Design Overview for FlappyCircle

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Summary of Program

Simple 2D side-scrolling game Flappy Circle based on Flappy Bird was created in C# using the SplashKitSDK. The software is structured into three primary classes: Bird, Pipe, and Game, and it adheres to the Object-Oriented Programming (OOP) concepts.

The player's bird character is represented by the Bird class. It includes location, velocity, and gravity information for the bird. The class offers ways to sketch the bird on the screen and update its position when it flaps.

The challenges that the bird must overcome are represented by the Pipe class. Each pipe contains a flag to show if the bird has passed through it and is marked with its location. The class offers ways to draw the pipe on the screen and update the pipe's location as it goes to the left.

The game's state and interactions are controlled by the Game class. The game scene is shown on the screen, the user input is handled, and the game entities (the bird and pipes) are updated. The game loop in the class lets the player navigate the bird around by pressing the spacebar as the game components are updated and drawn continually.

When the game first starts, the player may move the bird by pressing the spacebar to cause it to flap, allowing it to avoid hitting the pipes. The game loop modifies the bird's location, moves the pipes, and monitors the screen for pipe or boundary collisions. A "Game Over!" notice appears on the screen when the player loses the game by hitting a pipe or leaving the screen. By using the space key, the player can then start the game over.

By categorizing the game components into different classes and utilizing inheritance and abstraction to handle common behavior, the software exemplifies effective OOP design. By encapsulating the internal state of the bird and pipe objects, it adheres to encapsulation, and polymorphism is done using the GameObject base class, allowing for a standardized method of updating and drawing various game elements.

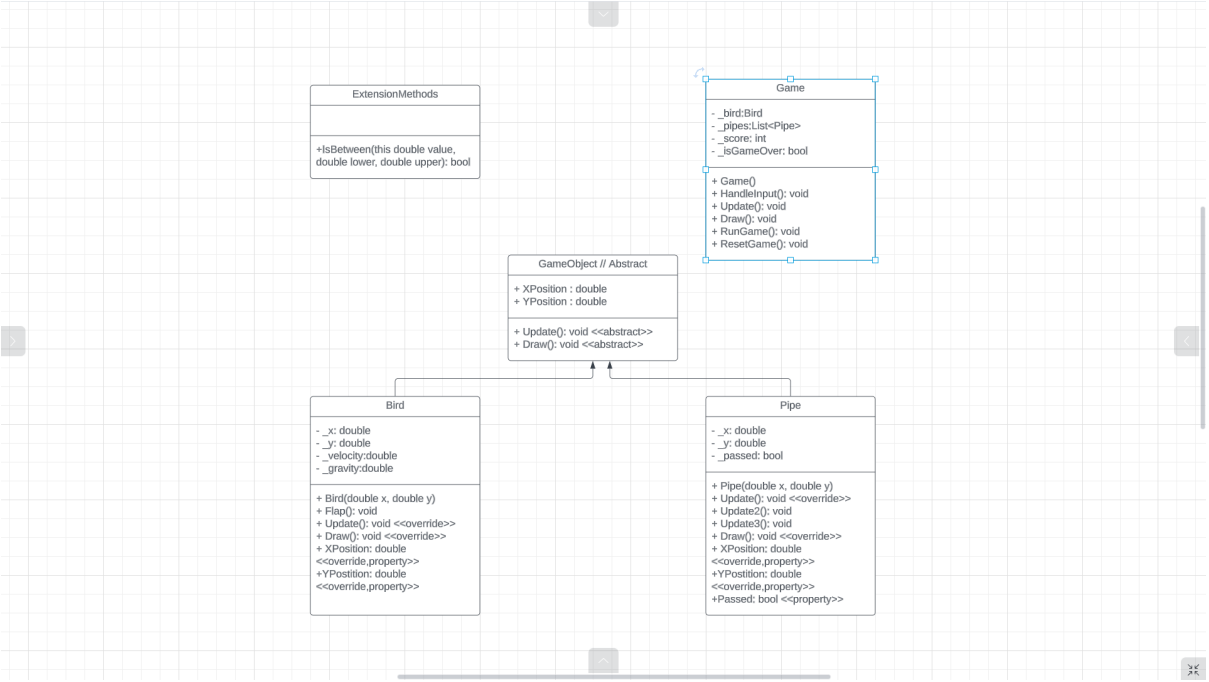
Overall, the Flappy Circle game software offers a fun and engaging experience while demonstrating OOP concepts for maintainability and code structure. The difficulty of getting the bird through the pipes may be enjoyed by players, who can also try for the maximum score.

Required Roles

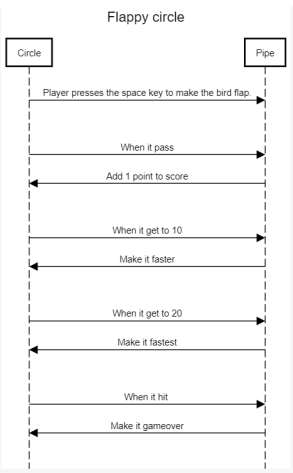
Responsibility	Type Details	Notes
Bird	The circle or bird in my game	Need some Flap function and gravity to pull it when not flap
Pipe	Green pipes like the original FlappyBird	Move faster with 3 levels based on the score milestone
Game	Run all functions and objects which are added into the game	Most difficult one because it required logic

Value	Notes
Position	Using double
If passed	Boolean to confirm add point
Score	Integer to count point

Class Diagram



Sequence Diagram


Flappy circle
Circle
Pipe
Player presses the space key to make the bird flap.
When it pass
Add 1 point to score
When it get to 10
Make it faster
When it get to 20
Make it fastest
When it hit
Make it gameover