Chapter 16
JavaFX UI Controls

Motivations

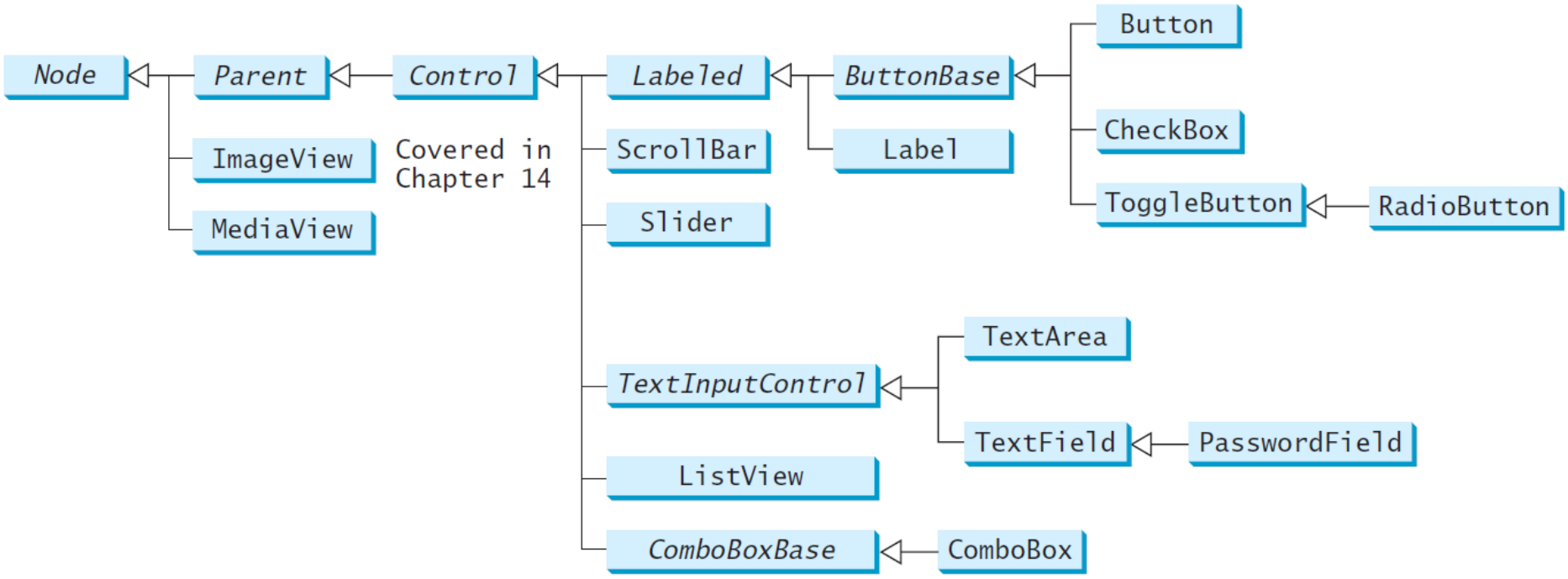
A graphical user interface (GUI) makes a system user-friendly and easy to use. Creating a GUI requires creativity and knowledge of how GUI components work. Since the GUI components in Java are very flexible and versatile, you can create a wide assortment of useful user interfaces.

Previous chapters briefly introduced several GUI components. This chapter introduces the frequently used GUI components in detail.

Objectives

- To create graphical user interfaces with various user-interface controls (§§16.2–16.11).
- To create a label with text and graphic using the **Label** class and explore properties in the abstract **Labeled** class (§16.2).
- To create a button with text and graphic using the **Button** class and set a handler using the **setOnAction** method in the abstract **ButtonBase** class (§16.3).
- To create a check box using the **CheckBox** class (§16.4).
- To create a radio button using the **RadioButton** class and group radio buttons using a **ToggleGroup** (§16.5).
- To enter data using the **TextField** class and password using the **PasswordField** class (§16.6).
- To enter data in multiple lines using the **TextArea** class (§16.7).
- To select a single item using **ComboBox** (§16.8).
- To select a single or multiple items using **ListView** (§16.9).
- To select a range of values using **ScrollBar** (§16.10).
- To select a range of values using **Slider** and explore differences between **ScrollBar** and **Slider** (§16.11).
- To develop a tic-tac-toe game (§16.12).
- To view and play video and audio using the **Media**, **MediaPlayer**, and **MediaView** (§16.13).
- To develop a case study for showing the national flag and play anthem (§16.14).

