**TESTS**

**General Game Functions**

* Expert board generated on startup
* Generating a beginner and intermediate size board
* Can't generate 0 size board
* Can't generate a board bigger than 50x50
* Can't generate a board with more mines than cells
* Resetting current game doesn’t generate new board
* Play random boards generates a random size board every reset
* Reset button generates new board of same size
* Time ticks when first cell clicked and ends when game ends but doesn’t reset until board resets

*Testing objective 1*

**Stats Functions**

* Human stats table visible on load
* Switch stats button changes between stats tables and updates count
* Filter difficulty and result functions as intended
* Filter time and 3bv functions as intended, less than checkboxes flip between less than and greater than
* Reset filter correctly resets all filters and table
* Double clicking a row opens that game

(*testing objective 10, 11 and 12)*

**Custom Board Functions**

* No board visible on load
* Cant generate 0 size board
* Cant generate board bigger than 50x50
* Use image from clipboard throws error if it cant find a board or nothing is on clipboard
* Use image from clipboard generates the correct board from the image
* Save image opens a file dialogue, and saves an image of just the board
* Reset clears the board
* Clear shading removes all shading from cells, but does nothing if no cells are shaded

(*testing objective 13 and 14*)

**Trainer Functions**

* Game form and trainer form opens on load
* Clicking each difficulty generates a new board of that difficulty

**Computer Play**

* Clicking play causes the computer to begin solving
* Clicking stop causes the computer to stop solving, without resetting the board
* Changing the delay causes the computer to wait the specified number of milliseconds in between moves
* The computer can correctly convert the state of the board to an array of cells (*testing objective 2)*
* When the computer finishes (loss or win) it resets and starts again (*testing objective 7)*
* When the computer finishes it writes the results of the game, along with how to remake that game to a text file (*testing objective 8*)
* Every game is started in the top left corner of the board
* The computer will find all “simple” safe cells in a position and open them all (*testing objective 3)*
* If a “simple” move can’t be made then the constraint solver is used, if that finds a move then it is made (*testing objective 4)*
* If no move can be made then a guess is attempted, this should be educated not random (*testing objective 5)*
* If the educated guess isn’t optimal then a random cell is opened in the hierarchy of Corner – Edge – Middle
* The computer should win 25+% of games on expert mode over a large sample size (*testing objective 9*)

**Custom Board Solving**

* Clicking solve will only work if the board is a valid minesweeper board (including from clipboard)
* After solving, any safe cells will be highlighted green and any mine cells would be highlighted red and the counts of each displayed on the right
* If no safe cells are present then the best guess should be highlighted yellow along with the probability on the right

(*testing objective 13 and 14*)

**Overall**

* All buttons work as intended, navigation through the program is easy and intuitive