Test Documentation

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| Test Case | Input | Expected Result | Actual Result |
| 1. Load the text based in to python shell | F5 in connect4 file  or  Double click connect4 file | CONNECT 4 (2016)  =================  1 - Play: PVP - Play vs. AI (7x6)  2 - Simulation (AI vs. AI)(7x6)  3 - New Modes (Grid size, Difficulty)  4 - Save/Load Game  5 - Rules  6 - Quit  Your option: | CONNECT 4 (2016)  =================  1 - Play: PVP - Play vs. AI (7x6)  2 - Simulation (AI vs. AI)(7x6)  3 - New Modes (Grid size, Difficulty)  4 - Save/Load Game  5 - Rules  6 - Quit  Your option: |
| 2. Start a game against a human player –  1 – Play: PVP -Play vs. AI (7x6) | Your Option: ‘1'  Yellow or Red  Select Your Colour (y/r): ‘y’  Do you want to play against a computer (y/n)? ‘n’ | The program should load a GUI window. With a Button Grid that has 7 columns and 6 rows, with images on all buttons. The window should also include a restart button attached to the bottom right of the grid, and 2 labels on the right side of the window. | A GUI window, which has a 7 by 6 Button Grid, all Buttons in the Grid contain images.  A restart button in the bottom right corner of the window, including 2 labels on the right side of the window. |
| 3. Play Game | Click on any button within the grid. | The button selected should create a yellows disc/circle image on the last available space in the column.  After yellow player takes turn, the red player should be able to input their red disc. | The game works correctly, with the discs entering the last available space within the column and produces the correct images. The turn base function works correctly, where the yellow player started, then the red player and vice versa. |
| 4. Restart Game | Click the ‘Restart’ button in the GUI window | The GUI window should be destroyed and restart the method. The shell should have text, asking the user to input their colour and opponent selection. The GUI window should be displayed with an empty grid/board. | The GUI window is destroyed. The program asks the user to enter their colour and opponent. After the user inputs their choices, the game GUI starts with an empty gameboard. |
| 5. Win Game | Connect four of the same coloured disc in any direction | As soon as four of the same coloured disc are connected, the game should stop the game and display a message box which informs the user which player won the game. Once the user clicks the ‘ok’ or quit button on the message box, the program should take the user back to the game menu, as shown in test case 1. | The check\_winner method works correctly as the game displayed a message box as soon as four of the same discs were connected. The message box also displays correctly with the correct information. The program returns to the game menu if the user quits the GUI window. |
| Screen Dumps  1.    2.    3.    4.    5. | | | |

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| 6. Run the Simulation (AI vs AI) | Your Option: ‘2’ | A standard 7 by 6 GUI (same as test case 3) should be loaded, with a label name ‘SIMULATOR’.  The game should start, with the players playing against each other taking turns until the game has a winner or a draw. | Once ‘2’ is entered the program loads the board, however the simulation does not start automatically. For the game to start the user has select any button within the gameboard. |
| 7. Testing try/except statement by entering a character as an input in the game menu | Your Option: ‘a’ | I expect a print statement to be displayed, “Try Again!!!”. The program should also return and print the game menu again. | A print statement is displayed, “Try Again!!!”  The game menu is also displayed. |
| 8. Enter the New Modes option | Your Option: ‘3’ | NEW MODES  a - Grid Size  b - Difficulty  c - Return to Menu  Your option: | NEW MODES  a - Grid Size  b - Difficulty  c - Return to Menu  Your option: |
| 9. Play with a small gameboard against AI | Your option: ‘a’  Enter the number of the grid you wish to play with: ‘1’  Please select your colour (y/r): y  Do you want to play against computer (y/n)? y | A GUI of Connect 4 with a grid of buttons, however the grid should have 5 columns with 4 rows. The user should be able to place disc in any column and the disc should be placed accordingly (next available space).  The AI should also be set on easy (random) by default as there is no AI difficulty for changed grid sizes. | A GUI button grid is displayed with the correct design, 5 columns and 4 rows. The mechanics of the game works correctly and the AI makes random moves |
| 10. Play with a large gameboard | Your option: ‘a’  Enter the number of the grid you wish to play with: ‘1’  Please select your colour (y/r): y  Do you want to play against computer (y/n)? y | A GUI of a Connect 4 button grid, with 9 columns and 8 rows. The buttons should be a smaller size compared to previous gameboards and the images should also be smaller to accommodate the smaller buttons. The AI should make moves that are random. | A GUI button grid of Connect 4 is displayed with 9 columns and 8 rows. The buttons are smaller and the images are also displayed correctly. The moves of the AI are completely random. |
| 11. The small and large gameboards winner functions | Connect 4 of same disc colour in any direction | The game should be stopped and the winner should be announced though a message box. | The game is stopped and the winner is announced through a message box. |
| 12. Play with an Advanced Difficulty | Your option: ‘b’  Select Difficulty: Easy(e) - Medium (default)(m) - Advanced (a) > ‘a’  Please select your colour (y/r): y | The advanced AI difficulty should immediately try to connect 4 in the middle column. If the user stops this attempt, try to connect 4 in row (diagonally). If the user attempts to connect 4 in a column, row or diagonally the AI should only block these moves in certain areas only (the AI has not been fully completed to observe every move) . | As expected the AI does try to connect 4 in the middle row, however if the human player places their move in the middle row first the AI will counter by placing pieces in the next column to prevent user from connecting 4 horizontally. The AI does block most vertical attempts of connecting 4 and only some diagonal and horizontal attempts. While the AI blocks the user from connecting 4 it also lets the AI connect 4 if they have 3 of the same disc in certain areas. |
| 13. Play with Easy Difficulty | Your option: ‘b’  Select Difficulty: Easy(e) - Medium (default)(m) - Advanced (a) > ‘m’  Please select your colour (y/r): y | The moves of the AI should be completely random and select all but any column in the gameboard. This should make it easier for the human player to win the game. | The AI made completely random moves, and it was much easier to win the game. |
| Screen Dumps  6.    7.    8.    9.      10.    11.      12. | | | |

