Chapter 33 - JavaFX UI Controls & Multimedia

(Lia10, C.16)

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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).

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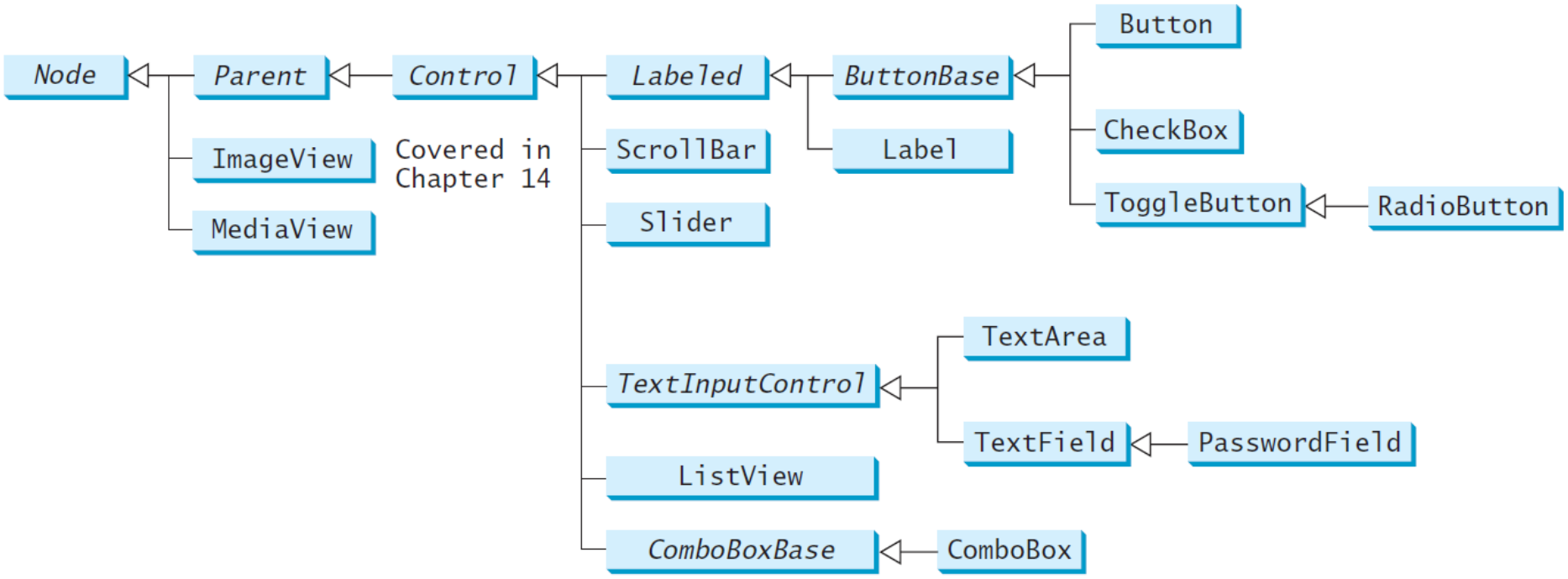
Frequently Used UI Controls



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**.

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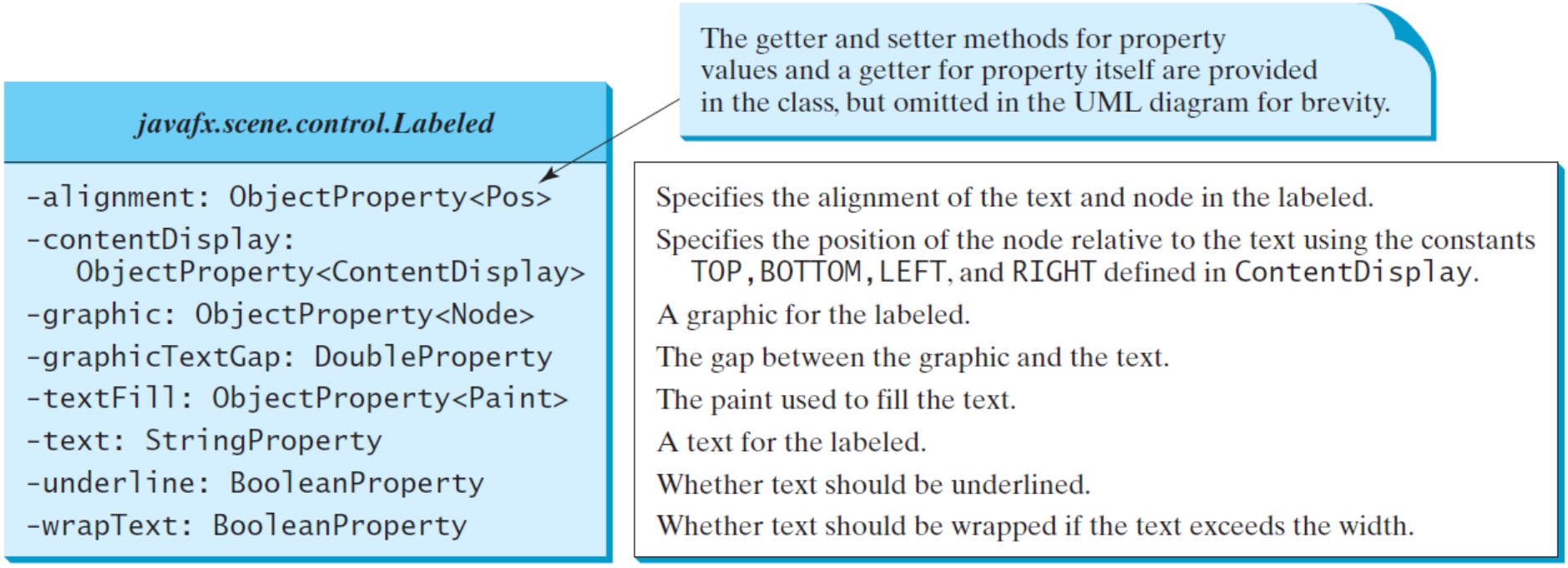
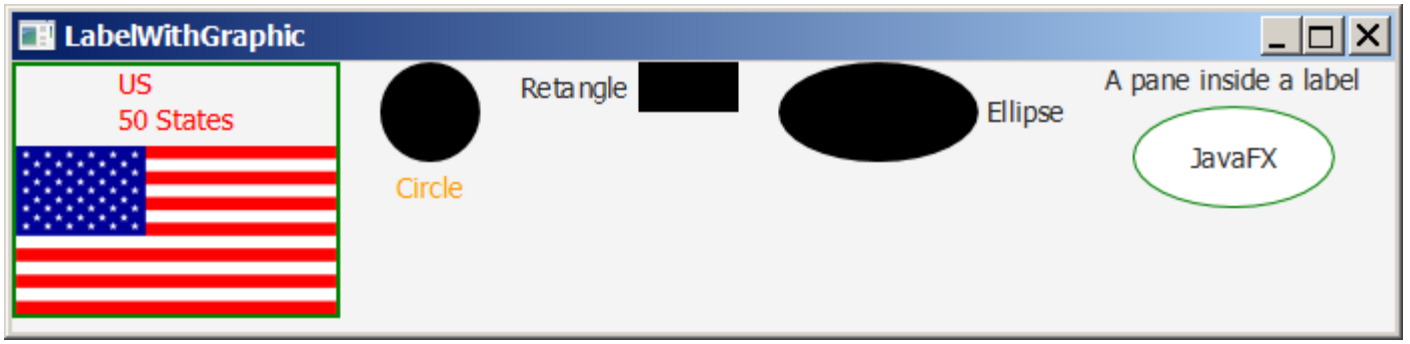
Labeled

