Computational Expression

Graphics

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19 September, 2018
Java Graphics

- Graphics can be simple or complex, but they are just data like a text document or sound.
- Java is pretty good at graphics, especially for the web and small devices like phones.
JavaFX

- JavaFX is a set of graphics and media packages.
- It allows developers to design, create, test, debug, and deploy applications that operate consistently across diverse platforms.
- JavaFX API provides numerous graphing features.
- Use of extends keyword uses the concept of inheritance
Inheritance Idea

- When you want to create a new class and there is already a class that includes some of the code that you want, you can derive your new class from the existing class.

- In doing this, you can reuse the variables and methods of the existing class without having to write them yourself.
public class HelloJavaFX extends Application {
    // Creates and displays two Text objects in a JavaFX window.
    public void start(Stage primaryStage) {
        Text hello = new Text(50, 50, "Hello, JavaFX!");
        Text question = new Text(120, 80, "How’s it going?");

        Group root = new Group(hello, question);
        Scene scene = new Scene(root, 300, 120, Color.LIGHTGREEN);

        primaryStage.setTitle("A JavaFX Program");
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    // Launches the JavaFX application.
    public static void main(String[] args) {
        launch(args);
    }
}
There are two methods: the `main` method and the `start` method.
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- `main` method is used to call the `launch` method of the `Application` class in JavaFX.
JavaFX API

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- main method is used to call the launch method of the Application class in JavaFX.
- launch method then calls the start method after some initial background set up.
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- main method is used to call the launch method of the Application class in JavaFX.
- launch method then calls the start method after some initial background set up.
- start method is typically used to set up and display the primary window.
JavaFX

- A Stage is a window. Multiple stages can be used in a single program.
- The primary Stage is created automatically and passed to the start method.
JavaFX

- A Stage is a window. Multiple stages can be used in a single program.
- The primary Stage is created automatically and passed to the start method.
- A scene displays a single element, often referred to as the root node.
- Root node may contain other nodes (which in turn contain other nodes, etc.).
Java Graphics

JavaFX

- A Scene takes four parameters:
  1. the root node to be displayed,
  2. the height of the scene,
  3. the weight of the scene,
  4. scene’s background color.

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JavaFX

- A Scene takes four parameters:
  1. the root node to be displayed,
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  4. scene’s background color.

- Background color uses Color class that has pre-built colors.

- A Group can contain objects (such as Text objects).
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Shapes in JavaFX are implemented by classes in the `javafx.scene.shape` package.

Objects can be added to a scene to be displayed.

Need to specify the position and the size of the shape when creating shapes.
JavaFX Shapes

// line drawn from point (0,0) to point (100,200)
Line line = new Line(0, 0, 100, 200);

// 100 x 200 rectangle with upper-left corner at point (0,0)
Rectangle rect = new Rectangle(0, 0, 100, 200);

// circle with radius of 10 and center at (100,100)
Circle circle = new Circle(100, 100, 10);

// ellipse with center (50,50), horizontal radius of 100 and vertical radius of 40
Ellipse ellipse = new Ellipse(50, 50, 100, 40);

// fill the shape with specified color
ellipse.setFill(Color.BLUE);