

# Assembly Project: Tetris

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## 1 Instruction and Summary

1. Which milestones were implemented?
  - Milestone 1: Completed
  - Milestone 2: Completed
  - Milestone 3: Completed
  - Milestone 4: Completed 8 EASY Milestones[**1.** gravity] [**2.** gravity speed up] [**3.** game over screen] [**4.** sound effect] [**5.** pause] [**6.** trigger] [**7.** random block] [**10.** next Tetris panel]
  - Milestone 5: Finished 8 EASY Milestones mentioned above.
2. How to view the game:
  - (a) Unit width in pixels: 8
  - (b) Display width in pixels: 128
  - (c) Display height in pixels: 256
  - (d) Base Address for Display: 0x10008000
3. Plan and Figures In general, our implementation revolves around storing the address of the starting point, the address of the keyboard input, and a buffer for storing the current game board in memory. Our main game loop encapsulates the entire game process. Within this loop, we start by plotting the game board and randomly generating several blocks. Subsequently, we enter a loop to handle the behavior of each generated Tetris individually.

For each Tetris, we perform several key tasks. Firstly, we check whether the termination condition is met. If so, we remove any completed lines by examining whether a line is entirely filled. If a line is filled, we replace it with the line above, adjusting the grid color as necessary. After this, we store the current view into a buffer for later use. Next, upon generating a Tetris, we wait for user input to move it. Movement behaviors are managed in a way that we redraw the last view before adding the Tetris, which is retrieved from the buffer. Subsequently, we verify if it's legal to move the Tetris to decide whether its position should be adjusted. Finally, we redraw the Tetris based on the updated position.

The loop for each individual Tetris terminates when the Tetris can no longer move further down. In such cases, a new Tetris is generated. The game ends if the line stack reaches a certain point.

- Within the gaming loop, we first plot the:
- This is when the Tetris moving:
- This is when game over:

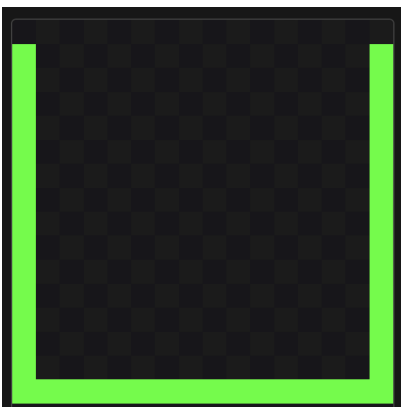


Figure 1: scene

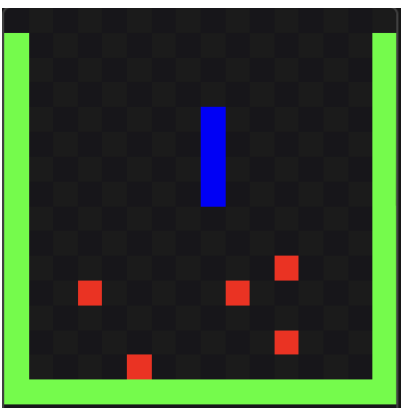


Figure 2: move

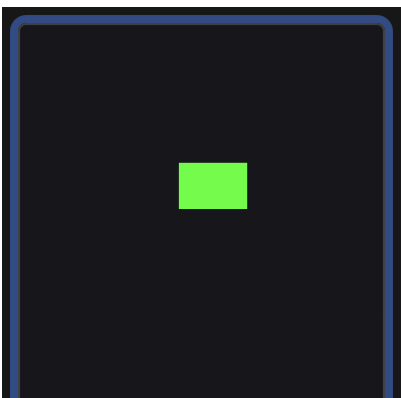


Figure 3: game over

#### 4. Game Summary:

- When the game begins, a random scene with some blocks will appear at the bottom of the screen.
- An "I"-shaped Tetris block will show up in the middle of the screen. Initially, it will move down one row per second, with the speed gradually increasing. The user can also control its movement by pressing keys: 'a' for left, 'd' for right, 'w' for clockwise rotation, and 's' for moving down. However, the user can only make legal moves, meaning the final destination of the Tetris must be within the board boundaries and not intersect with any other block or Tetris.
- When a line is completed, it will be removed, and the overall speed of the game will increase, making it

more challenging. The game will end if the line stack reaches a certain point. The user can press 'r' to restart the game.

- During gameplay, the user can press 'q' to quit the game or 'p' to pause the game. Pressing 'p' again will resume the game.

## 2 Attribution Table

Yifan Liu	Haochong Yang
Tetris & movement	Scene
Row elimination	Collision detection
Gravity	Sound effect
Game over & Pause	Game speed-up trigger
5 rows of random block	Preview panel