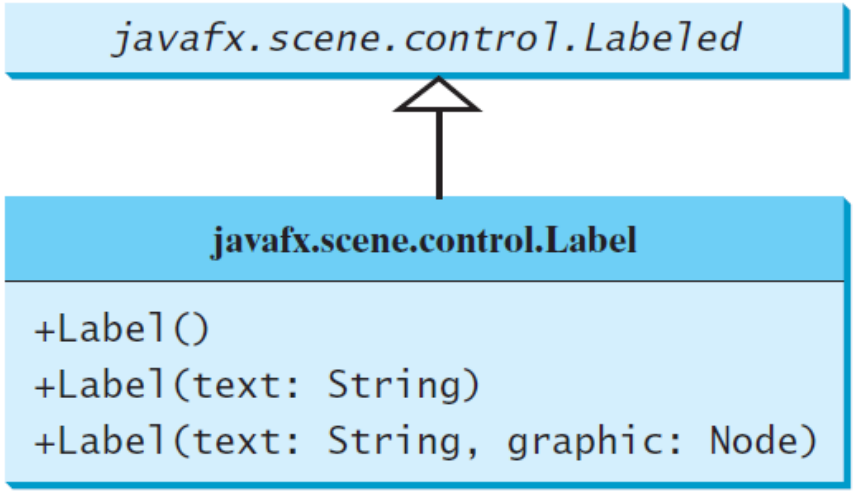
A *label* is a display area for a short text, a node, or both. It is often used to label other controls (usually text fields). Labels and buttons share many common properties. These common properties are defined in the **Labeled** class.



Label

The Label class defines labels.



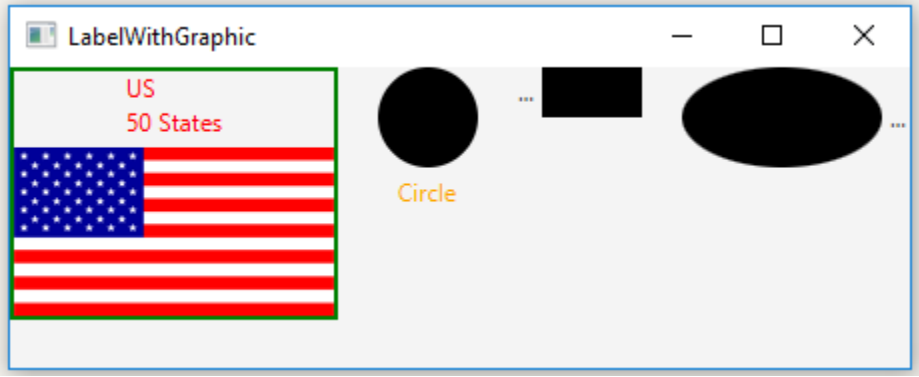


Creates an empty label.

Creates a label with the specified text.

