items to be tested & Results)

Second Revision: 4/22/2022 (Introduction & Appendix)

Third Revision: 5/5/2022 (Final Additions)

Introduction

Our finished product is meant to help students improve their logical thinking skills, as the Latin Square game is the basis of many different puzzles and games. Sudoku is one of the more popular forms of the Latin Square game. Students may start off a bit confused, but once they solve their first Latin Square puzzle, they will slowly see improvements in their performance and logical thinking. The main technique with Sudoku and other Latin Squares is the process of elimination, because within each 3x3 square there is only a single combination that works. In other words, there is only one solution for each board.

Items to be Tested

- **2.1 - Latin Square Program:** This unit is to denote the functionality of the program itself, which will be tested by a user/tester clicking on the website link and determining whether the program successfully opens/displays the correct information on the starting screen. If the program loads in the browser without crashing and displays the main menu, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin. Passed

- **2.2 - Difficulty Button:** This unit is to denote the functionality of the difficulty buttons, which will be tested by a user/tester clicking on one of the three difficulty buttons, and determining whether the program successfully launches a game of Latin Squares with the desired difficulty in mind. If the program creates a game of Latin Squares that accurately reflects the chosen difficulty without crashing, then the test is a success.

Test 1 (Easy): 4/22/22, Caleb Kimberlin. Passed

Test 2 (Medium): 4/22/22, Caleb Kimberlin. Passed

Test 3 (Hard): 4/22/22, Caleb Kimberlin, Passed

- **2.3 - Hint Button:** This unit is to denote the functionality of the “Hint” button, which will be tested by a user/tester clicking on the “Hint” button during a Latin Square game, and determining whether the program successfully filled in an empty space for them. If the program fills in an empty square with the correct value for that square after the user hits the button without crashing the program or going over the limit set by the chosen difficulty, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin, Passed on Easy difficulty

Test 2: 4/22/22, Caleb Kimberlin, Passed on Medium difficulty

Test 3: 4/22/22, Caleb Kimberlin, Passed on Hard difficulty

- **2.4 - Check Squares Button:** This unit is to denote the functionality of the “Check Squares” button, which will be tested by a user/tester clicking on the “Check Squares” button during and at the end of a Latin Squares game, and determining whether the game ends or makes the user continue to play the game. If the program does not display the game over screen when the user still has incorrect/empty spaces on the board upon clicking the button, and the program displays the game over screen when the user has successfully filled in all spaces on the board correctly upon clicking the button without crashing the program, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin, Passed on Easy difficulty

Test 2: 5/5/22, Amal Presingu, Passed on Medium difficulty

Test 3: 5/5/22, Amal Presingu, Passed on Hard difficulty

- **2.5 - Unfilled Squares:** This unit is to denote the functionality of the unfilled squares within each game of Latin Squares, which will be tested by a user/tester clicking on an

empty square, and determining whether the program displays a selected number from a given list within the selected square. If the program displays the number pad after clicking on a given square, and displays a number once selected from the list without crashing the program, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin, **Passed** during 2 games on Easy difficulty

Test 2: 5/5/22, Amal Presingu, **Passed** multiple games on Medium difficulty

Test 3: 5/5/22, Amal Presingu, **Passed** multiple games on Hard difficulty

- **2.6 - Play Again Button:** This unit is to denote the functionality of the “Play Again” button, which will be tested by a user/tester clicking on the “Play Again” button upon finishing a game of Latin Squares, and determining whether the program creates a new game of the same selected difficulty as the previous game. If the program creates a different game of the same difficulty as the previous game without crashing the program, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin, **Passed** after 2 games on Easy and Medium difficulty

Test 2: 5/5/22, Amal Presingu, **Failed** on all game difficulties (removed this button, as it overlaps with “return to menu” and doesn’t serve any other purpose)

- **2.7 - Return to Menu Button:** This unit is to denote the functionality of the “Return to Menu” button, which will be tested by a user/tester clicking on the “Return to Menu” button upon finishing a game of Latin Squares, and determining whether the program displays the starting screen of the overall program. If the program brings the user back to the initial screen of the program after clicking on the “Return to Menu” button without crashing the program, then the test is a success.

Test 1: 4/22/22, Caleb Kimberlin, Passed after playing 2 separate games on Easy difficulty

- **2.8 - Main Menu Music:** After the user opens the game, music should start playing. It should then loop until the user selects a game difficulty. If the music plays, the test is a success.

Test 1: 5/5/22, Amal Presingu, Passed through multiple runs

- **2.8 - Winning Music:** After the user successfully completes the board, celebratory music should start playing. It should then loop until the user returns to the menu. If the music plays, the test is a success.

Test 1: 5/5/22, Amal Presingu, Passed on Easy difficulty

Signatures of the Testing Team

Caleb Kimberlin: Caleb Michael Kimberlin

Amal Presingu: Amal Presingu

APPENDIX A

USER MANUAL

How to Run

GitHub Repository: <https://github.com/AmalPresingu/LatinSquares>

ZIP File Link: <https://www.dropbox.com/s/u13zm6lrlaxvzuu/Latin%20Squares.zip?dl=0>

Website Link: <https://latin-squares-3tsifiddf-kingamal.vercel.app/>

1. Navigate to the website link.
2. Once the teacher pulls up the website, there will be a window with the game displayed.
3. There will be a fullscreen icon on the bottom right side of the screen to maximize the window for ideal display.
4. To view the file contents and game scripts, navigate to the GitHub repository.
5. To download the file contents and game scripts, navigate to the ZIP file link. This ZIP file can be opened in Unity, and the complete project is viewable and editable.

The Process

1. Students will be prompted with a set of instructions on how to play the game. They should take this time to look over the main menu. Teachers should use this as a supplement to further break down the game concepts if students have questions.
2. After the instructions, students should click on the “easy” gamemode to start.

3. After the board is displayed, students will have the chance to enter numbers and complete the puzzle. There are limited hints that they can click on. If they think they have completed the puzzle, they can click the “check squares” button.

4. Once the students successfully complete the game, an ending screen will show a brief celebration with celebratory music. They should click the “return to menu” button and keep practicing on the “easy” gamemode until they are ready to advance to the “medium” gamemode.

What to Expect

Latin Squares is meant to be a learning experience for students. It’s a creative way to gamify problem solving skills. Similar to Sudoku, it teaches younger students the basic fundamentals of algorithmic thinking and how to navigate problems. Furthermore, the game emphasizes pattern breakdown and efficiency. Students will also enjoy competing against classmates to see who can solve boards in the least amount of steps. The first puzzle is always the hardest to solve. Once you solve your first puzzle, the strategy will become much simpler. From that point, difficulty in the game board is the variable to focus on.