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Chapter 15 Check Point Questions

Section 15.2

▼15.2.1

What is an event source object? What is an event object? Describe the relationship between an event source object and an event object.

The event source object, also called source object, is the source where an event is fired. An event object contains the information about the event. The relationship between a source object and an event is that the event is an object created by the source.

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▼15.2.2

Can a button fire a MouseEvent? Can a button fire a KeyEvent? Can a button fire an ActionEvent?

Button is a subclass of Node, therefore, it can fire MouseEvent, KeyEvent, as well as ActionEvent.

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Section 15.3

▼15.3.1

Why must a handler be an instance of an appropriate handler interface?

A handler must have a correct method to handle the event. To ensure that a handler have the method, a handler must be an instance of a handler interface, where a method is defined.

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▼15.3.2

Explain how to register a handler object and how to implement a handler interface.

To register a handler object, you invoke the source object's registration method; for example, button.setOnAction (handler) for registering a handler for a button action event. To implement a handler interface, you implement the method defined in the handler interface.

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▼15.3.3

What is the handler method for the EventHandler<ActionEvent> interface?

The handler method for the EvnetHandler<T extends Event> interface is

```
public void handle(T)
```

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▼15.3.4

What is the registration method for a button to register an ActionEvent handler?

The method for a button to register an ActionEvent is

```
button.setOnAction(handler)
```

Hide Answer Read Answer

Section 15.4

▼15.4.1

Can an inner class be used in a class other than the class in which it nests?

Yes

Hide Answer Read Answer

▼15.4.2

Can the modifiers public, protected, private, and static be used for inner classes?

Yes

Hide Answer Read Answer

Section 15.5

▼15.5.1

If class A is an inner class in class B, what is the .class file for A? If class B contains two anonymous inner classes, what are the .class file names for these two classes?

If class A is an inner class in class B, the .class file for A is B$A.class. If class B contains two anonymous inner classes, the .class file names for these two classes are B$+1 and B$+2.

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▼15.5.2

What is wrong in the following code?

```
(a)
public class Test extends Application {
  public void start(Stage stage) {
    Button btOK = new Button("OK");
  }

  private class Handler implements
      EventHandler<ActionEvent> {
    public void handle(Action e) {
      System.out.println(e.getSource());
    }
  }
}

(b)
```

```
public class Test extends Application {
  public void start(Stage stage) {
    Button btOK = new Button("OK");

    btOK.setOnAction(
    new EventHandler<ActionEvent> {
      public void handle(ActionEvent e) {
        System.out.println(e.getSource());
      }
    }  // Something missing here
  }
}
```

(a) There is no registration for the handler.
(b) 1. missing); in Line -2 ; 2. Missing () after EventHandler<ActionEvent>()

Hide Answer Read Answer

Section 15.6

▼15.6.1

What is a lambda expression? What is the benefit of using lambda expressions for event handling? What is the syntax of a lambda expression?

Lambda expressions can be viewed as an anonymous class with a concise syntax. Using lambda expressions can make code concise and easy to read. The syntax for lambda expressions is:

```
(type1 para1, …, typen paramn) -> expression;
(type1 para1, …, typen paramn) -> {statements};
() -> expression;  or
() -> {statements};
```

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▼15.6.2

What is a functional interface? Why is a functional interface required for a lambda expression?

A functional interface is the interface with exactly one method. A lambda expression works only with a functional interface. For the compiler to understand lambda expressions, the interface must contain exactly one abstract method.

Hide Answer Read Answer

▼15.6.3

Replace the code in lines 5 and 6 in TestLambda.java using anonymous inner classes.

```
test.setAction2(new T2() {
    @Override
    public void m2(Double d) {
      System.out.print(d + "");
    }
});

System.out.println(test.getValue(new T3() {
    @Override
```

```
        public int m3(int e1, int e2) {
          return e1 + e2;
        }
    }));
```

Hide Answer Read Answer

Section 15.8

▼15.8.1

What method do you use to get the mouse-point position for a mouse event?

e.getX() and e.getY()

Hide Answer Read Answer

▼15.8.2

What methods do you use to register a handler for a mouse pressed, released, clicked, entered, exited, moved and dragged event?

```
setOnMouseClicked(handler)
setOnMousePressed(handler)
setOnMouseReleased(handler)
setOnMouseEntered(handler)
setOnMouseExited(handler)
setOnMouseDragged(handler)
setOnMouseMoved(handler)
```

Hide Answer Read Answer

Section 15.9

▼15.9.1

What methods do you use to register handlers for key pressed, key released, and key typed events? In which classes are these methods defined? (See Table 15.1)

```
setOnKeyPressed(handler)
setOnKeyReleased(handler)
setOnKeyTyped(handler)
```

These methods are defined in the Node and Scene classes.

