

Teil XIII

Graphical User Interfaces (GUI) – JavaFX

GUI: JavaFXDemo.java

```
1  package javafxdemo;
2
3  import javafx.application.Application;
4  import javafx.scene.Parent;
5  import javafx.scene.Scene;
6  import javafx.stage.Stage;
7
8  /** @author zeckzer
9   */
10 public class JavaFXDemo
11     extends Application {
```

GUI: JavaFXDemo.java

```
1  package javafxdemo;
2
3  import javafx.application.Application;
4  import javafx.scene.Parent;
5  import javafx.scene.Scene;
6  import javafx.stage.Stage;
7
8  /** @author zeckzer
9   */
10 public class JavaFXDemo
11     extends Application {
12
13     @Override
14     public void start(Stage stage) {
15         JavaFXDemoFrameController
16             javaFXDemoFrameController
17                 = JavaFXDemoFrameController.getInstance();
18
19         Parent
20             root = javaFXDemoFrameController.getRoot();
21
22         Scene scene = new Scene(root);
23
24         stage.setTitle("JavaFXDemo");
25         stage.setScene(scene);
26         stage.show();
27
28         javaFXDemoFrameController.init();
29     }
30
31     public static void main(String[] args) {
32         launch(args);
33     }
34 }
35
36 }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <?import javafx.scene.control.ColorPicker?>
4  <?import javafx.scene.control.Label?>
5  <?import javafx.scene.control.SplitPane?>
6  <?import javafx.scene.control.TextField?>
7  <?import javafx.scene.layout.AnchorPane?>
```



GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <?import javafx.scene.control.ColorPicker?>
4  <?import javafx.scene.control.Label?>
5  <?import javafx.scene.control.SplitPane?>
6  <?import javafx.scene.control.TextField?>
7  <?import javafx.scene.layout.AnchorPane?>
```

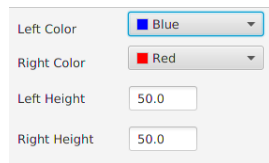


```
1  <SplitPane
2    dividerPositions="0.4"
3    maxHeight="-Infinity" maxWidth="-Infinity"
4    minHeight="-Infinity" minWidth="-Infinity"
5    prefHeight="572.0" prefWidth="814.0"
6    xmlns="http://javafx.com/javafx/8.0.131"
7    xmlns:fx="http://javafx.com/fxml/1"
8    fx:controller=
9      "javafxdemo.JavaFXDemoFrameController">
10  <items>
11    <AnchorPane
12      minHeight="0.0" minWidth="0.0"
13      prefHeight="570.0" prefWidth="197.0">
14      <children>
15
16        ...
17
18      </children>
19    </AnchorPane>
20    <AnchorPane
21      minHeight="0.0" minWidth="0.0"
22      prefHeight="160.0" prefWidth="150.0"
23    />
24  </items>
25 </SplitPane>
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1      <Label layoutX="9.0" layoutY="14.0"
2          text="Left Color" />
3      <ColorPicker fx:id="cpLeftColor"
4          layoutX="127.0" layoutY="4.0"
5          onAction="#leftColorChanged" />
6      <Label layoutX="9.0" layoutY="50.0"
7          text="Right Color" />
8      <ColorPicker fx:id="cpRightColor"
9          layoutX="127.0" layoutY="40.0"
10         onAction="#rightColorChanged" />
11     <Label layoutX="9.0" layoutY="88.0" text="Left Height" />
12     <TextField fx:id="tfLeftHeight"
13         layoutX="128.0" layoutY="83.0"
14         onAction="#leftHeightChanged"
15         prefHeight="26.0" prefWidth="73.0" />
16     <Label layoutX="9.0" layoutY="131.0" text="Right Height" />
17     <TextField fx:id="tfRightHeight"
18         layoutX="128.0" layoutY="126.0"
19         onAction="#rightHeightChanged"
20         prefHeight="26.0" prefWidth="73.0" />
```



GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1  <SplitPane
2      dividerPositions="0.4"
3      maxHeight="-Infinity" maxWidth="-Infinity"
4      minHeight="-Infinity" minWidth="-Infinity"
5      prefHeight="572.0" prefWidth="814.0"
6      xmlns="http://javafx.com/javafx/8.0.131"
7      xmlns:fx="http://javafx.com/fxml/1"
8      fx:controller=
9          "javafxdemo.JavaFXDemoFrameController">
10  <items>
11      <AnchorPane
12          minHeight="0.0" minWidth="0.0"
13          prefHeight="570.0" prefWidth="197.0">
14          <children>
15              ...
16          </children>
17      </AnchorPane>
18      <AnchorPane
19          minHeight="0.0" minWidth="0.0"
20          prefHeight="160.0" prefWidth="150.0"
21      />
22  </items>
23  </SplitPane>
```

