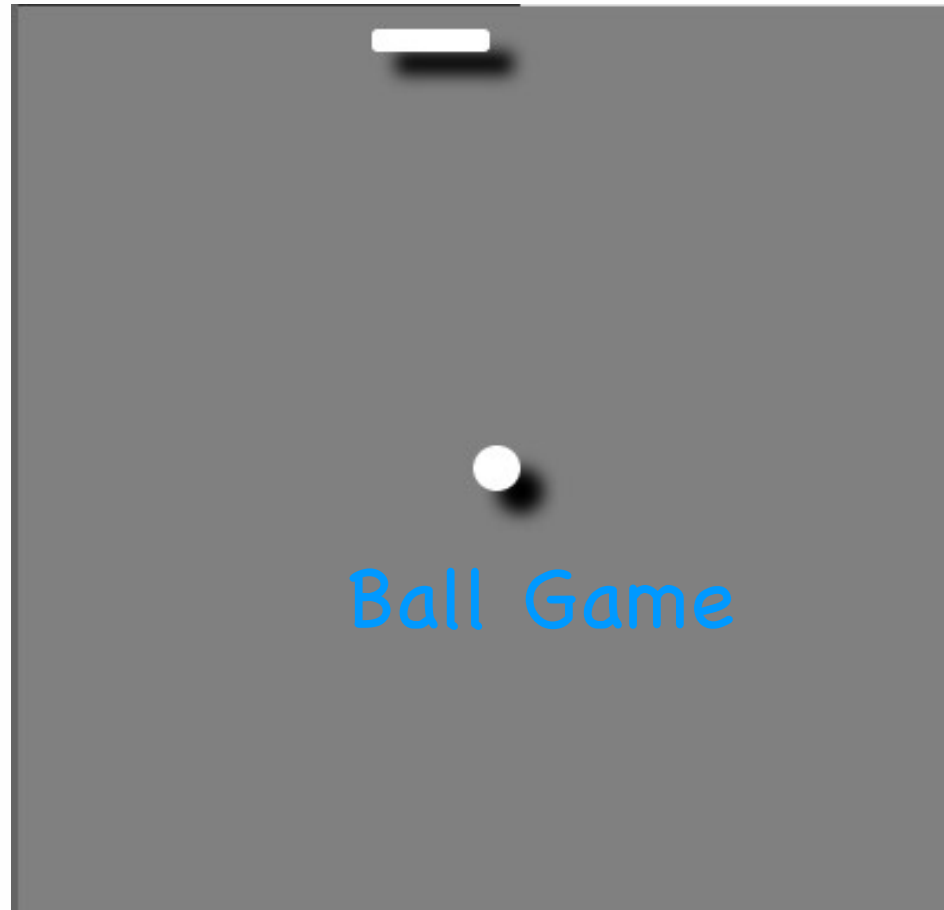


JavaFX Example



Goals

- Show Animation (TimeLine)
- Show Keyboard interaction
- Challenge you



Create Application

- Create a new JavaFX application



Create the Playing Field

```
def playingField = Rectangle {  
  width: 400, height: 400  
  fill: Color.GRAY  
}
```

```
Stage {  
  title: "Ball Game"  
  scene: Scene {  
    content: [  
      playingField  
    ]  
  }  
}
```



Add a Paddle

```
var paddle = Rectangle {  
    x: 150, y: 10  
    width: 50, height: 10  
    arcWidth:5, arcHeight: 5  
    fill: Color.WHITE  
}
```



Add a Ball

```
var ball = Circle {  
    centerX: 200, centerY: 200  
    radius: 10  
    fill: Color.WHITE  
}
```



Make the Paddle Move

- The background playing field handles the key press

```
playingField.requestFocus();
```

- Add the key handling function to the playing field rectangle

```
onKeyPressed: function (e: KeyEvent): Void {  
  if (e.code == KeyCode.VK_LEFT and paddle.x > 0) {  
    paddle.x -= 10;  
  }  
  
  if (e.code == KeyCode.VK_RIGHT and paddle.x < 350) {  
    paddle.x += 10;  
  }  
}}
```



Create a Game Clock

- Use Timeline to make it tick

```
def pulse = 10ms;
var anim: Timeline = Timeline {
    repeatCount: Timeline.INDEFINITE
    keyFrames: [
        KeyFrame {
            time: pulse
            canSkip: true
            action: function () {
                gameUpdate();
            }
        }
    ]
};

anim.play();
```

- The function `gameUpdate` is called every 10ms



Move the Ball

```
var ballSpeedX = 1.5;  
var ballSpeedY = 1.5;  
function gameUpdate(): Void {  
    ball.centerX += ballSpeedX;  
    ball.centerY += ballSpeedY;  
}
```

- Start the game. What happens with the ball?



Keep the Ball Inside

```
if (ball.centerX > playingField.width or ball.centerX < 0)
{
    ballSpeedX *= -1;
}
if (ball.centerY > playingField.height) {
    ballSpeedY *= -1;
}
```



Check for Paddle Hit

```
if (paddle.contains(ball.centerX, ball.centerY)) {  
    ballSpeedY *= -1;  
}
```

- Primitive collision detection
 - Means room for improvement



Challenge

- Extend the Game
 - Invent a goal for the game, e.g.
 - Time ball has been in play
 - Targets to hit
 - Two-player game like table tennis
 - Keep a score count on screen
 - Create a high score list
 - Or ladder for multiplayer