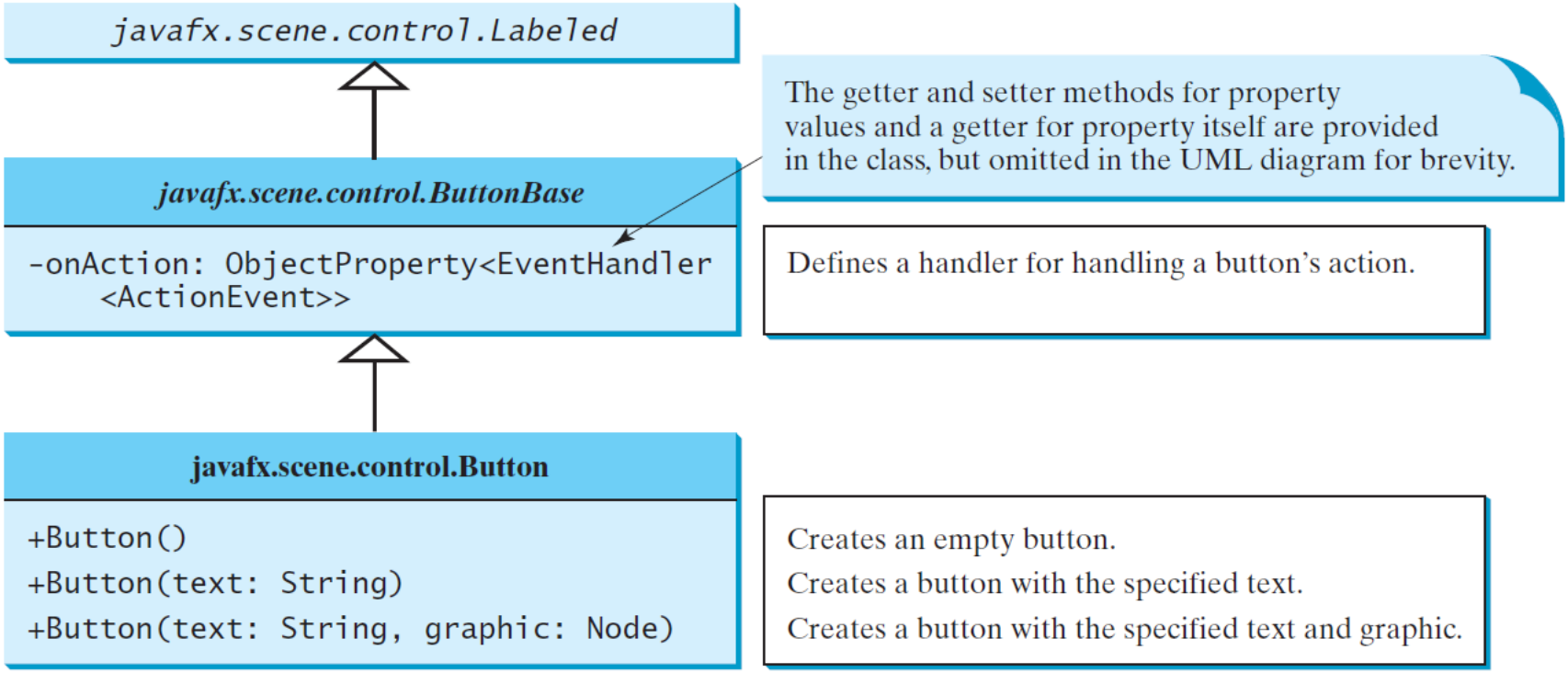
Creates a label with the specified text and graphic.

Example `LabelWithGraphic`

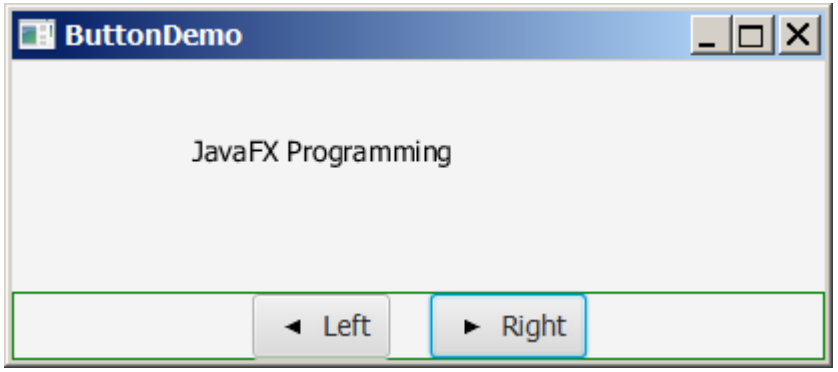


ButtonBase and Button

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.



