

12. The Game of Life

Student learning outcomes

- Students will use JavaScript and CSS to populate a grid with many square or circular div elements.
- Students will use data to populate the grid with different states (on or off), based on a data structure that holds the state.
- Students will use timers to animate the movement of sequences across the grid.

Real world applications:

- The Game of Life is an example of a cellular automaton as used in games, networks, and artificial intelligence programming.

Assignment requirements:

- Display a two-dimensional grid consisting of hundreds of small squares. Insert the squares into the page using JavaScript instead of hand coded HTML.
- Each grid element is associated with a data element in a two-dimensional data structure.
- Each subsequent generation (time period) is calculated based on the current generation by creating a new data structure with the new grid, then copying the new grid back into the old one for display.
- Design features:
 - A grid of squares with styles that indicate on and off, and width and height allowed by the screen size.
 - Buttons that control the game play: start, stop, step, create a new game element.
- JavaScript features:
 - Global variables and app initialization
 - Functions
 - Nested loops
 - Initializing arrays as empty
 - Creating two-dimensional arrays
 - Changing class names on elements
 - setInterval, clearInterval, setTimeout, and clearTimeout
 - Copying an array
 - Modulo arithmetic to handle edges of the board, creating an infinite space