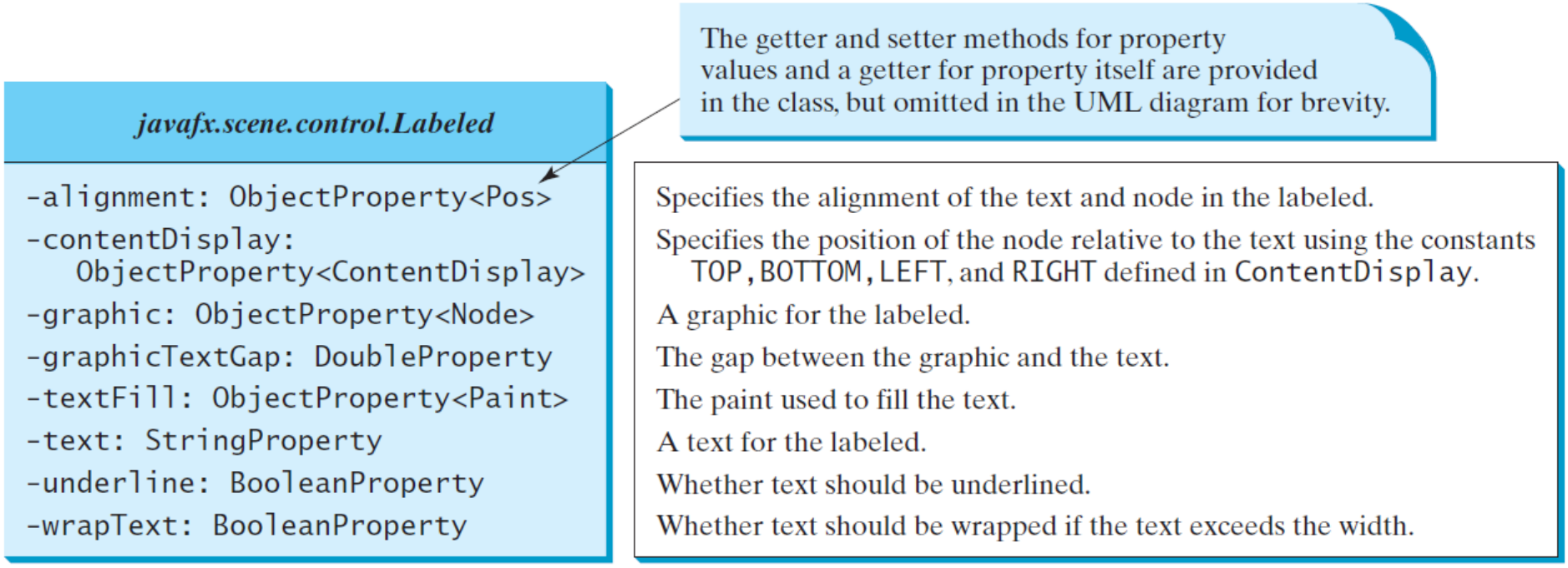
Frequently Used UI Controls



Throughout this book, the prefixes **lbl**, **bt**, **chk**, **rb**, **tf**, **pf**, **ta**, **cbo**, **lv**, **scb**, **sld**, and **mp** are used to name reference variables for **Label**, **Button**, **CheckBox**, **RadioButton**, **TextField**, **PasswordField**, **TextArea**, **ComboBox**, **ListView**, **ScrollBar**, **Slider**, and **MediaPlayer**.