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| Test Case | Input | Expected Result | Actual Result |
| 14. Check Winner (horizontal, vertical and diagonal) & Full Board (draw) on normal/standard board | Connect 4 Horizontally, Vertically and Diagonally | The game should stop and announce the winner through a message box | For all directions the user connected 4, the game announced the winner |
| 15. Play against Computer Player in Play option, the difficulty is set on medium and is not changeable. This difficulty is the same as the one selected through the modes menu. | Click buttons on the grid, and try to connect 4. | As the user connects 3 in vertically, the AI should block this attempt up to a certain point. The AI should also try to connect 4 in the first column. The user should be able to win the game however with slight challenges. | The same results as expected. Where the AI tried to connect 4 in the first column and at the same time tries prevent user from winning by blocking some moves such as vertical and horizontal moves. However, a definite way for the user to win is to connect 4 diagonally. |
| 16. Return to game menu through the modes menu. | NEW MODES  a - Grid Size  b - Difficulty  c - Return to Menu  Your option: ‘c’ | CONNECT 4 (2016)  =================  1 - Play: PVP - Play vs. AI (7x6)  2 - Simulation (AI vs. AI)(7x6)  3 - New Modes (Grid size, Difficulty)  4 - Save/Load Game  5 - Rules  6 - Quit  Your option: | CONNECT 4 (2016)  =================  1 - Play: PVP - Play vs. AI (7x6)  2 - Simulation (AI vs. AI)(7x6)  3 - New Modes (Grid size, Difficulty)  4 - Save/Load Game  5 - Rules  6 - Quit  Your option: |
| 17. Test incorrect keyboard inputs when selecting colour or opponent | Please Select Your Colour(y/r): a  Do you want to play against a computer(y/n)? b | The game should still run, however by default the first player is red and the opponent is human player. | The game runs with player 1 as the red disc and the opponent is a human player. |
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| Test Case | Input | Expected Result | Actual Result |
| 18. Save and Load a game | Your option: ‘4’  Please Select Your Colour(y/r): y  Do you want to play against a computer(y/n)? y | I expect the game to save to text file, when the user quits a game half way or even if winner is found. When the user enters ‘4’ in the game menu I expect a game to start with list stored in the file. | Index Error |
| 19. Read Rules | Your option: ‘5’ | Print statements explaining the rules of the game. | Print statements explaining the rules of the game. |
| 20. Quit Program | Your option: ‘6’ | Prompt user if they want to quit program if user agrees the program will shut down. | Prompt user if they want to quit program, if user agrees the program will shut down. |
| Screen Dumps  18.    File location    GameBoard List saved in file    19.    20. | | | |