Hide Answer Read Answer

▼15.9.2

What method do you use to get the key character for a key-typed event? What method do you use to get the key code for a key-pressed or key-released event?

For a key-typed event, use e.getCharacter(). For a key-pressed and key-released event, use e.getText().

Hide Answer Read Answer

▼15.9.3

How do you set focus on a node so it can listen for key events?

Use node.requestFocus();

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▼15.9.4

If the following code is inserted in line 57 in Listing 15.9, what is the output if the user presses the key for letter A? What is the output if the user presses the UP arrow key?

```
circlePane.setOnKeyPressed(e ->
  System.out.println("Key pressed " + e.getCode()));
circlePane.setOnKeyTyped(e ->
  System.out.println("Key typeed " + e.getCode()));
```

If the user presses the key for A, the output is
Key pressed A
Key typeed UNDEFINED
If the user presses the key for the UP arrow key, the output is
Key pressed UP

Hide Answer Read Answer

Section 15.10

▼15.10.1

What would happen if you replace pane with scene or primaryStage in lines 31-32?

It will work with the scene, because the scene and pane have the same size in this case. When the scene size changes, the pane size changes accordingly. It does not work with a stage, because change the dimension on the stage does not change the height of the scene and pane in this case.

Hide Answer Read Answer

Section 15.11

▼15.11.1

How do you set the cycle count of an animation to infinite? How do you auto reverse an animation? How do you start, pause, and stop an animation?

```
animation.setCycleCount(Timeline.INFINITY);
animation.setAutoReverse(true);
animation.start();
animation.pause();
animation.stop();
```

Hide Answer Read Answer

▼15.11.2

Are PathTransition, FadeTransition, and Timeline a subtype of Animation?

Yes

Hide Answer Read Answer

▼15.11.3

How do you create a PathTransition? How do you create a FadeTransition? How do you create a Timeline?

See the UML diagrams for PathTransition and FadeTransition. To create a Timeline, place KeyFrame objects into it.

Hide Answer Read Answer

▼15.11.4

How do you create a KeyFrame?

To create a KeyFrame, use new KeyFrame(Duration, handler).

Hide Answer Read Answer

Section 15.12

▼15.12.1

How does the program make the ball moving?

The program makes the ball moving by redisplaying it in a new location every 50 milliseconds.

Hide Answer Read Answer

▼15.12.2

How does the code in Listing 15.17 BallPane.java change the direction of the ball movement?

The direction is changed by changing the sign for dx and dy.

Hide Answer Read Answer

▼15.12.3

What does the program do when the mouse is pressed on the ball pane? What does the program do when the mouse is released on the ball pane?

The programs pauses the animation when a mouse is pressed in the pane and starts the animation when the mouse is released.

Hide Answer Read Answer

▼15.12.4

If line 32 in Listing 15.18 BounceBall.java is not in the program, what would happen when you press the UP or the DOWN arrow key?

If line 32 is not in the program, the pane will not get focused to receive key events. When you press keys, the key handlers are not called.

Hide Answer Read Answer

▼15.12.5

If line 23 is not in Listing 15.17, what would happen?

In line 23 is not in BallPane.java, the animation repeats only once. So you will see the ball movement stopped.

Hide Answer Read Answer

Section 15.13

▼15.13.1

What would happen if line 29 in Listing 15.19 is removed?

The key events would not be received by map.

Hide Answer Read Answer

▼15.13.2

What would happen if map is replaced by scene in line 21 in Listing 15.19?

The program would work fine becuase scene is a top-level container. So it can receive key events.

Hide Answer Read Answer

▼15.13.3

What would happen if map is replaced by primaryStage in line 21 in Listing 15.19?

The program would not compile, because Stage cannot receive key events.

Hide Answer Read Answer