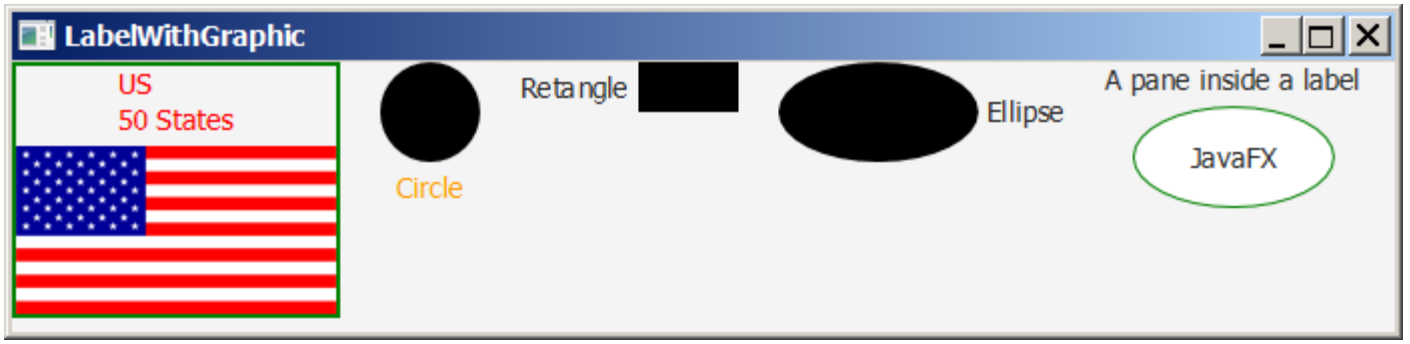
Labeled

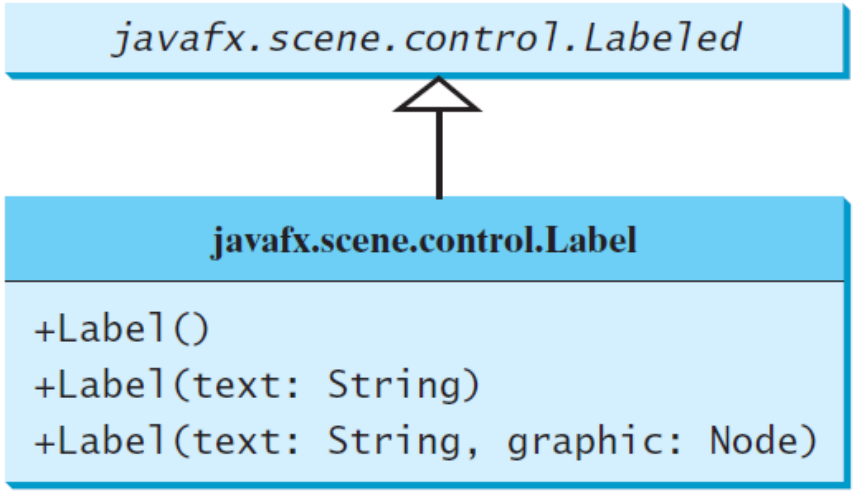
A *label* is a display area for a short text, a node, or both. It is often used to label other controls (usually text fields). Labels and buttons share many common properties. These common properties are defined in the **Labeled** class.



Label

The Label class defines labels.



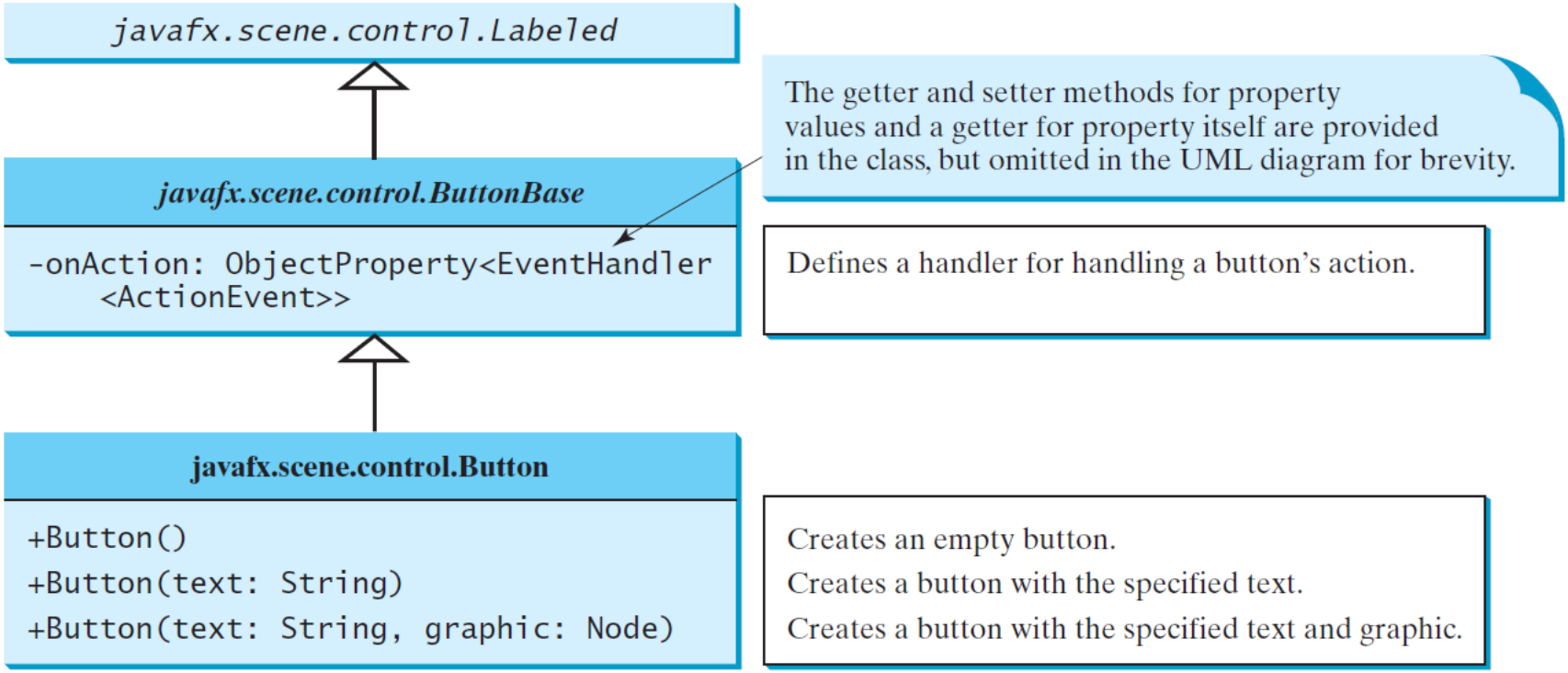


Creates an empty label.
Creates a label with the specified text.
Creates a label with the specified text and graphic.

