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DS210

HW 8

1.

- Point<T>: Defines a generic struct for points in the Euclidean plane, where T can be any type that supports copy and negation operations, such as integers or floating-point numbers. The struct contains x and y fields representing coordinates.
- clockwise() and counterclockwise() methods: rotate the point 90 degrees clockwise or counterclockwise, respectively. The clockwise method transforms a point by swapping its x and y values and negating the new y value, while counterclockwise does the opposite, swapping and negating the new x value.
- main function: Demonstrates creating Point instances with both f64 and i32 types, applying clockwise and counterclockwise rotations, and printing the results. It verifies the correctness of rotations through assert_eq! statements, comparing the rotated points to their expected values.

2.

- Board Type: A Board is defined as a two-dimensional vector of boolean values, where true represents a live cell and false represents a dead cell.
- create_board: Initializes the board with a specified size and marks cells as live according to the provided live_cells coordinates. The board starts filled with false (dead cells), and the specified cells are set to true (live).
- count_neighbors: For any given cell specified by its (x, y) coordinates, calculates how many of its 8 neighbors are alive. It correctly wraps around the edges of the board.
- evolve: Produces the next generation of the board based on the current state. A cell's next state is determined by the number of live neighbors. A live cell with 2 live neighbors stays alive. A live or dead cell with 3 live neighbors becomes alive. In all other cases, a cell becomes or remains dead.
- test_count_neighbors: Verifies that count_neighbors correctly counts the live neighbors of cells at specific positions.
- main Function: Demonstrates creating an initial board, printing its state, evolving it through 10 generations, and then printing the final state. The initial state of the

board and its state after 10 generations are printed to the console, using a black box for live cells and a white box for dead cells