In 1970, the mathematician John Horton Conway developed a zero player game called Life. He did so as a way of answering a previously posed mathematical question, but for this assignment, you need not worry about that.

The Game of Life is structured in a grid of square cells, each of which is either alive or dead. Each cell interacts with the eight neighboring adjacent cells surrounding it.

The next generation of cells is produced using the following rules:

1. **Under Population**: A living cell dies if it has fewer than 2 living neighbors.
2. **Overcrowding**: A living cell dies if it has more than 3 living neighbors.
3. **Survival**: A living cell continues living in the next generation if it has 2 or 3 living neighbors.
4. **Reproduction**: A dead cell becomes alive if it has exactly 3 living neighbors.

The board can be initialized with an initial defined generation, or can begin with a randomized population.

The initial pattern constitutes the seed of the system. The first generation is created by applying the above rules simultaneously to every cell in the seed—births and deaths occur simultaneously. Therefore, the next generation will be created based on the application of the rules to the previous generation. The rules continue to be applied repeatedly to create further generations.