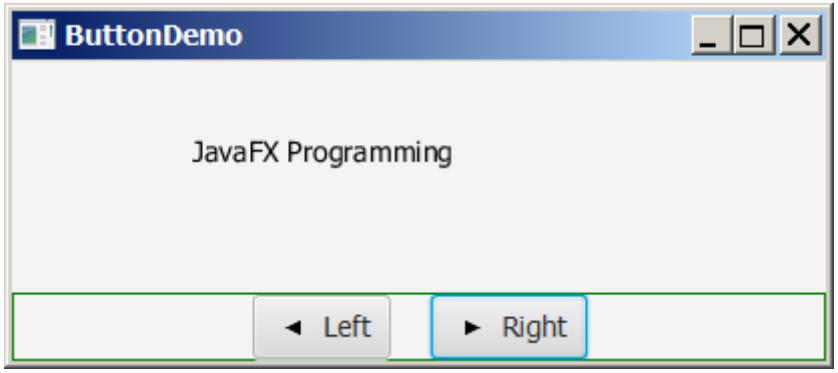
LabelWithGraphic Run

ButtonBase and Button

A *button* is a control that triggers an action event when clicked. JavaFX provides regular buttons, toggle buttons, check box buttons, and radio buttons. The common features of these buttons are defined in **ButtonBase** and **Labeled** classes.

