

## 12.7 Wrap-Up

In this chapter, we introduced JavaFX. We presented the structure of a JavaFX stage (the application window). You learned that the stage displays a scene graph, that the scene graph is composed of nodes and that nodes consist of layouts and controls.

You designed GUIs using visual programming techniques in JavaFX Scene Builder, which enabled you to create GUIs without writing any Java code. You arranged `Label`, `ImageView`, `TextField`, `Slider` and `Button` controls using the `VBox` and `GridPane` layout containers. You learned how class `FXMLLoader` uses the FXML created in Scene Builder to create the GUI.

You implemented a controller class to respond to user interactions with `Button` and `Slider` controls. We showed that certain event handlers can be specified directly in FXML from Scene Builder, but event handlers for changes to a control's property values must be implemented directly in the controllers code. You also learned that the `FXMLLoader` creates and initializes an instance of an application's controller class, initializes the controller's instance variables that are declared with the `@FXML` annotation, and creates and registers event handlers for any events specified in the FXML.

In the next chapter, you'll use additional JavaFX controls and

layouts and use CSS to style your GUI. You'll also learn more about JavaFX properties and how to use a technique called data binding to automatically update elements in a GUI with new data.