HW3: 8x8 LED matrix apple catch game

Goal

To design a non-blocking, interrupt-driven 8x8 LED matrix game where the player moves right or left to catch falling apples.

Design Summary

- The system uses external interrupts to detect two buttons (move left/right) for player movement.
- Hardware timer interrupt (Timer1) triggers periodic apple drops.
- EEPROM stores two values: a "magic" byte (for data validation) and the best score.
- The main loop operates asynchronously using flag variables (btnLeftPressed, btnRightPressed, dropAppleFlag) set by interrupt routines, enabling non-blocking updates of player position, apple movement, and scoring.
- The 8x8 LED matrix is used to show player position, falling apples and score.

Timing budget

- Timer interrupt period: ~0.9seconds (apple drop).
- Button debounce: 150 ms.

Test results

- Player movement responds correctly to button presses.
- Apples fall periodically from random columns.
- Score increments when player catches an apple.
- Lives decrement if apples reach bottom uncaught.
- Best score persists across power cycles using EEPROM.
- Non-blocking design ensures the game remains responsive during display updates.

Known issues

- Only two-digit scores are displayed on the LED matrix. The game cannot display scores > 99.