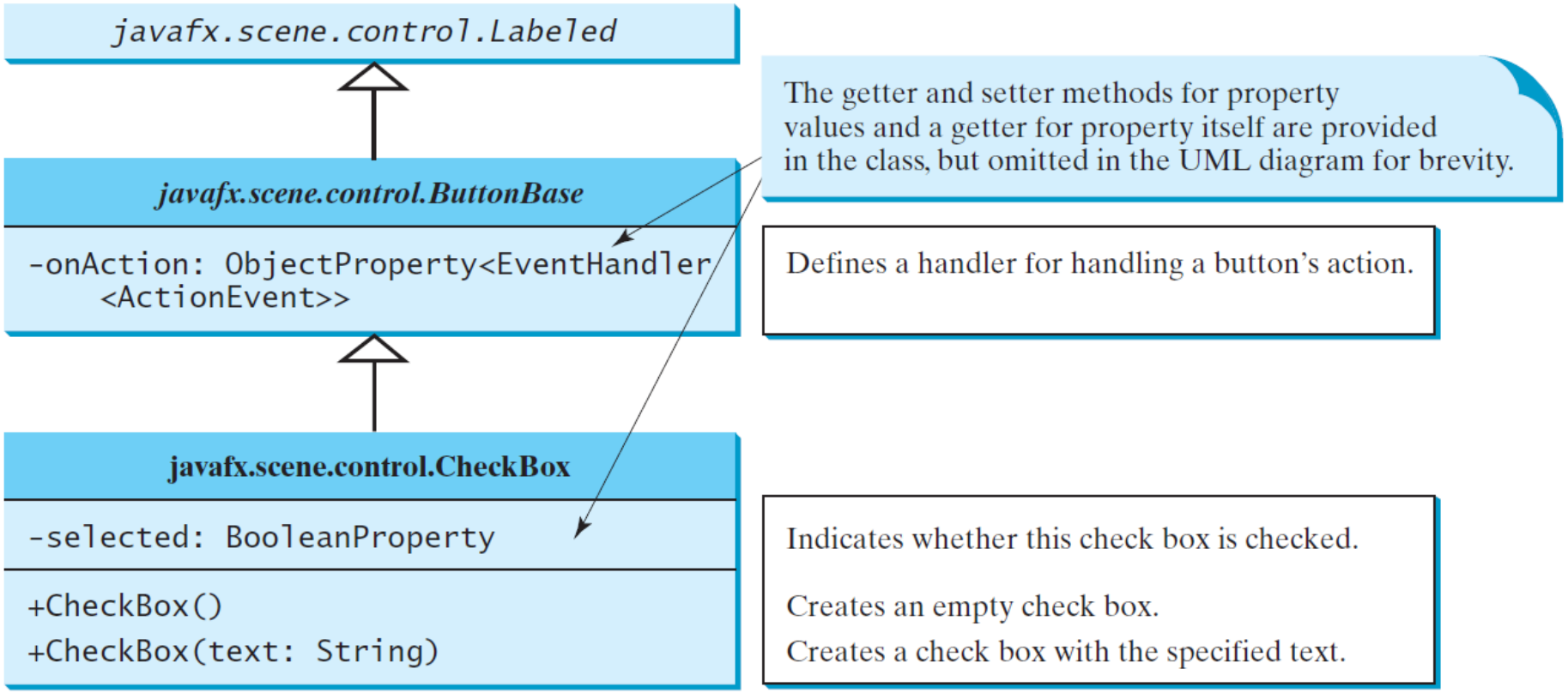


Button Example

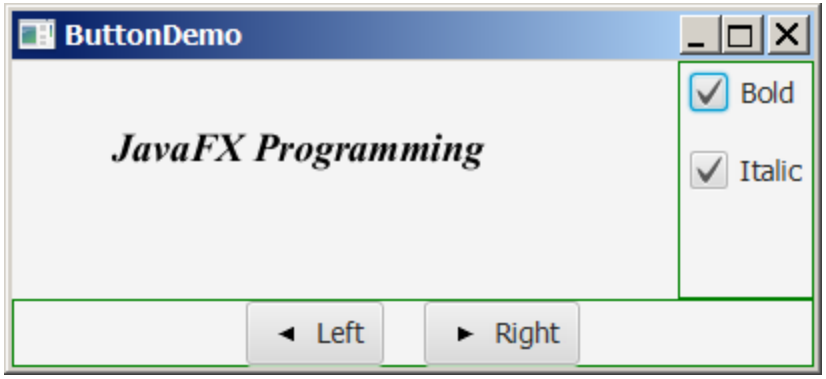


CheckBox

A **CheckBox** is used for the user to make a selection. Like **Button**, **CheckBox** inherits all the properties such as **onAction**, **text**, **graphic**, **alignment**, **graphicTextGap**, **textFill**, **contentDisplay** from **ButtonBase** and **Labeled**.



