Algonquin College Logo

# SCHOOL OF ADVANCED TECHNOLOGY

### ICT - Applications & Programming

### Computer Engineering Technology – Computing Science



A21

Computer Science Challenge

Lab Professor / Lab Session:

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Team:

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CS Challenge 2: Game of Life

|  |  |
| --- | --- |
| **Part**  **1** | **Implementing GL** |

**UC Diagram** (change this diagram to accommodate the actors and functionalities to be used):

A diagram of a game

Description automatically generated

**Actors table**

|  |  |
| --- | --- |
| **Actors** |  |
| Player | The person interacting with the game. |
| Game engine | The core component responsible for simulating the Game of Life. |

**UC table**

|  |  |
| --- | --- |
| **Use Cases** |  |
| Start Game | This use case represents the player starting a new game. |
| Pause Game | The player can pause the game to stop the simulation temporarily. |
| Resume Game | The player can resume a paused game. |
| Step Simulation | The player can advance the simulation one step at a time. |
| Change Configuration | The player can change the initial configuration of the game. |
| View Game State | The player can view the current state of the game. |
| Exit Game | The player can exit the game. |
| Run Continuously | The game runs continuously, evolving based on the rules of Conway's Game of Life. |

**Class Diagram** (change this diagram to accommodate the actors and functionalities to be used):

A diagram of a cell

Description automatically generated

**Class table** (example):

|  |  |
| --- | --- |
| **Class** | **Order** |
| **Class** | GameOfLife  Cell  GameRules  GameRenderer  InputHandler  ConfigurationManager |
| **Properties** | grid: Cell[][], - generation: int  x: int, - y: int, - isAlive: bool  width: int, height: int, cellSize: int |
| **Methods** | initializeGrid(), seedCell(x, y), evolve(), getCell(x, y), getGeneration()  setAlive(), setDead(), isAlive(), getNeighbors()  applyRules(cell: Cell)  renderGrid(grid: Cell[][])  handleInput()  loadConfig(), saveConfig() |
| **Relationships** | **GameOfLife** uses **GameRenderer**, **InputHandler**, **ConfigurationManager**  **GameOfLife** composed of **Cell** objects  **GameRenderer** used by **GameOfLife**  **InputHandler** used by **GameOfLife**  **Cell** composed by **ConwayGameOfLife**  **GameRules** used by **GameOfLife**  **ConfigurationManager** used by **GameOfLife** |

**GL Implementation**

A screen shot of a game

Description automatically generated

**References**

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| [1] | D. Shiffman, "The Nature of Code," [Online]. Available: https://natureofcode.com/book/chapter-7-cellular-automata/. [Accessed 10 October 2023]. |

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