**Conway’s Game of Life**

**Python 3 and Tkinter**

**Purpose**

The purpose of this project is to develop an interactive version of Conway’s Game of Life using the Python 3 language and the Tkinter GUI package. This project and all associated activities (i.e. design, development, testing, etc.) are undertaken as a personal learning exercise for the project’s creator.

**Introduction**

Conway's Game of Life has four rules:

1. If a cell is ON and has fewer than two neighbors that are ON, it turns OFF.
2. If a cell is ON and has either two or three neighbors that are ON, it remains ON.
3. If a cell is ON and has more than three neighbors that are ON, it turns OFF.
4. If a cell is OFF and has exactly three neighbors that are ON, it turns ON.

Algorithm:

1. Initialize the cells in the grid.
2. At each time step in the simulation, for each cell (x, y) in the grid, do the following:
   1. Update the value of cell (x, y) based on its neighbors using toroidal boundary conditions.
   2. Update the display of grid values.

**Resources**

Wikipedia – [Conway’s Game of Life](https://en.wikipedia.org/wiki/Conway%27s_Game_of_Life)

Edwin Martin – [John Conway’s Game of Life](https://playgameoflife.com/) (example)

[TkDocs](https://tkdocs.com/index.html)

Python 3.7 Documentation – [Graphical User Interfaces with Tk](https://docs.python.org/3.7/library/tk.html)

Fredrik Lundh – [An Introduction to Tkinter](http://effbot.org/tkinterbook/)

John W. Shipman (New Mexico Tech) – [Tkinter 8.5 reference: a GUI for Python](http://infohost.nmt.edu/tcc/help/pubs/tkinter/web/index.html)

**Requirements**

* The application is written in the Python 3 programming language.
* The application uses the Tkinter GUI package to implement the graphical user interface.
* The window uses a 16:9 aspect ratio.

**Design**

**Classes**

|  |  |
| --- | --- |
| Application |  |
| Window |  |
| Grid |  |