This program is an imitation of Bubble Struggle game. There are 6 classes which is Environment, Ball, Player, Arrow, Bar and Main class. I will explain them one by one.

In Environment class there are some constants and objects of other classes and getters and setters of some attributes. I initially set up the canvas. Then, created first three balls. Adding new balls in a list is done in this class, too. The game runs in this class to be repeatable. Whilerunning game it checks ball-arrow intersections, ball-player intersections and whether the time is up or not. If one of them is met, game will be over and game over screen will pop up. Game over screenis also drawn in Environment class. Besides that, most of the drawings is done in while loop.

In Ball class there are attributes of the ball and their getters and setters. In the constructor I defined the position, level, radius, maximum height, and the direction of the ball. Methods of the collisions with the walls of the canvas, ball-arrow intersections and ball-player collisions is in this class. I considered the nearest point on the ball to the player, and I assumed the player is a rectangle. When this nearest point is smaller than the radius of the ball, there is an intersection. Same for arrow. Lastly, the method of drawing the ball on the canvas is in this class. It checks the boundaries and updates the position of the ball then draws it.

In Player class there are attributes of the player and their getters and setters. I created a method to move the player and keep it within boundaries of the canvas. It moves according to the keyboard input. There is also a method to shoot an arrow when it is inactive. If arrow is active, this method won’t run. Lastly, there is a method to draw the player on the canvas.

In Arrow class there are attributes of the arrow and their getters and setters. Also, method of drawing arrow is this class. In this method firstly I take the time when the arrow is shot and updated the position and the scales of the arrow according to the time passed. It takes 1.5 second to go from bottom to top.

In Bar class there are attributes of the bar and time bar and setters of some of them. Firstly, I displayed the bar. Then, I drew the time bar that shrinking and changing color as the time goes. It takes 40 seconds to run out. Lastly, the method that checks whether time is out or now is in this class.

In Main class there is main method and the method that restarts the game. In this method I created the environment object and set up the canvas. Then I enable double buffering for faster animations. Then I run the game by using environment object and called the method that restarts the game in a while loop. In restart method it draws the end game screen when the game is over by using win condition parameter. Then, if player clicks Y, the array list that contains the balls will be cleared and the system time will be reset, and the game will restart. If player click N, the program will be terminated, and the canvas will close.