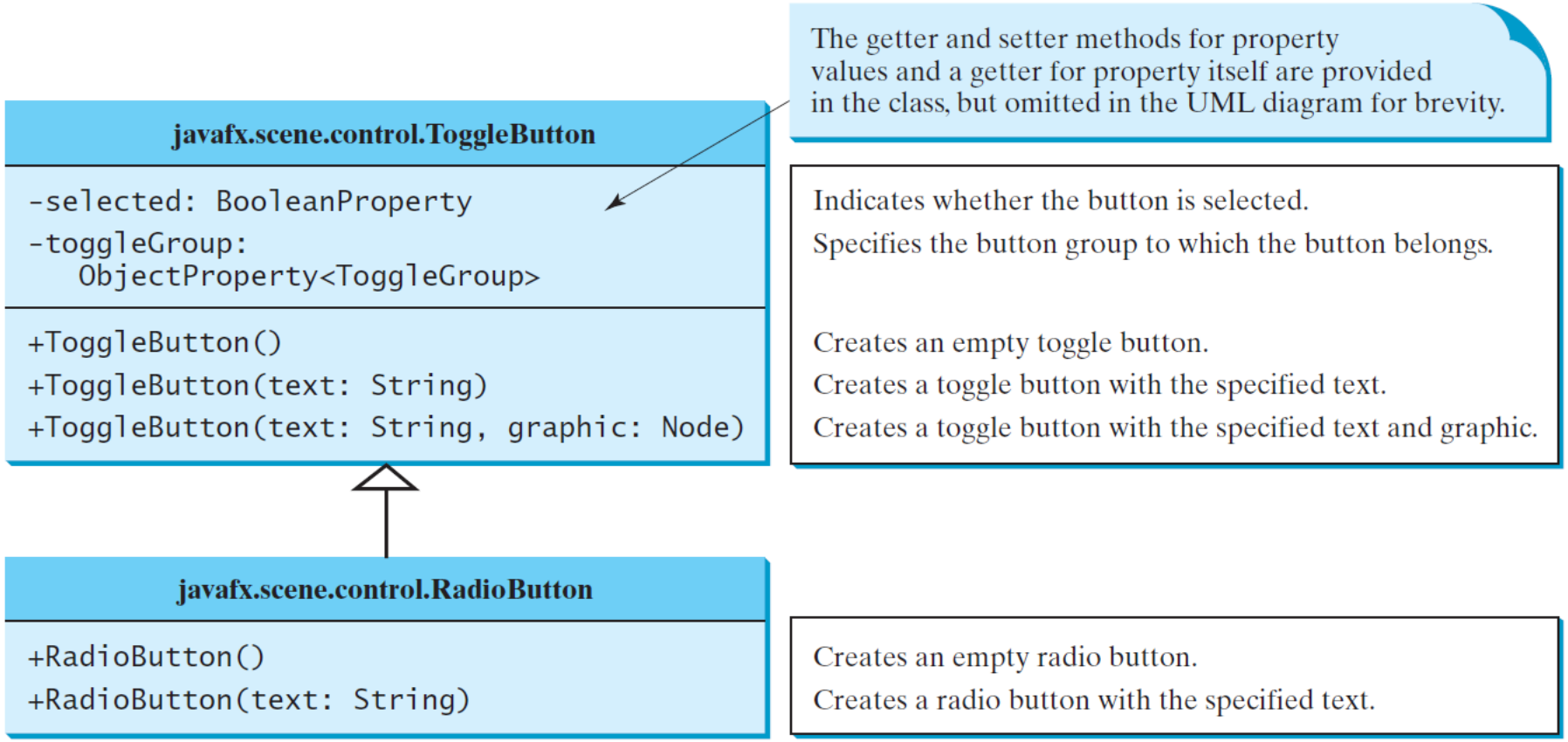
CheckBox Example



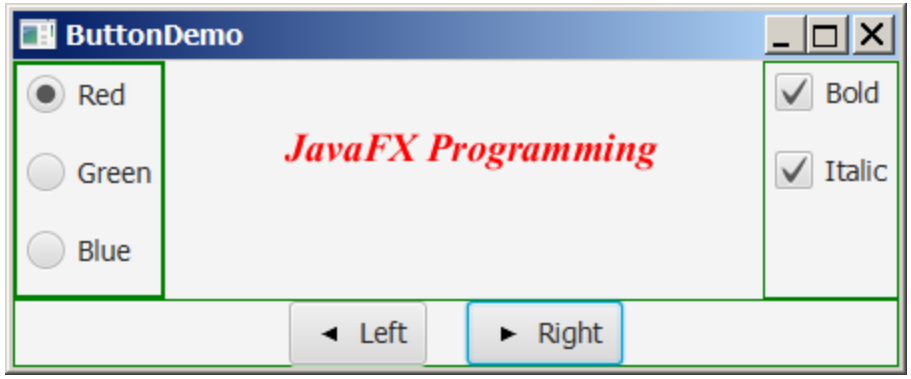
CheckBoxDemo Run

RadioButton

Radio buttons, also known as *option buttons*, enable you to choose a single item from a group of choices. In appearance radio buttons resemble check boxes, but check boxes display a square that is either checked or blank, whereas radio buttons display a circle that



