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Description:

This game is a clone of Tetris.

Controls:

- Left/Right Arrow: Move controlled tetromino left and right.
- Z/X: Rotate controlled tetromino clockwise and counterclockwise.
- C: Hold controlled tetromino
- Down Arrow: Soft drop controlled tetromino
- Space: Hard drop controlled tetromino
- Enter: Pause/Unpause

Basic rules:

- The objective is to score as many points as possible by creating solid rows using 7 unique tetrominos (blocks of 4 cells).
- Tetrominos fall from the top of the playing field and lock down after a short delay while touching the ground.
- The player can move tetrominos left, right, and down, but not up. The player can also rotate the tetrominos clockwise and counter-clockwise.
- Creating a solid row of tetrominos “scores” that row (line).
- Creating multiple lines at once awards more points.
- After creating 10 solid lines, the speed of the tetromino falling (level) will increase.
- If the stack of tetrominos reaches the top of the playing field, the game ends.

Advanced rules/mechanics:

- Tetrominos have a delay before locking down when touching ground. The delay can be reset by rotating or moving the tetromino. There is a limit to how many times this can be done before the tetromino locks down immediately.
- Tetrominos can be “held”, allowing tetrominos to be swapped out when needed. Tetrominos cannot be held more than onceafter holding/swapping a tetromino, the controlled tetromino must be locked down before another tetromino can be held.

Specific Tetris Guideline Mechanics

- Gameplay is mostly designed around the 2009 Tetris Design Guideline published by the Tetris Company.
- A copy of the guideline is included next to this file.
- Some of the Tetris Guideline mechanics included in this clone are (with section numbers):
    - (3.1) Tetromino shapes & colors
    - (3.4) Tetromino starting location & orientation
    - (2.4.4) Ghost tetromino
    - (2.4.1) Visible playfield size
    - (10.0) Playfield vertical buffer zone
    - (3.3) "Bag system" random tetromino generation
    - (5.3) "Super Rotation System", allowing rotation against walls and surfaces (wall-kicks, t-spins)
    - (5.4) Hard Drop
    - (5.5) Soft Drop
    - (5.6) Hold
    - (5.7) Extended placement lock down

Issues Encountered:

- Using the OnKeyDown event for controls gave little control when handling a held-down key - the initial delay and rate of repeating was not controllable.
    - Solved by tracking the pressed state of the key and implementing custom logic based on that.
- Initial issues were encountered with collision and rendering - if the playfield in memory (the array matrix) is considered to be from top to bottom, then the rendering of the field is from bottom to top. This caused bugs since the vertical flip was hard to visualize in code.
    - This issue was not “solved” since it is just a discrepancy between the in-code representation and the graphical representation in-browser, but it was acclimated to, helping diagnose and avoid bugs.
- Difficulty was encountered when trying to get a custom font to load and display correctly in the HTML canvas element.
    - This was eventually solved by figuring out how to correctly load the font for usage in canvas.
- Difficulty was encountered here and there when trying to implement Tetris Guideline mechanics - figuring out how to implement the mechanics in code proved to be challenging at times.
    - Most mechanics were figured out personally, but some mechanics such as the Super Rotation System needed research before the concept “clicked” - for example, the key idea that helped me understand Super Rotation System was that it works by testing 5 possible positions+offsets, and picking the first position that worked.

Screenshots/Video:

Additional screenshots and video are provided in this repository.