JavaFXDemoFrameController.java

```
1  package javafxdemo;
2
3  import java.io.IOException;
4  import java.net.URL;
5  import java.util.ResourceBundle;
6  import javafx.event.ActionEvent;
7  import javafx.fxml.FXML;
8  import javafx.fxml.FXMLLoader;
9  import javafx.fxml.Initializable;
10 import javafx.scene.Parent;
11 import javafx.scene.control.ColorPicker;
12 import javafx.scene.control.SplitPane;
13 import javafx.scene.control.TextField;
14 import javafx.scene.paint.Color;
15
16 public class JavaFXDemoFrameController
17     implements Initializable {
18     ...
19 }
20
21 }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1    <ColorPicker
2        fx:id="cpLeftColor"
3        layoutX="127.0" layoutY="4.0"
4        onAction="#leftColorChanged"
5    />
6    <ColorPicker
7        fx:id="cpRightColor"
8        layoutX="127.0" layoutY="40.0"
9        onAction="#rightColorChanged"
10   />
11   <TextField
12       fx:id="tfLeftHeight"
13       layoutX="128.0" layoutY="83.0"
14       onAction="#leftHeightChanged"
15       prefHeight="26.0" prefWidth="73.0"
16   />
17   <TextField
18       fx:id="tfRightHeight"
19       layoutX="128.0" layoutY="126.0"
20       onAction="#rightHeightChanged"
21       prefHeight="26.0" prefWidth="73.0"
22   />
```

JavaFXDemoFrameController.java

```
1    @FXML
2    private ColorPicker cpLeftColor;
3    @FXML
4    private ColorPicker cpRightColor;
5    @FXML
6    private TextField tfLeftHeight;
7    @FXML
8    private TextField tfRightHeight;
9
10   JavaFXDemoPaneController
       javaFXDemoPaneController;
```


GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1  <ColorPicker
2    fx:id="cpLeftColor"
3    layoutX="127.0" layoutY="4.0"
4    onAction="#leftColorChanged"
5  />
6  <ColorPicker
7    fx:id="cpRightColor"
8    layoutX="127.0" layoutY="40.0"
9    onAction="#rightColorChanged"
10 />
11 <TextField
12   fx:id="tfLeftHeight"
13   layoutX="128.0" layoutY="83.0"
14   onAction="#leftHeightChanged"
15   prefHeight="26.0" prefWidth="73.0"
16 />
17 <TextField
18   fx:id="tfRightHeight"
19   layoutX="128.0" layoutY="126.0"
20   onAction="#rightHeightChanged"
21   prefHeight="26.0" prefWidth="73.0"
22 />
```

JavaFXDemoFrameController.java

```
1  public void init() {
2    // Erzeuge controller fuer rechte Pane
3    javaFXDemoPaneController =
4      JavaFXDemoPaneController.getInstance();
5
6    // Setze rechte Pane der SplitPane
7    rootPane.getItems().set(1,
8      javaFXDemoPaneController.getRoot());
9
10   // Initialisiere GUI Elemente der linken
11   Seite
12   cpLeftColor.setValue(
13     javaFXDemoPaneController.getLeftColor());
14   cpRightColor.setValue(
15     javaFXDemoPaneController.getRightColor());
16   ;
17   tfLeftHeight.setText(
18     Double.toString(javaFXDemoPaneController
19       .getLeftHeight()));
19   tfRightHeight.setText(
20     Double.toString(javaFXDemoPaneController
21       .getRightHeight()));
22
23   // Zeichne rechte Seite
24   javaFXDemoPaneController.draw();
25 }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1 <ColorPicker
2   fx:id="cpLeftColor"
3   layoutX="127.0" layoutY="4.0"
4   onAction="#leftColorChanged"
5 />
6 <ColorPicker
7   fx:id="cpRightColor"
8   layoutX="127.0" layoutY="40.0"
9   onAction="#rightColorChanged"
10 />
```



JavaFXDemoFrameController.java

