Game Life of Form

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4CCS1PPA

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Base Task

We have introduced three new life forms:

- ## Purple Cell 
  - If it encounters a Spiral neighbor, both will die in the next generation. Otherwise:
  - If the cell has 3 or fewer neighbors, it will survive into the next generation
  - If a dead cell has exactly 3 or 4 neighbors, it will revive in the next generation
- ## Spiral Cell 
  - If it encounters a Purple neighbor, it will die in the next generation.
  - If the cell has an even number of neighbors and its size is less than 7, it will survive into the next generation.
  - If a dead cell has an odd number of neighbors and its size is less than 7, it will revive in the next generation.
  -
- ## Uncertain Cell 

  It has different set of rules:

  First rule:

  - If the cell is alive and it has 1 or 4 neighbors, it will survive.
  - If a dead cell has five or seven neighbors, it will revive.

  Second rule:

  - If the cell is alive and its neighbors are divisible by 3 it will survive.
  - If a dead cell has less than four neighbors, it will revive.

  Third rule:

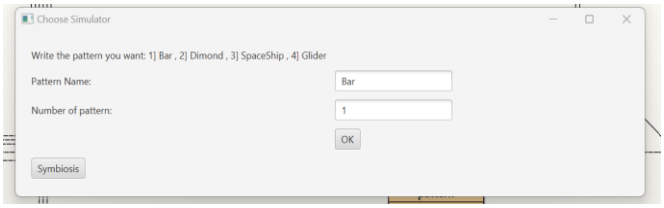
  - If the cell has an even number of neighbors, it will survive into the next generation.
  - If a dead cell has an odd number of neighbors, it will revive in the next generation.

Challenge Tasks

We have completed 4 challenge tasks:

- ## User-Interface

- We developed a user-friendly interface that allows users to choose their desired simulation. This window includes text input fields for entering the name and number of patterns. Upon clicking the 'OK' button, the selected pattern is displayed. Additionally, there is a 'Symbiosis' button which, when clicked, displays all cells in a single grid.



- ## Non-deterministic:

  - introducing a new class named "Uncertain" inherited from "Cell." It behaves randomly, with its actions determined by a randomly generated number ranging from 0 to 0.99. Each range of values triggers a different set of rules.

- ## Symbiosis:

We establish 3 long-term relationships:

- **Mutualistic relationship:**

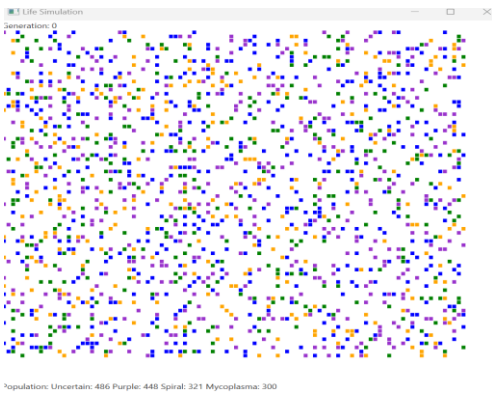
If Mycoplasma and Spiral were neighbors, they both would survive to the next generation.

- **Parasitic relationship:**

If Mycoplasma and Purple were neighbors, Mycoplasma dies while Purple survives in the next generation.

- **Competition relationship:**

If Purple and Spiral were neighbors, both would die in the next generation.



- ## Pattern Generator:
- Our program presents four different shapes, each generating unique patterns while simulating future generations. The Bar shape, the simplest of them, creates distinct patterns that stabilize after the third generation. In contrast, the Diamond and Glider shapes generate varied patterns in each generation and repeat themselves after a certain number of generations. The most intriguing is the SpaceShip shape, which generates unique patterns that cause it to move to different locations on the grid.

Bar

Dimond

Glider

SpcdeShip