Name \_\_Zhao, Rena\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_05/02/22\_\_\_\_\_\_\_\_\_\_

NetID: \_\_ryz215\_\_\_\_\_\_ Section: \_\_007\_\_\_\_\_\_\_\_\_

**Shape

Description automatically generated with medium confidence**

I have completed this assignment independently:

**Assignment 2**

**Total in points** (100 points total): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Professor’s Comments:**

**GitHub:** <https://github.com/ryzhao123/cso-sp22/blob/main/assignment-2/automata.c>

**automata.c**

* Creates two matrices arr and ret of size 5x5 that are global

**main function**

* The main function reads in a file.
* First, it checks if there is an appropriate command.

Logo

Description automatically generated with medium confidence

* Next, it checks if there is a file to read.

A picture containing diagram

Description automatically generated

* Copies the array from the input file into arr. This will be our first gen.

Text

Description automatically generated

* For the number of generations specified in the command line argument, we loop through the evolution function for every cell. Then, after each generation, we call the copyArray function (will go into more detail in a later section).
* Text

  Description automatically generated
* This section creates the output file. It loops through all the cells in the ret matrix and copies them into a file.
* Text

  Description automatically generated

**evolution function**

* Passes in two parameters int r and int c for rows and columns, respectively. For each cell in the matrix, this function is called one time and depending on the values for r and c, only some if statements may be, which influences how neighbors are counted.
* Instantiates a variable count that counts alive neighbors.
* Counts neighbors if the selected cell is not in the top row. The second if statement inside counts neighbors if the cell is not in the left column, and the third if statement inside counts neighbors if the cell is not in the right column.

Text

Description automatically generated

* Counts neighbors if the selected cell is not in the bottom row. The second if statement inside counts neighbors if the cell is not in the left column, and the third if statement inside counts neighbors if the cell is not in the right column.

Text

Description automatically generated

* Now we count neighbors if the selected cell is not in the left column. Then, we count neighbors if the selected cell is not in the right column.

Text

Description automatically generated

**copyArray function**

* This function uses nested for loops to copy each element of ret into arr. I did this because I ran into a problem where every generation was using the same original matrix.

A picture containing calendar

Description automatically generated