

Conway's Game of Life

Chelsea Chen

University of Alberta Department of Computer Science

Introduction

- Conway's Game of Life was created by John Conway
- it is cellular automaton, zero player game, and a turing complete used to demonstrate the status of cells and how it evolves depending on its neighbours
- It is played on a two-dimensional grid with cells that are either dead and alive
- With each of the iterations that occur, a new generation is created, which may vary or remain static

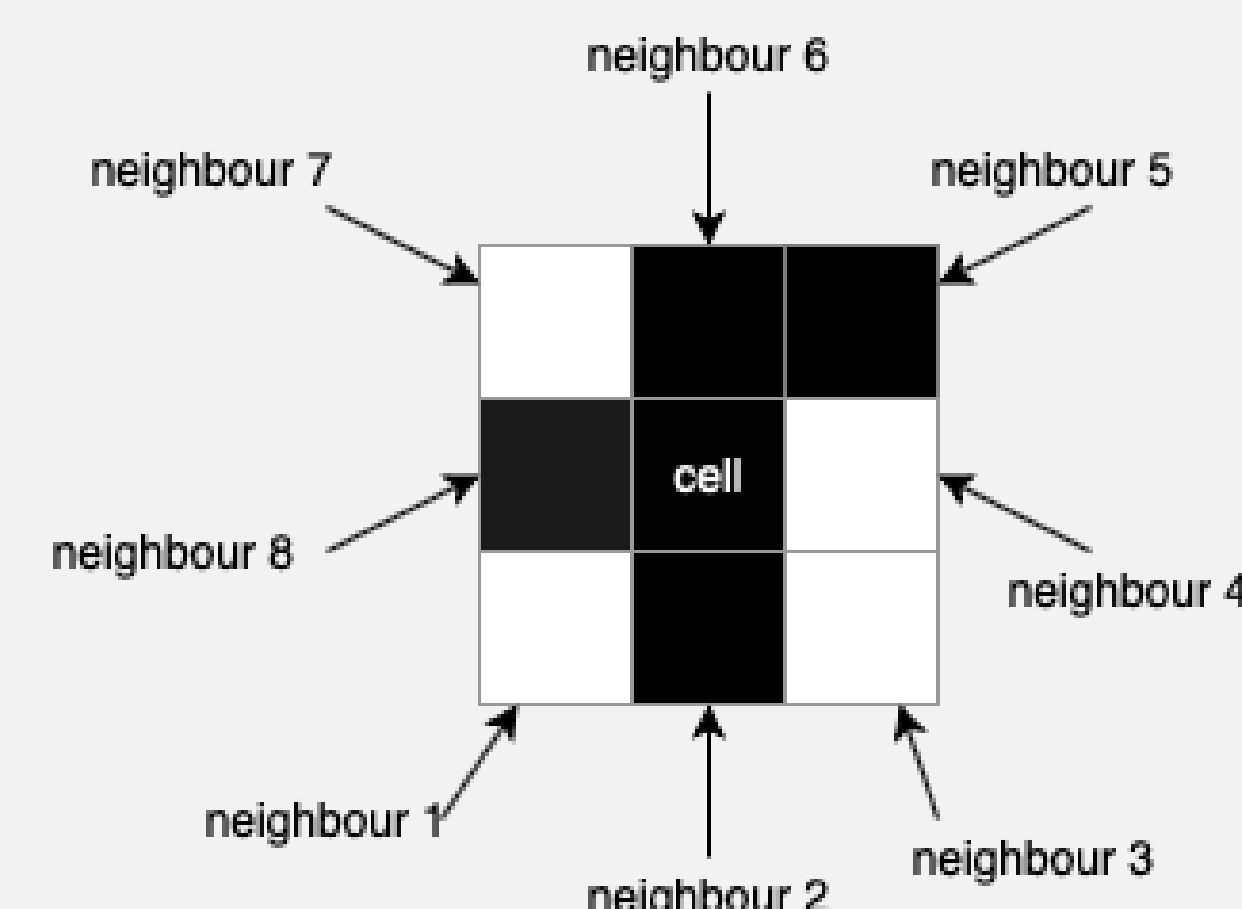


Fig.: This is the R pentomino. It has eight neighbours, with four alive neighbours and four dead neighbours

