THE GAME OF LIFE

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The Game of Life simulation brings to life a digital ecosystem where Mycoplasma cells and three new life forms—Amoeba, Ureaplasma, and Brucella—interact according to rules that mimic natural survival and relationships. Mycoplasma cells follow simple life rules, thriving or dying based on their neighbours. Amoeba changes colour based on their environment, signalling their health. Ureaplasma can drastically change its behaviour, wiping every fifteen generations, while Brucella introduces randomness into the ecosystem with its unpredictable actions. Through challenge tasks, the simulation explores deeper themes like the unpredictability of life (Brucella), cooperation (Amoeba and Ureaplasma), and competition (Mycoplasma and Brucella), reflecting the dynamic interplay of life forces in a simplified, engaging digital world.

Base Task:

- **Mycoplasma Behaviour Modification:**
  Adjusted to die with fewer than two or more than three live neighbours, survive with two or three live neighbours, and resurrect with exactly three neighbours. This alteration ensures all cells determine their next state simultaneously, adding depth to the simulation's ecological dynamics.

- **Three new life forms:**
  - Colour Change Form: The **Amoeba** cell changes colour based on its surroundings in the simulation. It might turn blue if it's doing well, like when near helpful Ureaplasma. It turns red if it's stressed or near harmful cells like Brucella. These colour shifts help show the Amoeba's health and interactions with other cells simply and visually.

  - Behaviour Change Form: The **Ureaplasma** cell exhibits a unique behaviour change influenced by its environment and interactions. If in its standard state (indicated by a grey colour), all Ureaplasma cells will die every fifteen generations, reflecting periodic vulnerability. Alive Ureaplasma can become "super" Ureaplasma, shown by turning black, with a 34% chance to eliminate nearby cells, enhancing its survival. This transformation is possible if it has five neighbours and is under forty generations old, with a 35% chance of occurring, showcasing its adaptability and the impact of generational changes on its lifecycle and interactions within the simulation.

