**PONG-CLONE USING SFML**

**Introduction**

This project is a clone of the 1972’s arcade game – “Pong”. This is a two-player game where players are supposed to control their bats or paddles using keyboard inputs. The goal is to score 10 points before the opponent.

**Code Details**

The program is made up of two classes: “Game” class and “Menu” class. The game class is responsible for everything happening in the game, that is, displaying the game window, handling input, managing collisions, handling game loop, etc. The menu class is responsible for displaying the menu in the beginning of the game and after every round until the program is closed.

**Menu Class:**

The menu class is responsible for displaying the main menu of the game in the beginning and after every round. It consists of four methods: InitTitle, InitInst, GetTitleText, GetInstructionText. The InitTitle and InitInst are used to initialise the title text and the instructions text, respectively, that will be shown in the main menu. The GetTitleText and GetInstructionText methods return the text object which will later be used from in the Game class to display the text on the game window.

**Game Class:**

The Game Class is responsible for everything that happens in the game. It initializes the window, updates the window based on the player input and object behaviour, calculates, and displays score and manages the entire game loop. Here is the list of methods and their functions:

|  |  |  |
| --- | --- | --- |
| **Method** | **Return Type** | **Function** |
| Game | constructor | Calls all the Init functions, creates a new menu object. |
| ~Game | destructor | Deletes all the objects once the program ends. |
| InitWindow | void | Initializes a game window |
| InitBatOne | void | Initializes a bat object of cyan colour of type ‘RectangleShape’ |
| InitBatTwo | void | Initializes a bat object of green colour of type ‘RectangleShape’ |
| InitBall | void | Initializes a ball of type ‘CircleShape’ |
| InitText | void | Initializes text to update players’ scores |
| PollEvents | void | Checks every frame for an event where the player presses the close window button or ‘Esc’ key on the keyboard |
| IsRunning | bool | Returns if the window is open or closed |
| isGameOn | bool | Returns ‘gameON’ |
| UpdateBatOnePos | void | Updates cyan bat position based on player’s input |
| UpdateBatTwoPos | void | Updates green bat position based on player’s input |
| IntersectsBatOne | bool | Checks if cyan bat collides with the ball |
| IntersectsBatTwo | bool | Checks if green bat collides with the ball |
| ResetBall | void | Resets ball position and speed if a player misses the ball |
| UpdateBallPos | void | Updates ball direction and position after every collision. Also increases the speed if the ball collides a bat |
| UpdateOneScore | void | Updates Player 1’s score object if Player 2 misses |
| UpdateTwoScore | void | Updates Player 2’s score object if Player 1 misses |
| Update | void | Calls all the update objects if gameOn = true. Else, takes player input, if “space bar” key is pressed, gameOn is changed to true and the game begins |
| Render | Void | Draws menu if gameOn = false, else draws all the game objects |

**Inputs**

When the main menu is displayed, press ‘space bar’ key to begin the game. When on the gameplay screen, press ‘A’ and ‘D’ keys to move the cyan bat, and ‘left arrow’ and ‘right arrow’ keys to move the green bat.

**Outputs**

Once the program starts running, a window of size 1360x760 is created. Once created, the menu of the game is displayed showing the title and instructions. Once the game starts, cyan and green bats are placed at the bottom and top of the windows respectively. ‘A’ and ‘D’ keys move the cyan bat to left and right whereas ‘Left arrow’ and ‘Right arrow’ move green bat to left and right, respectively.

**Known Issues**

One bug in the game is that, when the ball comes in contact to the edges of the bat (corners and left and right sides), the ball tends to pass through the bat, causing multiple collisions, resulting in an unfair amount of speed increase in an instant.