Assignment 1: Breakout ATARI

# Problem Statement

Develop a primitive version of the classic game ATARI, with one brick, a moving ball and a slider to control movement of the ball. The game should also have a clock to track the time played.

# Solution

## Approach

To solve this problem, we implement an object-oriented approach. We have modularized the code into separate classes for the Brick, Ball, Slider, Clock and a Breakout class to create instances of the other classes. We are using JavaFX libraries for creating the graphics of the game.

## Description of Classes

### Ball

This class contains the method and the instance variables related to the ball. Below is the description of the methods:

1. moveBall: This method handles the movement of the ball.
2. getCircle():This method gets the JavaFX Circle object from the ball object.
3. isLeftRightCollide: This method checks if the ball is touching the left or right boundaries of the screen.
4. isUpDownCollide: This method checks if the ball is touching the top or bottom boundaries of the screen.
5. changeDirection: This method changes direction of the ball when it hits the boundaries.
6. isSliderCollide: This method checks if the ball is colliding with the slider.
7. handleBrickCollision: This method handles collision of the ball with the brick.

### Slider

This class contains the method and the instance variables related to the slider. Below is the description of the methods:

1. moveSlider: This method handles the movement of the slider.
2. isBoundary: This method checks if the slider is at the panel boundary.
3. toggleSliderDirection: This method toggles the direction of the slider.
4. isCollide: This method checks if the slider is colliding with the ball.
5. getRectangle: This method gets the JavaFX Rectangle object from the Slider object.

### Brick

This class contains the method and the instance variables related to the Brick. Below is the description of the methods:

1. isCollision: This method checks if the brick is colliding with the ball.
2. isLeftCollision: This method checks if the ball is colliding on the left side of the brick.
3. isRightCollision: This method checks if the ball is colliding on the right side of the brick.
4. isTopCollision: This method checks if the ball is colliding on top of the brick.
5. isBottomCollision: This method checks if the ball is colliding at the bottom of the brick.
6. getRectangle: This method gets the JavaFX Rectangle object from the Brick object.
7. killBrick: This method sets the isDead flag in the brick, once the brick is exploded by the ball.

### Clock

This class contains the method and the instance variables related to the slider. Below is the description of the methods:

1. configureHbox: This method creates boxes to show the digits of the timer.
2. configureDigits: This method creates and configures the digits and the background of the boxes.
3. createBackground: This method creates the layout.
4. refreshDigits: This method refreshes the timer after 60 seconds.
5. runClock: This method calculates the time and updates the count for the time.

### Breakout

This class contains the method and the instance variables related to the full Breakout game. Below are the description of the methods:

1. createMultipleBlocks: This method creates multiple blocks in the breakout game
2. addHBox: This method adds a horiziontal panel for the clock.
3. startBreakout: This method starts the breakout game, creating all objects, adding into the panel, handling keypress events.