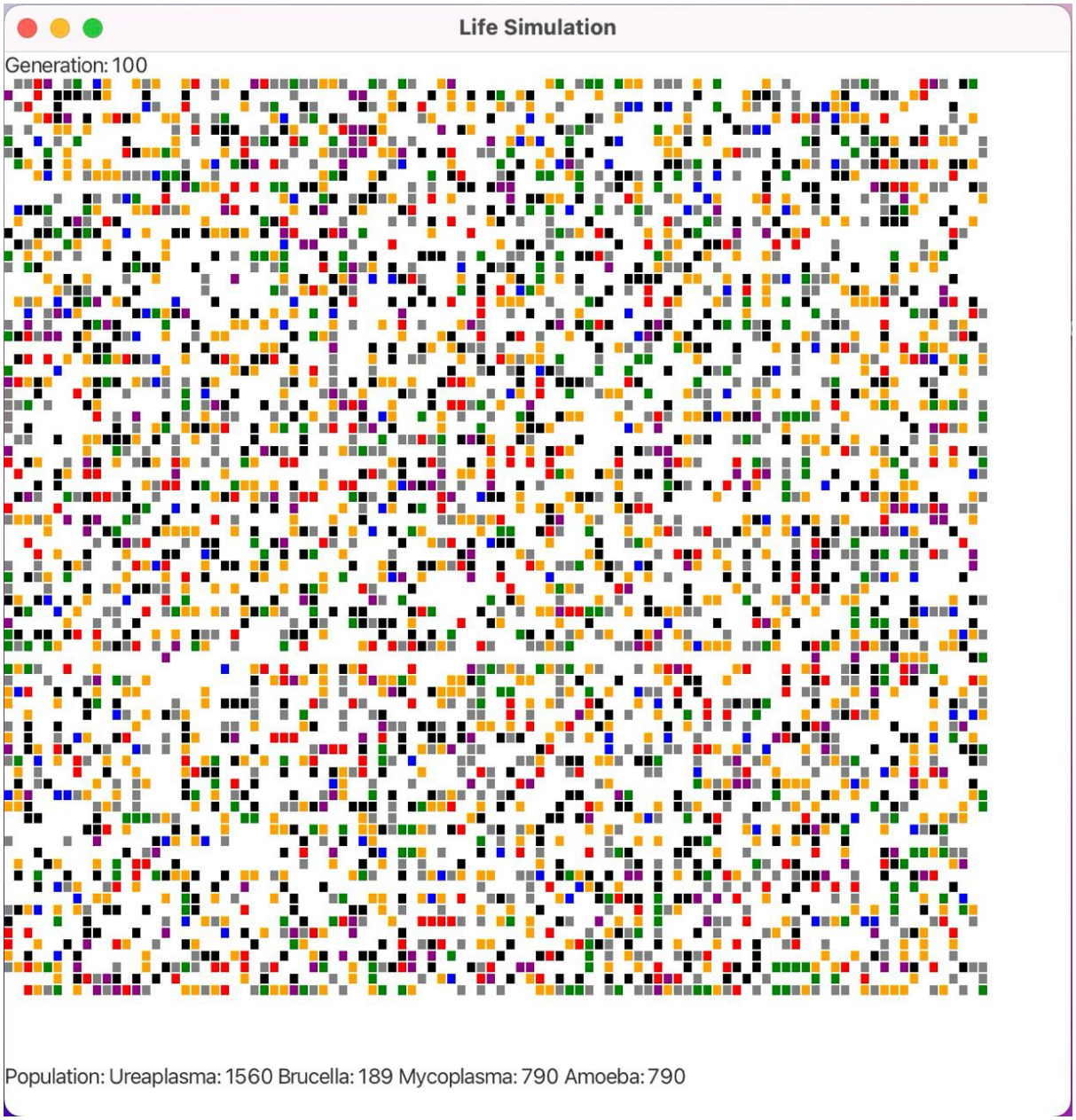
  - Other Cell Form (Challenge Task): **Brucella's** non-deterministic behaviour means its actions are based on chance, making its life cycle unpredictable. For instance, it might randomly change its state or affect nearby cells, depending on set probabilities.

Challenge task:

- **Non-deterministic Behaviour Cell:**
  Brucella's non-deterministic behaviour in the simulation is characterized by actions determined by random chance, reflecting the unpredictable nature of biological processes. With a 13% chance, Brucella may spontaneously flip its state, symbolizing sudden changes in health. A 35% chance allows Brucella to impact other cells in its row, simulating a contagious effect or environmental influence. Additionally, Brucella cells get an ‘immunity’ pass from the parasite relation every ten generations with a 25% change. Lastly, with a 27% chance, Brucella maintains its current state, representing stability amidst its unpredictable life cycle. This randomness introduces variability and challenges in predicting Brucella's impact on the ecosystem.

- **Mutualism Relationship:**
  The mutualistic relationship between Amoeba and Ureaplasma in the simulation illustrates a symbiotic interaction where both organisms benefit from each other's presence. When Amoeba is near Ureaplasma, it experiences enhanced survival or reproduction chances, indicated by a colour change or state transition. Ureaplasma gains increased resilience or a similar positive effect when in proximity to Amoeba. This mutual benefit is programmed to reflect organisms support each other's existence, leading to improved outcomes for both.

- **Parasitic Relationship:**
  In the simulation, Mycoplasma and Brucella have a parasitic relationship where Mycoplasma benefits at the expense of Brucella. When Mycoplasma is near Brucella, Mycoplasma's chances of survival and reproduction increase, possibly due to it exploiting Brucella in some way. On the other hand, Brucella's ability to survive or reproduce is harmed by the presence of Mycoplasma, showcasing a one-sided advantage. This interaction mimics real-life parasitism, where one organism gains while the other suffers.



This picture is an example of the simulation after a hundred generations.