Example ButtonDemo



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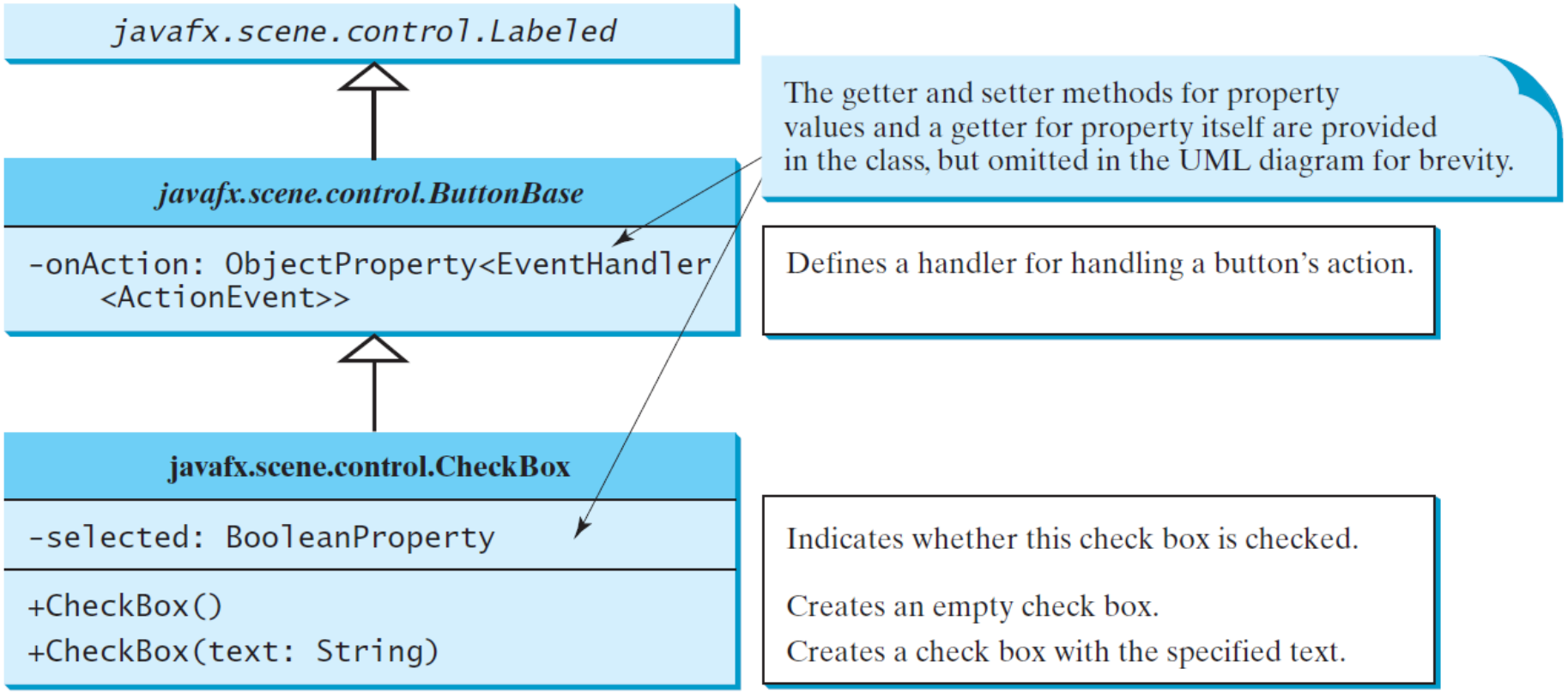
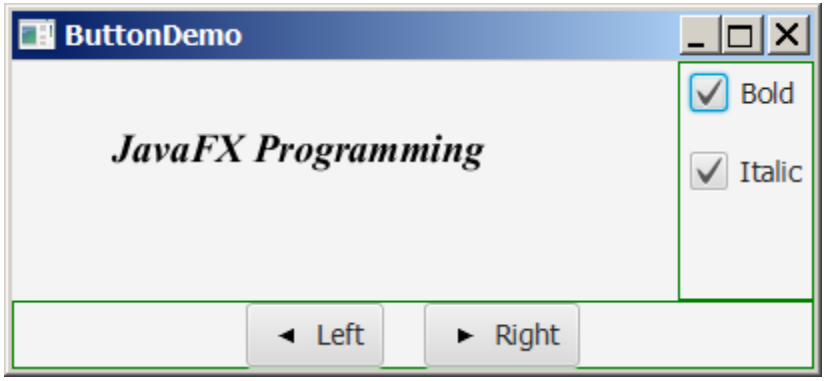
CheckBox

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**.