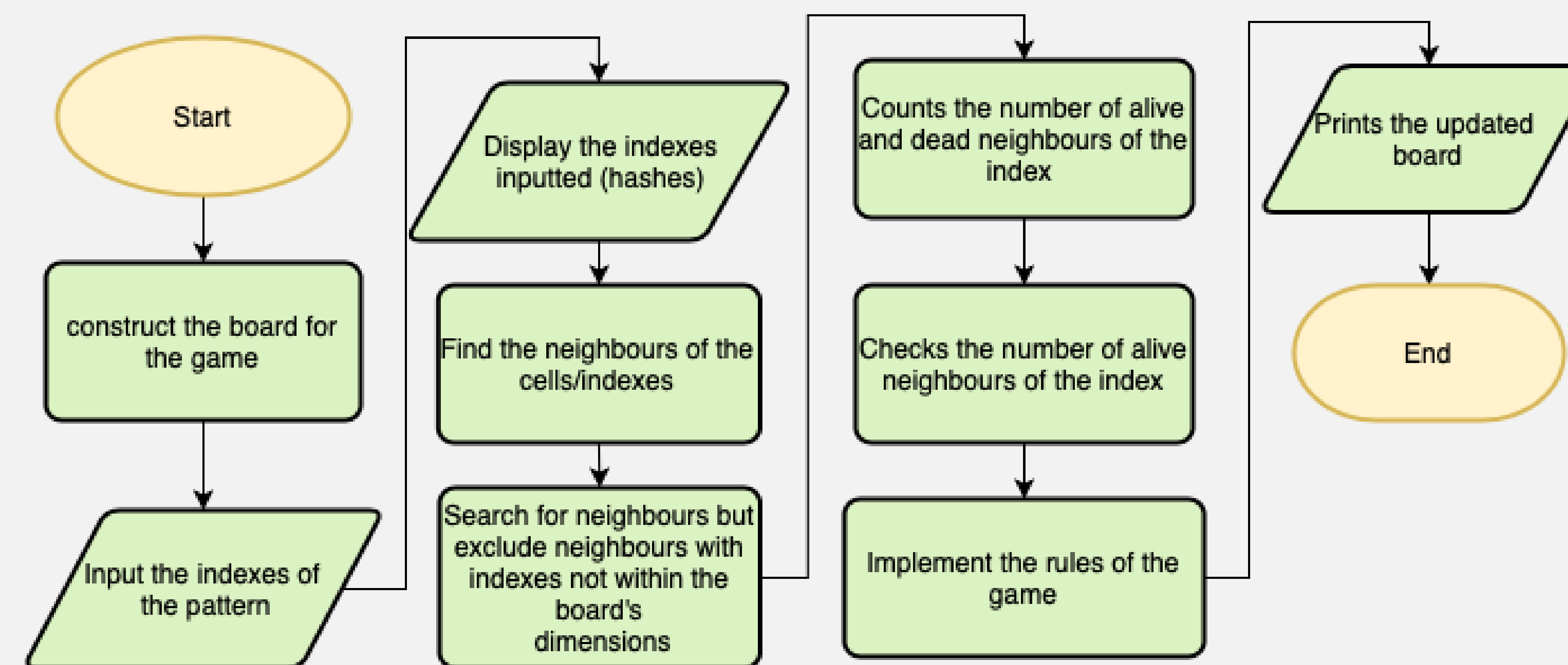
Rules

- 1 A cell with less than two neighbours dies (under population)
- 2 A cell with more than three neighbours dies (overpopulation/overcrowding)
- 3 A cell with two neighbours lives