```
1 @FXML
2 private void leftColorChanged(
3  (ActionEvent) event
4 ) {
5   Color color = cpLeftColor.getValue();
6   javaFXDemoPaneController.setLeftColor(
7     color);
8 }
9 @FXML
10 private void rightColorChanged(
11  (ActionEvent) event
12 ) {
13   Color color = cpRightColor.getValue();
14   javaFXDemoPaneController.setRightColor(
15     color);
16 }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1 <TextField
2   fx:id="tfLeftHeight"
3   layoutX="128.0" layoutY="83.0"
4   onAction="#leftHeightChanged"
5   prefHeight="26.0" prefWidth="73.0"
6 />
7 <TextField
8   fx:id="tfRightHeight"
9   layoutX="128.0" layoutY="126.0"
10  onAction="#rightHeightChanged"
11  prefHeight="26.0" prefWidth="73.0"
12 />
```



JavaFXDemoFrameController.java

```
1 @FXML
2 private void leftHeightChanged(
3    (ActionEvent) event
4 ) {
5     double leftHeight = Double.parseDouble(
6         tfLeftHeight.getText());
7     javaFXDemoPaneController.setLeftHeight(
8         leftHeight);
9 }
10 @FXML
11 private void rightHeightChanged(
12    (ActionEvent) event
13 ) {
14     double rightHeight = Double.parseDouble(
15         tfRightHeight.getText());
16     javaFXDemoPaneController.setRightHeight(
17         rightHeight);
18 }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrame.fxml

```
1  <SplitPane
2    dividerPositions="0.4"
3    maxHeight="-Infinity" maxWidth="-Infinity"
4    minHeight="-Infinity" minWidth="-Infinity"
5    prefHeight="572.0" prefWidth="814.0"
6    xmlns="http://javafx.com/javafx/8.0.131"
7    xmlns:fx="http://javafx.com/fxml/1"
8    fx:controller=
9      "javafxdemo.JavaFXDemoFrameController"
10 >
11
12 ...
13
14 </SplitPane>
```

JavaFXDemoFrameController.java

```
1  SplitPane rootPane;
2
3  public void setPane(SplitPane rootPane) {
4      this.rootPane = rootPane;
5  }
6
7  public Parent getRoot() {
8      return rootPane;
9  }
```

GUI: JavaFXDemoFrame

JavaFXDemoFrameController.java

```
1  public static JavaFXDemoFrameController getInstance() {
2
3      FXMLLoader loader = new FXMLLoader();
4
5      try {
6          // Load root layout from fxml file.
7          loader.setLocation(
8              JavaFXDemoFrameController.class.getResource("JavaFXDemoFrame.fxml")
9          );
10
11         SplitPane rootPane = (SplitPane) loader.load();
12
13         JavaFXDemoFrameController
14             javaFXDemoFrameController = loader.<JavaFXDemoFrameController>getController();
15         javaFXDemoFrameController.setPane(rootPane);
16         return javaFXDemoFrameController;
17     } catch (IOException e) {
18         e.printStackTrace();
19         return null;
20     }
21 }
```

GUI: JavaFXDemoPane

JavaFXDemoPane.fxml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <?import java.lang.*?>
4  <?import java.util.*?>
5  <?import javafx.scene.*?>
6  <?import javafx.scene.control.*?>
7  <?import javafx.scene.layout.*?>
8
9  <AnchorPane
10     id="AnchorPane"
11     prefHeight="800" prefWidth="800"
12     xmlns:fx="http://javafx.com/fxml/1"
13     fx:controller="javafxdemo.
        JavaFXDemoPaneController">
14  </AnchorPane>
```

GUI: JavaFXDemoPane

JavaFXDemoPane.fxml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <?import java.lang.*?>
4  <?import java.util.*?>
5  <?import javafx.scene.*?>
6  <?import javafx.scene.control.*?>
7  <?import javafx.scene.layout.*?>
8
9  <AnchorPane
10     id="AnchorPane"
11     prefHeight="800" prefWidth="800"
12     xmlns:fx="http://javafx.com/fxml/1"
13     fx:controller="javafxdemo.
        JavaFXDemoPaneController">
14  </AnchorPane>
```

JavaFXDemoPaneController.java

```
1  package javafxdemo;
2
3  import java.io.IOException;
4  import java.net.URL;
5  import java.util.ResourceBundle;
6  import javafx.fxml.FXML;
7  import javafx.fxml.FXMLLoader;
8  import javafx.fxml.Initializable;
9  import javafx.scene.Parent;
10 import javafx.scene.layout.AnchorPane;
11 import javafx.scene.paint.Color;
12 import javafx.scene.shape.Rectangle;
13
14 public class JavaFXDemoPaneController
15     implements Initializable {
16
17     ...
18
19 }
```