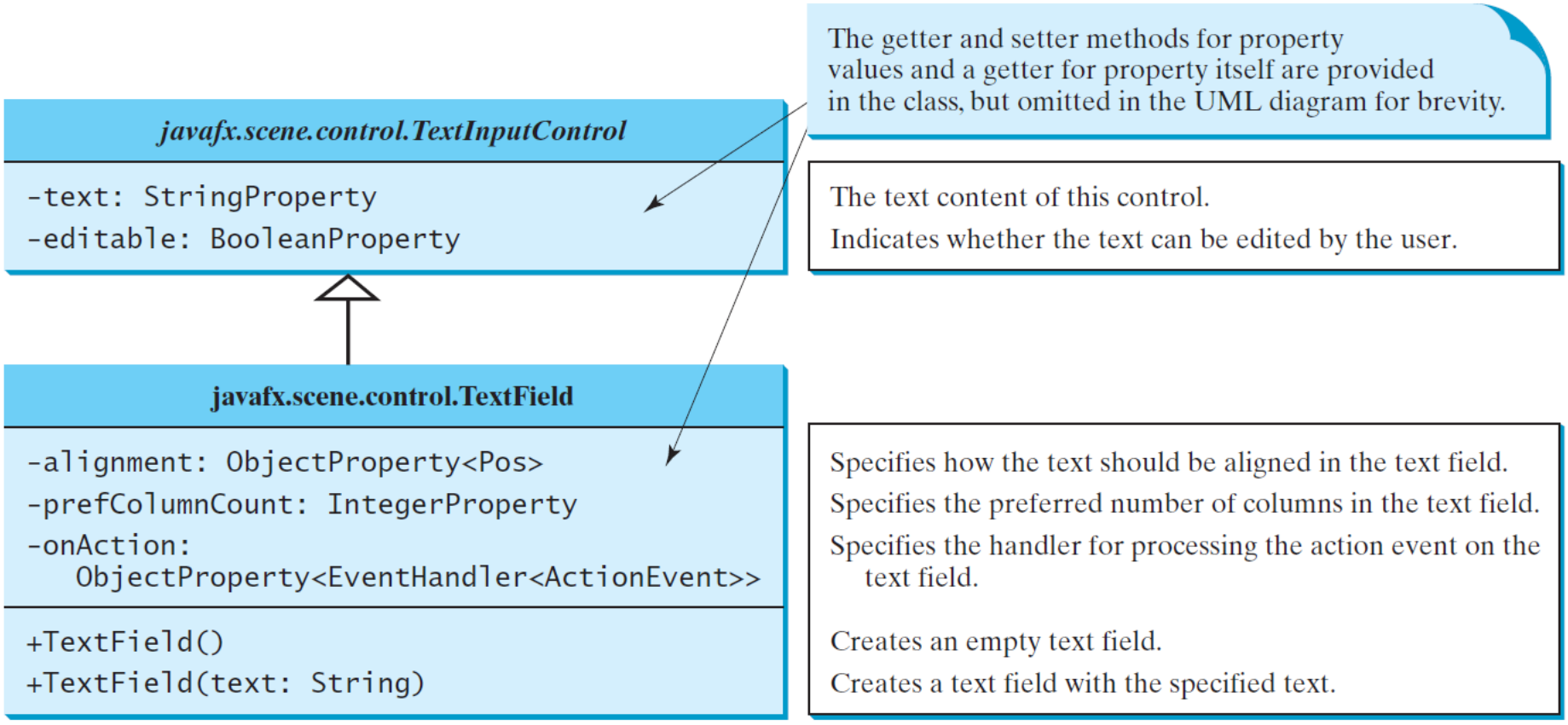
RadioButton Example



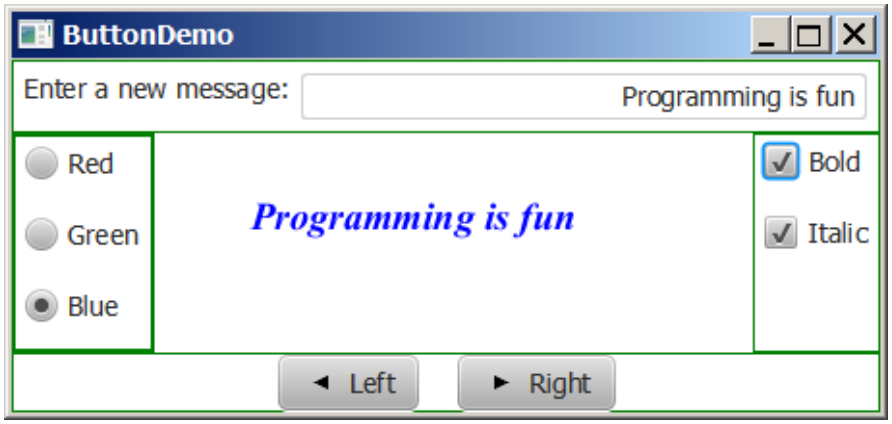
RadioButtonDemo Run

TextField

A text field can be used to enter or display a string. **TextField** is a subclass of **TextInputControl**.