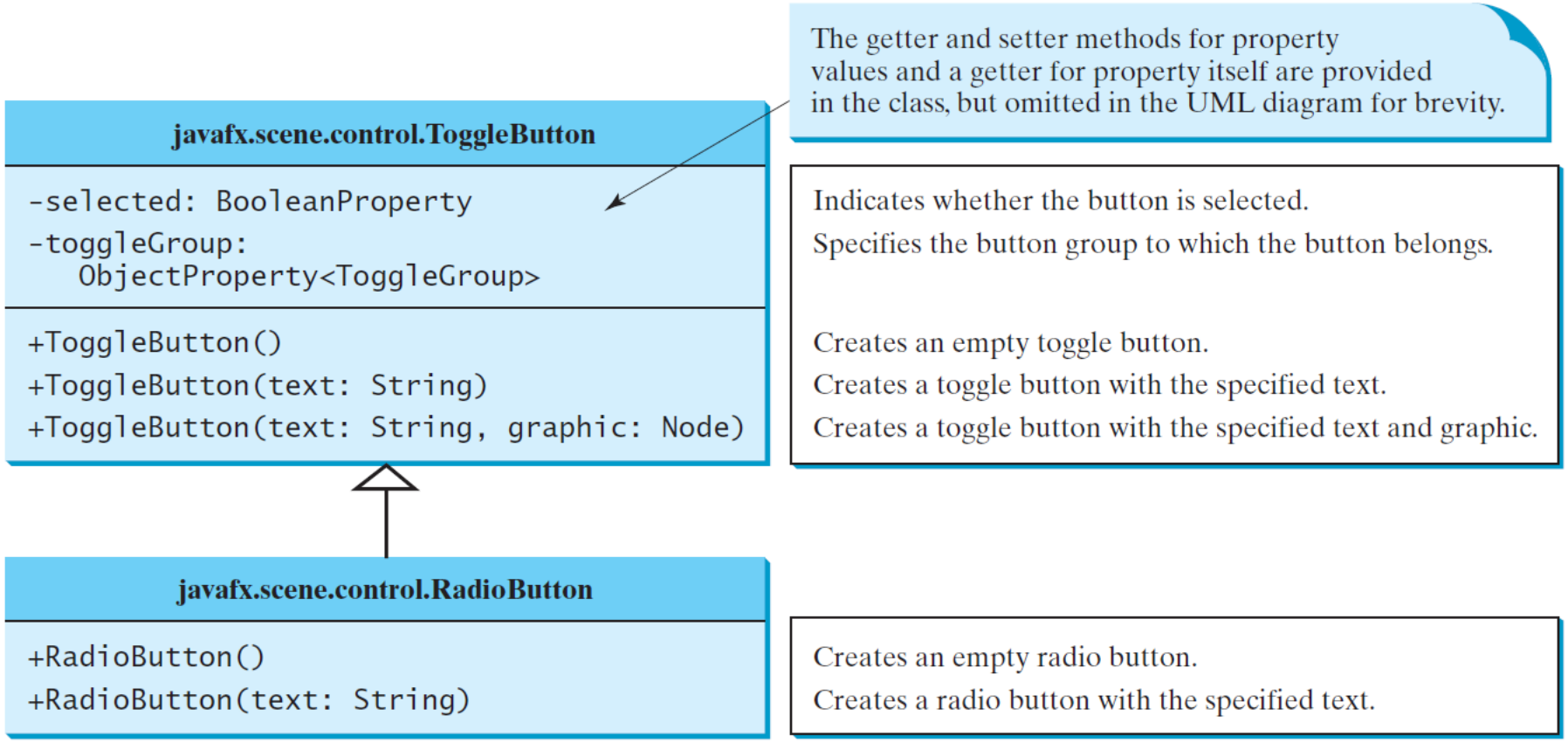


Example CheckBoxDemo



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



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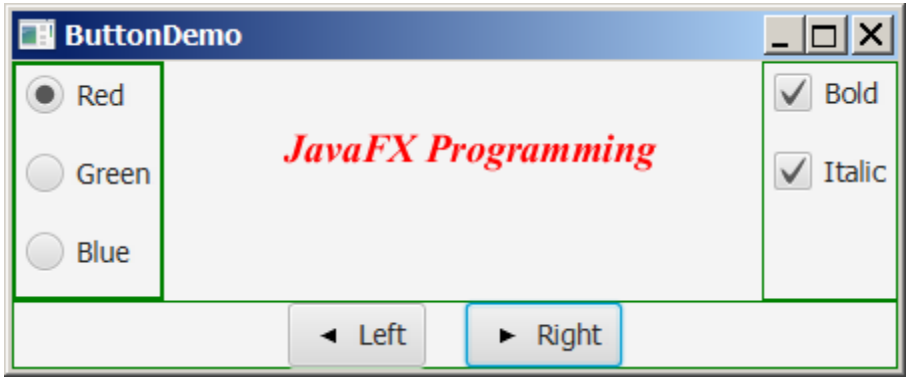
Example RadioButtonDemo



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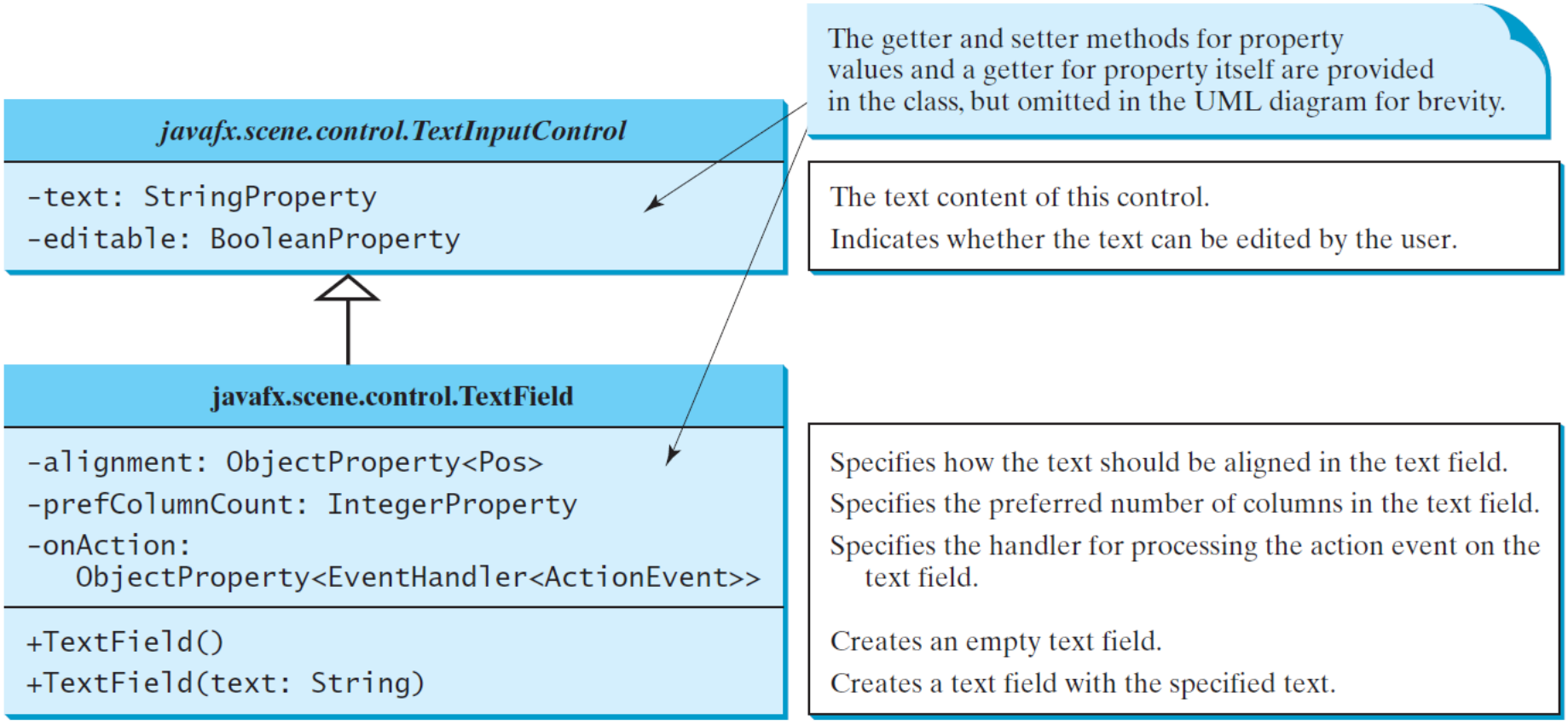
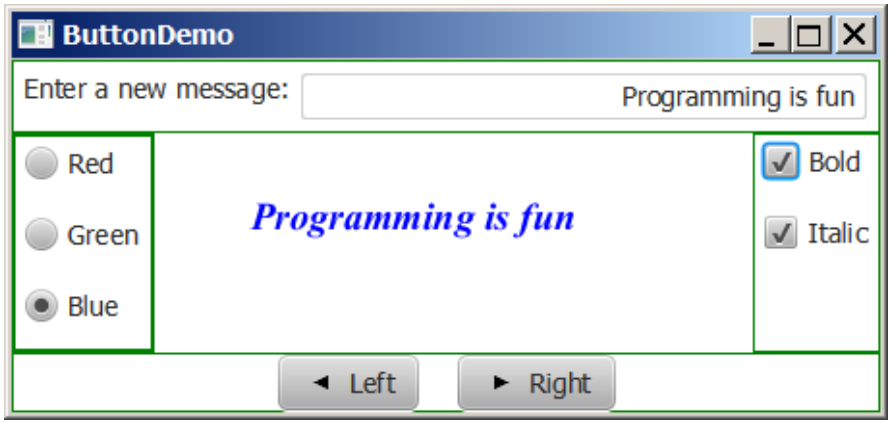
TextField

