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CS 21 Project 2 Write-Up

The game should start with a single ‘2’ tile placed on the top-left corner on the 3x3 grid which is displayed on a 6x6 LED matrix in RIPES. Players use WASD keys to slide tiles up, left, down, right respectively, with tiles merging when identical values collide. After each valid move, a new ‘2’ tile spawns in a **random** empty cell. The game ends when either a 512 tile is created or no valid moves remain.

What has been implemented:

- Removed Components from Project 1:
  - Deleted entire menu system
  - Removed “Start from State” configuration feature
  - Eliminated text-based board printing
  - Removed `menu_input`, `adust_pos`, and `place_second` labels
  - Consolidated everything into `main`/`new_game` entry point
- Retained Core Game Mechanics from Project 1:
  - All movement resolution and application functions
  - Random tile spawning
  - Win condition check
  - Game over detection
- LED Matrix Implementation:
  - Implemented new `print_board` function that iterates through the 3x3 board and calculates LED positions using the formula: **(row×2×6 + col×2) × 4** to map each board tile to its corresponding 2x2 LED Block
  - Created `draw_tile` function with color mappings for all tile values
  - Offset 0: upper-left LED
  - Offset 4: upper-right LED
  - Offset 24: lower-left LED
  - Offset 28: lower-right LED