**Project 3: Hour Glass Simulation**

**EE 365: Small Computer Software**

Abdullah Aljandali

Date submitted: October 1, 2018

**Overview of the project:**

Made a WPF application using visual studio C#. The application simulates an hour glass.

To accomplish this, I take the number of sand grains as an input from the user and use it to find the height and width of the hour glass. I make a 2d array of integers corresponding to the height and width and fill it with values 0,1,2 meaning empty, full, wall respectively. I made a draw function that uses this array to draw ellipses (circles in this case) with different colors representing the 0,1,2 integers.

I used a thread to go throw all the generations (2d arrays) of the sand dropping and pushing them into a queue, concurrently with a timer that updates the image using this queue and dequeue once it’s done drawing.

A “stop” button allows the user to pause the program. The program can be resumed by clicking run. The “reset” button on the other hand resets everything to the starting position.

I used a background worker to enable buttons for 10 seconds whenever the user clicks the spacebar without interfering with the interface.

Extras:

1. The sand changes color as it passes through the neck of the hour glass.
2. Allows the user to set the number of grains of sand.
3. Allows the user to adjust the time between iterations.
4. Run forever button
5. Animated rotation
6. User can pick the color of the sand
7. Reset button
8. About
9. Instructions