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



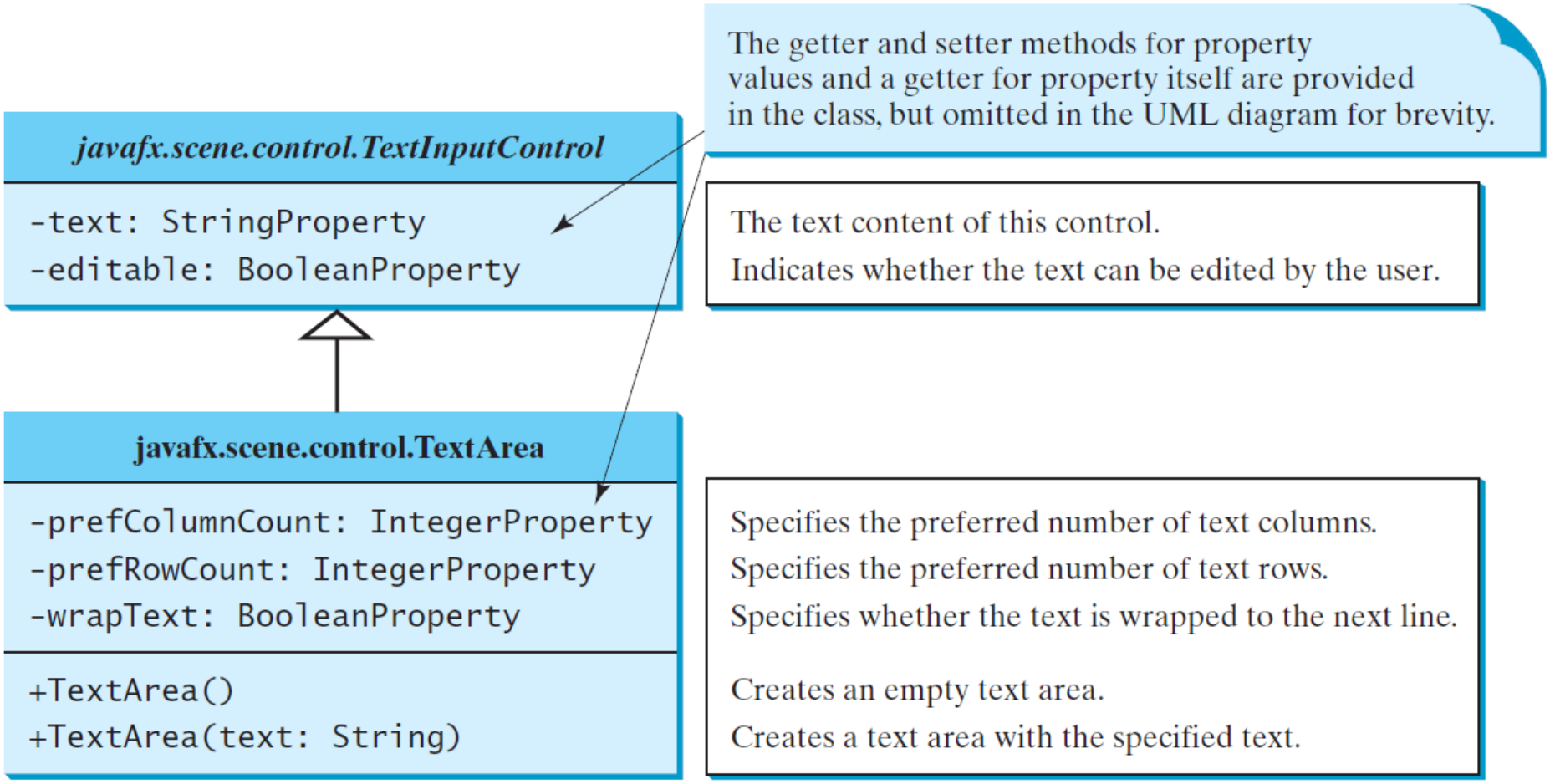
TextField Example

Example `TextFieldDemo`



TextArea

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



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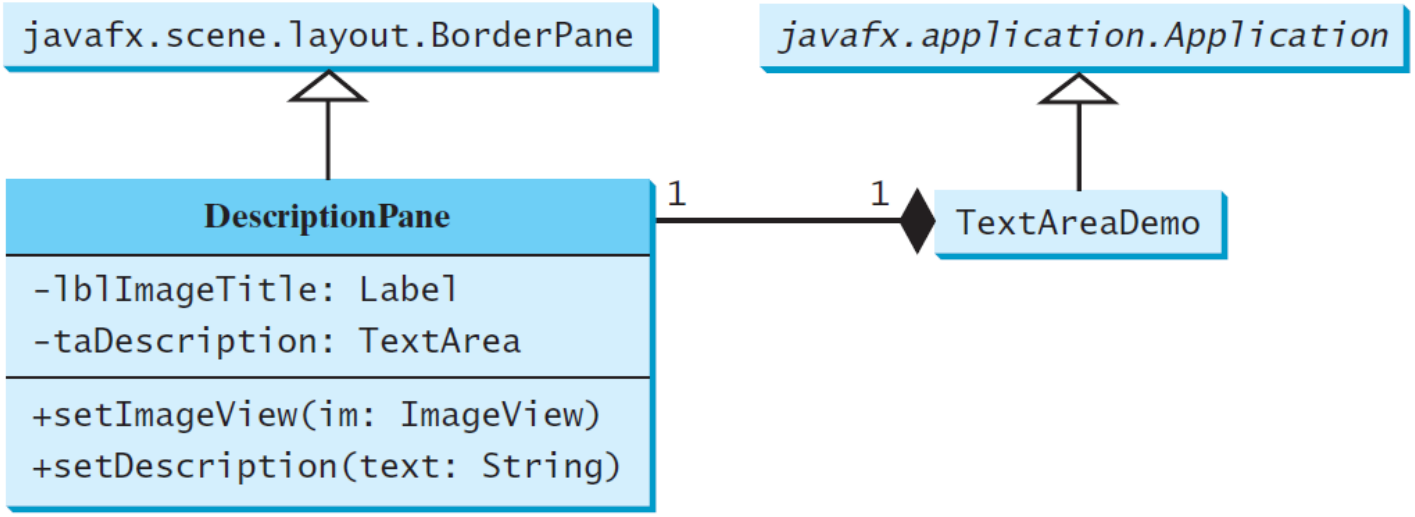
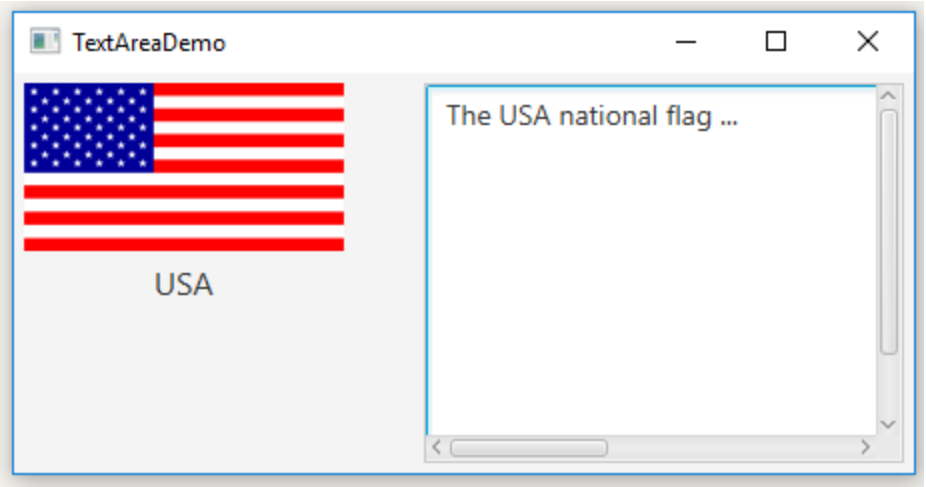
TextArea Example



Example TextAreaDemo



Media

You can use the **Media** class to obtain the source of the media, the **MediaPlayer** class to play and control the media, and the **MediaView** class to display the video.

