22 JavaFX Graphics and Multimedia

Objectives

In this chapter you'll:

- Use JavaFX graphics and multimedia capabilities to make your apps "come alive" with graphics, animations, audio and video.
- Use external Cascading Style Sheets to customize the look of `Node`s while maintaining their functionality.
- Customize fonts attributes such as font family, size and style.
- Display two-dimensional shape nodes of types `Line`, `Rectangle`, `Circle`, `Ellipse`, `Arc`, `Path`, `Polyline` and `Polygon`.
- Customize the stroke and fill of shapes with solid colors, images and gradients.
- Use `Transform`s to reposition and reorient nodes.
- Display and control video playback with `Media`, `MediaPlayer` and `MediaView`.
- Animate `Node` properties with `Transition` and `Timeline` animations.
- Use an `AnimationTimer` to create frame-by-frame animations.
- Draw graphics on a `Canvas` node.
- Display 3D shapes.

Outline

1. 22.1 Introduction
2. 22.2 Controlling Fonts with Cascading Style Sheets (CSS)
    1. 22.2.1 CSS That Styles the GUI
    2. 22.2.2 FXML That Defines the GUI—Introduction to XML Markup
    3. 22.2.3 Referencing the CSS File from FXML
    4. 22.2.4 Specifying the `VBox`'s Style Class
    5. 22.2.5 Programmatically Loading CSS
3. 22.3 Displaying Two-Dimensional Shapes
    1. 22.3.1 Defining Two-Dimensional Shapes with FXML
    2. 22.3.2 CSS That Styles the Two-Dimensional Shapes
4. 22.4 `Polyline`s, `Polygon`s and `Path`s
    1. 22.4.1 GUI and CSS
    2. 22.4.2 `PolyShapesController` Class
5. 22.5 Transforms
6. 22.6 Playing Video with `Media`, `MediaPlayer` and `MediaViewer`
    1. 22.6.1 `VideoPlayer` GUI
    2. 22.6.2 `VideoPlayerController` Class
7. 22.7 `Transition` Animations
    1. 22.7.1 `TransitionAnimations.fxml`
    2. 22.7.2 `TransitionAnimations-Controller` Class

8. 22.8 `Timeline` Animations
9. 22.9 Frame-by-Frame Animation with `AnimationTimer`
10. 22.10 Drawing on a `Canvas`
11. 22.11 Three-Dimensional Shapes
12. 22.12 Wrap-Up
    1. Summary
    2. Self-Review Exercises
    3. Answers to Self-Review Exercises
    4. Exercises