Application Requirements Specification

For

<Tetris Game>

Prepared By:

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Purpose and Scope Statement

The application is a Tetris Game where players manipulate falling tetromino shapes to complete lines and score points. The application will be developed using Java programming language and Swing for the graphical user interface.

Requirements Narrative

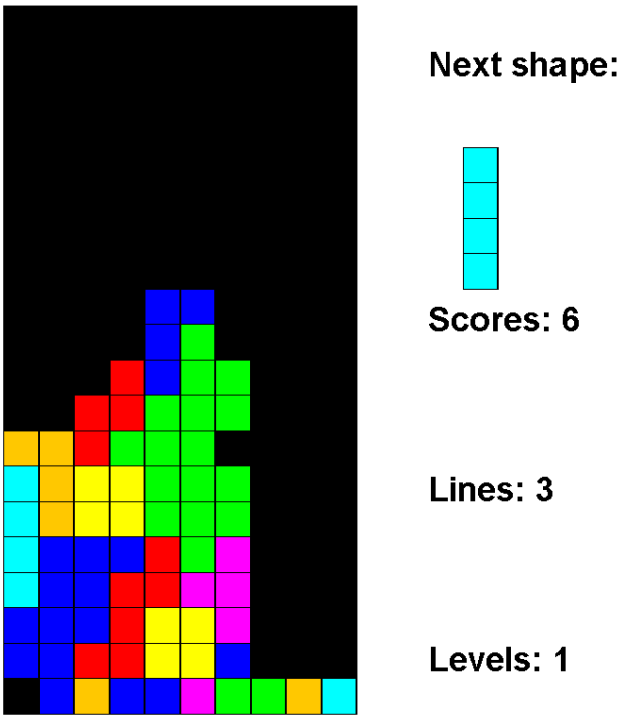
The Tetris Game will have the following features:

1. Start Game: When the user runs the application, the game will automatically start.
2. Move and Rotate Shapes: Users can move and rotate the falling shapes using the arrow keys on their keyboard.
3. Next Shape: Users can see the next shape that will appear on the right panel.
4. Clear Lines: Users can earn points by clearing lines. When a horizontal line is filled with blocks, it will disappear, and any blocks above it will fall down.
5. Lines & Scores: During gameplay, users can view their current score and the number of lines they have cleared. This information will be displayed on the game screen.
6. Levels: The game will have different levels of difficulty. As users progress through levels, the speed at which the shapes fall will increase.
7. Game Over: The game will end when the shapes reach the top of the screen, and there is no more space to fit the new shapes.
8. New Game: When the game is over, a prompt will appear asking the user if they want to start a new game or close the game.

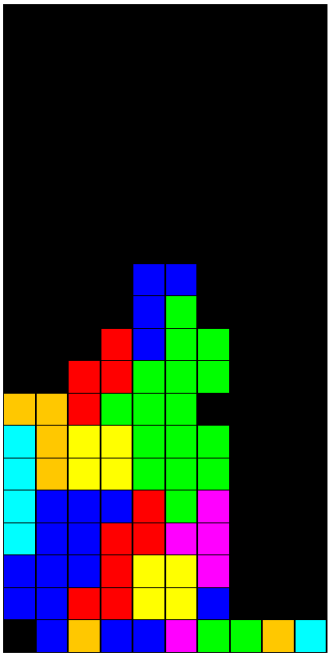
These features will provide users with a fun and challenging gaming experience while also providing a way to track their progress and achievements.

Objectives

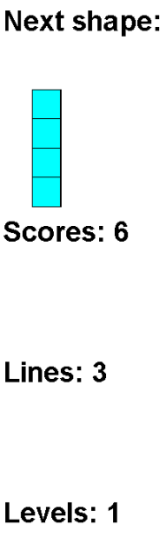
The main game screen is shown below:



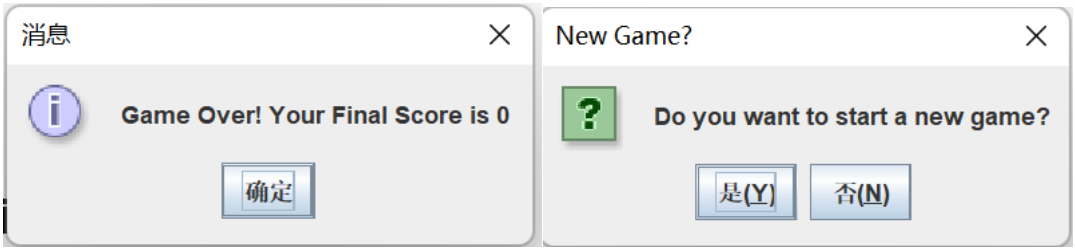
The Game Board is shown below:



The screen for displaying scores, lines and levels is shown below:



The screen when the game is over is as below:



Functional Specification

The program will have the following functionality:

1. Main Game Screen: Upon launching the game, users will be presented with the main game screen that displays the game board, next shape, score, lines cleared, and level.
2. Game Board: The game board will be a rectangular grid with a fixed width and height where the shapes will fall. The game board will be displayed on the main game screen.
3. Tetromino Shapes: There will be seven different types of tetromino shapes, each with its unique color, and they will fall from the top of the screen one at a time. The shapes will be generated randomly.
4. Movement and Rotation: Users can move the shapes left or right using the left and right arrow keys on their keyboard. The down arrow key can be used to accelerate the speed of the falling tetromino shapes. The up arrow can rotate the shapes.
5. Line Display: The number of lines cleared by the user will be displayed on the main game screen. Each time the user clears a line, the number of lines cleared will be updated in real-time.
6. Score Display: The score earned by the user will be displayed on the main game screen. The score will be calculated based on the number of lines cleared and the level of difficulty of the game.
7. Level Display: The level the user is currently playing will be displayed on the main game screen. The level will be increased as the user earns more scores. Each level increase will cause the tetromino shapes to fall faster, making the game more challenging.
8. Game Over: The game will end when the tetromino shapes reach the top of the screen, and there is no more space to fit the new shapes. The game over screen will display the user's final score and the option to restart the game or close the game.

Classes Needed

The basic classes needed for the application are:

1. Tetris Class: The program defines a class named Tetris that extends the Window class. The class contains various variables and methods for managing the game. The main functions of the game are implemented in this class.
2. Window Class: This class extends JPanel and implements three different types of event listeners: MouseListener, MouseMotionListener, and KeyListener. It is designed to be used as the main window for Tetris game.
3. G class: It includes some utility functions and nested classes for working with graphics and geometric shapes.

Technologies Needed

1. Java programming language
2. GUI- Swing

Logic Specification