The getter and setter methods for property values and a getter for property itself are provided in the class, but omitted in the UML diagram for brevity.

javafx.scene.media.Media

```
-duration: ReadOnlyObjectProperty
   <Duration>
-width: ReadOnlyIntegerProperty
-height: ReadOnlyIntegerProperty
+Media(source: String)
```

The durations in seconds of the source media.

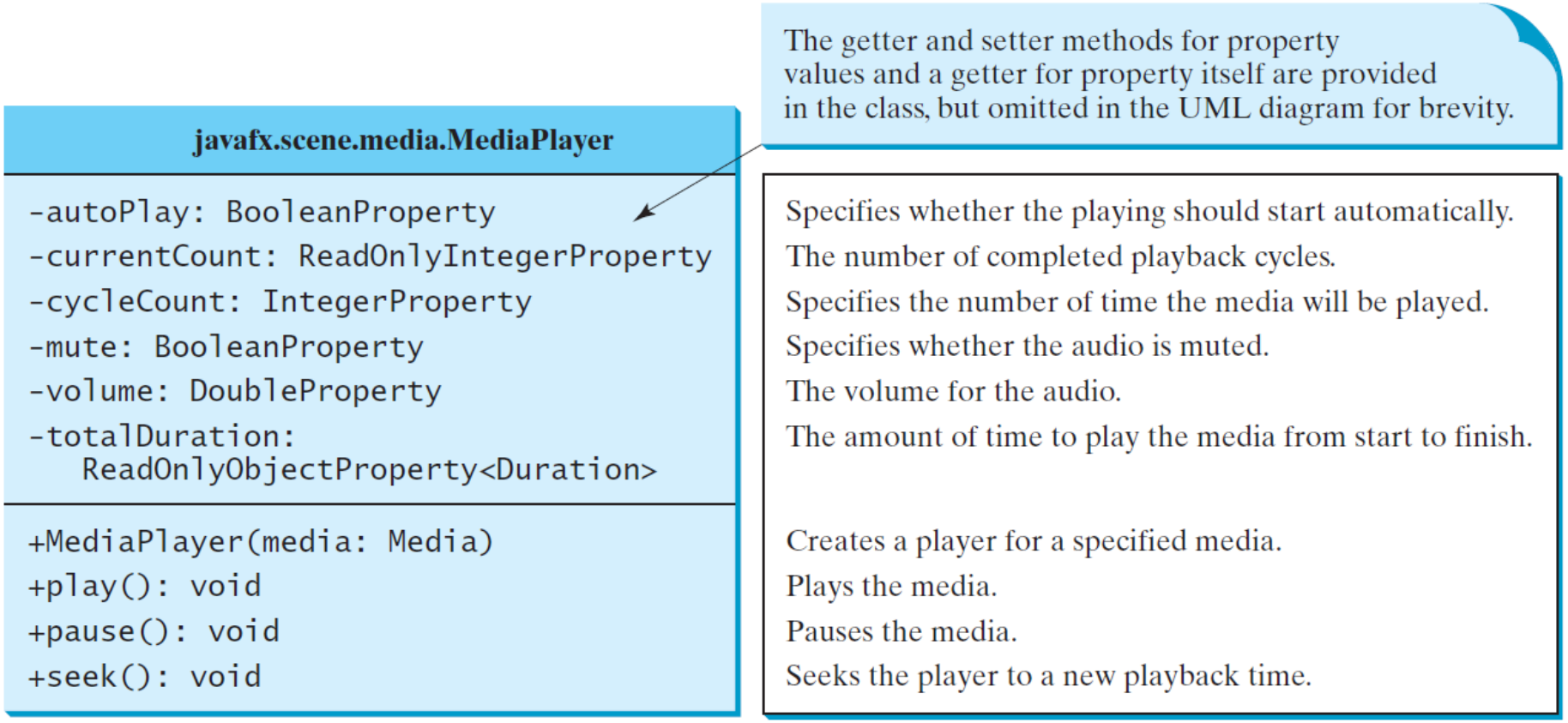
The width in pixels of the source video.