GUI: JavaFXDemoPane

JavaFXDemoPane.fxml

```
1  <?xml version="1.0" encoding="UTF-8"?>
2
3  <?import java.lang.*?>
4  <?import java.util.*?>
5  <?import javafx.scene.*?>
6  <?import javafx.scene.control.*?>
7  <?import javafx.scene.layout.*?>
8
9  <AnchorPane
10     id="AnchorPane"
11     prefHeight="800" prefWidth="800"
12     xmlns:fx="http://javafx.com/fxml/1"
13     fx:controller="javafxdemo.
        JavaFXDemoPaneController">
14  </AnchorPane>
```

JavaFXDemoPaneController.java

```
1  @FXML
2  private AnchorPane rootPane;
3
4  public void setPane(
5      AnchorPane rootPane
6  ) {
7      this.rootPane = rootPane;
8  }
9
10 public Parent getRoot() {
11     return rootPane;
12 }
```


GUI: JavaFXDemoPane

JavaFXDemoPaneController.java

```
1  public static JavaFXDemoPaneController getInstance() {
2
3      FXMLLoader loader = new FXMLLoader();
4
5      try {
6          // Load root layout from fxml file.
7          loader.setLocation(
8              JavaFXDemoPaneController.class.getResource("JavaFXDemoPane.fxml")
9          );
10
11         AnchorPane rootPane = (AnchorPane) loader.load();
12
13         JavaFXDemoPaneController
14             javaFXDemoPaneController = loader.<JavaFXDemoPaneController>getController();
15         javaFXDemoPaneController.setPane(rootPane);
16         return javaFXDemoPaneController;
17     } catch (IOException e) {
18         e.printStackTrace();
19         return null;
20     }
21 }
```

GUI: JavaFXDemoPane

JavaFXDemoPaneController.java

```
1     private Color leftColor = Color.BLUE;
2     private Color rightColor = Color.RED;
3
4     public Color getLeftColor() {
5         return leftColor;
6     }
7
8     public void setLeftColor(
9         Color leftColor
10    ) {
11        this.leftColor = leftColor;
12        this.draw();
13    }
14
15    public Color getRightColor() {
16        return rightColor;
17    }
18
19    public void setRightColor(
20        Color rightColor
21    ) {
22        this.rightColor = rightColor;
23        this.draw();
24    }
```

GUI: JavaFXDemoPane

JavaFXDemoPaneController.java

```
1     private Color leftColor = Color.BLUE;
2     private Color rightColor = Color.RED;
3
4     public Color getLeftColor() {
5         return leftColor;
6     }
7
8     public void setLeftColor(
9         Color leftColor
10    ) {
11        this.leftColor = leftColor;
12        this.draw();
13    }
14
15    public Color getRightColor() {
16        return rightColor;
17    }
18
19    public void setRightColor(
20        Color rightColor
21    ) {
22        this.rightColor = rightColor;
23        this.draw();
24    }
```

JavaFXDemoPaneController.java

```
1     private double leftHeight = 50.0;
2     private double rightHeight = 50.0;
3
4     public double getLeftHeight() {
5         return leftHeight;
6     }
7
8     public void setLeftHeight(
9         double leftHeight
10    ) {
11        this.leftHeight = leftHeight;
12        this.draw();
13    }
14
15    public double getRightHeight() {
16        return rightHeight;
17    }
18
19    public void setRightHeight(
20        double rightHeight
21    ) {
22        this.rightHeight = rightHeight;
23        this.draw();
24    }
```

GUI: JavaFXDemoPane

JavaFXDemoPaneController.java

```
1      @Override
2      public void initialize(URL url, ResourceBundle rb) {
3          // TODO
4      }
5
6      public void draw() {
7          rootPane.getChildren().clear();
8
9          double x = 200.0;
10         double y = 50.0;
11         double width = 100.0;
12
13         Rectangle leftRectangle = createRectangle(x - 1.2 * width, y,
14                                                    width, leftHeight,
15                                                    leftColor);
16         rootPane.getChildren().add(leftRectangle);
17
18         Rectangle rightRectangle = createRectangle(x + 1.2 * width, y,
19                                                    width, rightHeight,
20                                                    rightColor);
21         rootPane.getChildren().add(rightRectangle);
22     }
```

GUI: JavaFXDemoPane

JavaFXDemoPaneController.java

```
1     private Rectangle createRectangle(  
2         double x,  
3         double y,  
4         double width,  
5         double height,  
6         Color color  
7     ) {  
8         Rectangle rectangle = new Rectangle(x, y, width, height);  
9         rectangle.setFill(color);  
10        rectangle.setStroke(Color.BLACK);  
11        return rectangle;  
12    }
```