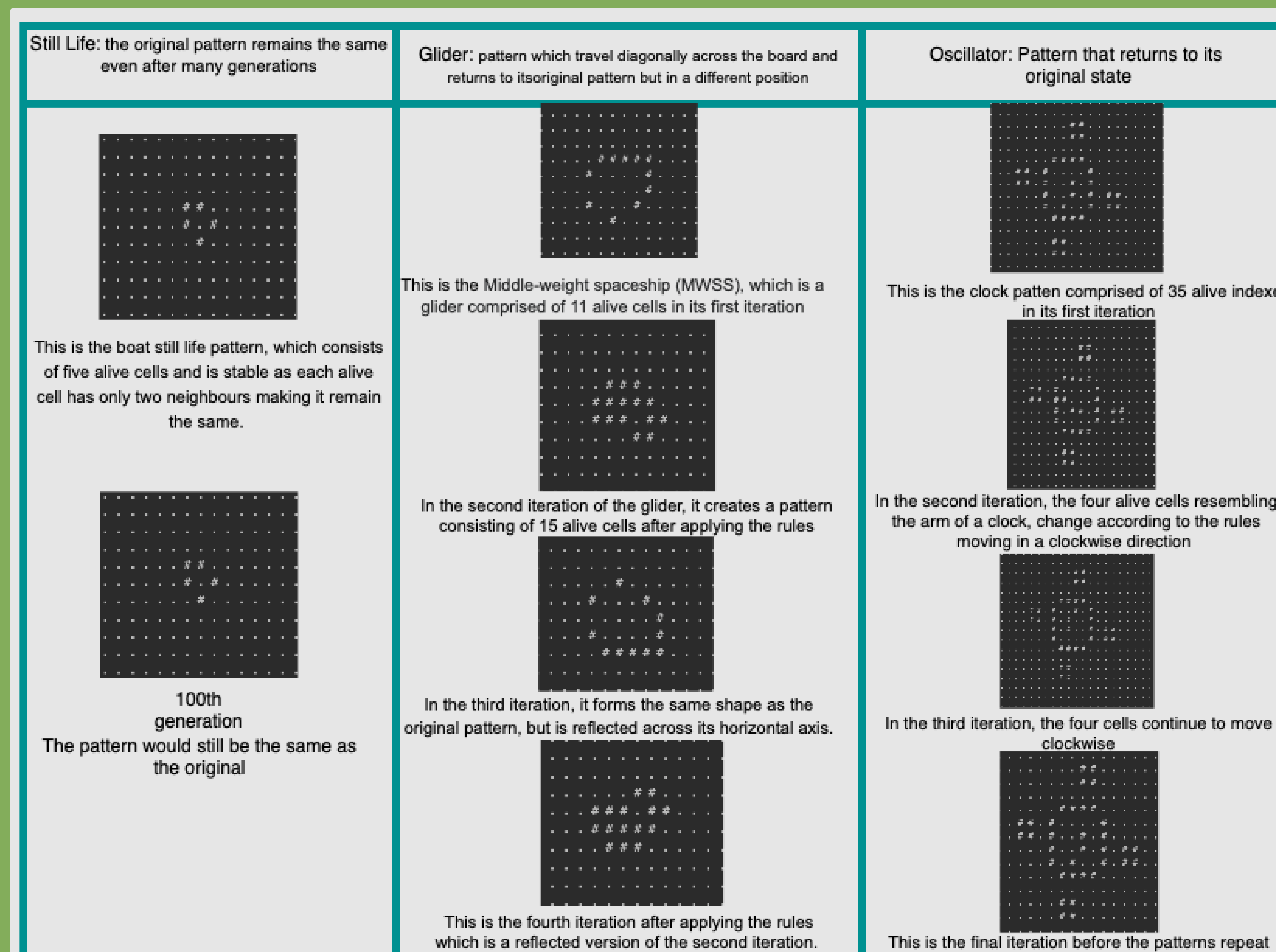
The Goal of The Project

- initiate and display patterns while applying the rules of the game using Python
- investigate and recreate algorithms associated with Conway's Game of Life, which initializes patterns and outputs future generations.

Overview of Project



Patterns



What I learned

- developed practical programming skills in Python and experimented with the use of arrays and methods to program algorithms used within Game of life
- Through the observation of basic patterns, such as the glider, oscillators, and still life, was able to view the application of these rules and patterns and apply this understanding in recreating the program

Conclusion

Results:

- The program is able to receive inputs from the user in the form of indexes (row, column) and output the patterns and its generation on a 100 x 100 grid with dots(dead) and hashes (alive).

Improvements for the future:

- improving the graphics of the program and the user interface
- Implementing a function which alters the size of the board depending on the pattern

References and Acknowledgments

<http://pi.math.cornell.edu/lipa/mec/lesson6.html>

I would like to thank Maithrreya Srinivasan, Ioanna Papathanasaki, Yusra Ali, Sowmya Challa, and Maheen Mughal for their help and guidance throughout this internship. I would also like to thank the HIP coordinators and the Tate family for making this possible and allowing me to participate.