The height in pixels of the source video.

Creates a `Media` from a URL source.

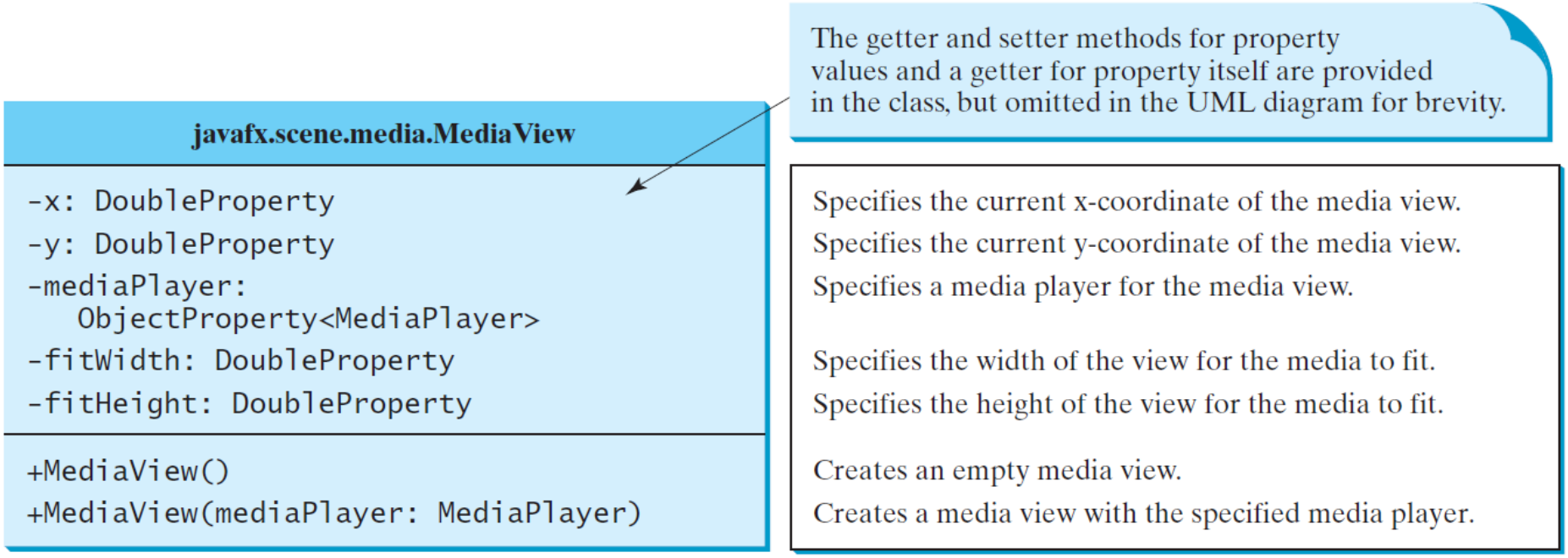
MediaPlayer

The **MediaPlayer** class playes and controls the media with properties such as **autoPlay**, **currentCount**, **cycleCount**, **mute**, **volume**, and **totalDuration**.



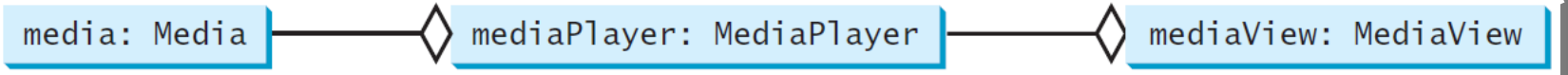
MediaView

The **MediaView** class is a subclass of **Node** that provides a view of the **Media** being played by a **MediaPlayer**. The **MediaView** class provides the properties for viewing the media.



Example: MediaDemo

This example displays a video in a view. You can use the play/pause button to play or pause the video and use the rewind button to restart the video, and use the slider to control the volume of the audio.



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Downloads

- Sample source code:
  - **LabelWithGraphic.java**
  - **ButtonDemo**
  - **CheckBoxDemo.java**
  - **RadioButtonDemo.java**
  - **TextFieldDemo.java**
  - **TextAreaDemo.java, DescriptionPane.java**
  - **MediaDemo.java**
- Image file: have a folder called **image** in your BlueJ project folder, and put the image files in it:
  - **us.gif**
  - **left.gif, right.gif**

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THE END