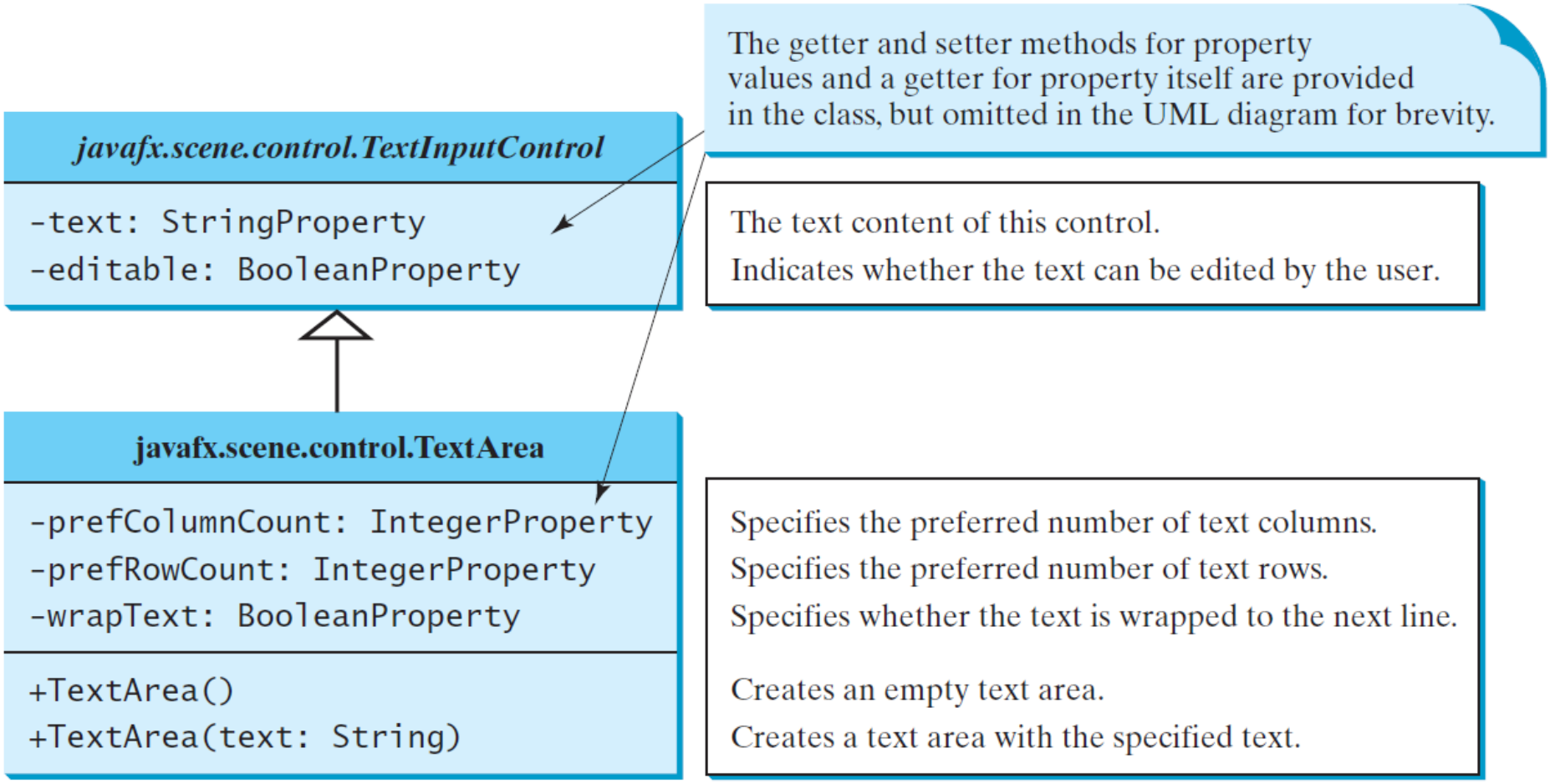
TextField Example



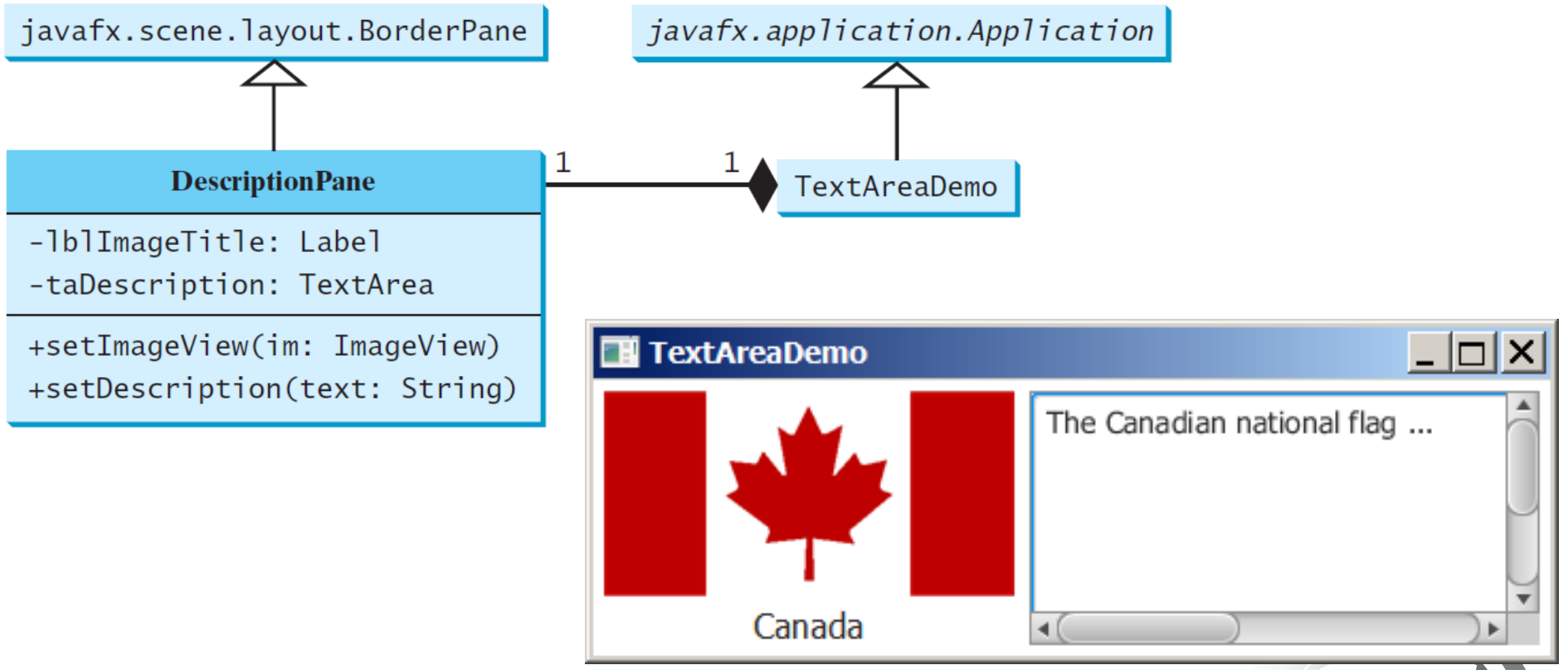
TextFieldDemo Run

TextArea

A **TextArea** enables the user to enter multiple lines of text.



TextArea Example



DescriptionPane TextAreaDemo Run