CSCI 2120:
Software Design & Development II

UNIT4: UI management

GUI framework

JavaFX Core: Properties

Overview

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Introduction

- A *JavaFX Property* is a special kind of member variable for JavaFX nodes. JavaFX properties are typically used to contain node properties such as X and Y position, width and height, text, children and other central properties of JavaFX nodes.

- You can attach change listeners to JavaFX properties so other components can get notified when the value of the property changes, and you can bind properties to each other so when one property value changes, so does the other.

- In this JavaFX property lecture we will explain how JavaFX properties work, and how to use them.

JavaFX Property Example

Here is a JavaFX GUI example showing how to access the `widthProperty` and `prefWidthProperty` of a **JavaFX Pane**, as well as adding a change listener to both.

Notice how one of the change listeners is implemented as an **anonymous Java class**, and the other as a **Java Lambda Expression**.

This is just to show you two different ways of achieving the same goal of attaching an event listener to a JavaFX property.

JavaFX Property Example

```
import javafx.application.Application;
import javafx.beans.property.DoubleProperty;
import javafx.beans.property.ReadOnlyDoubleProperty;
import javafx.beans.value.ChangeListener;
import javafx.beans.value.ObservableValue;
import javafx.scene.Scene;
import javafx.scene.layout.Pane;
import javafx.stage.Stage;

public class PropertyExample extends Application {
   public static void main(String[] args) {
       Launch(args);
   }

   public void start(Stage primaryStage) {
       Pane pane = new Pane();
       ReadOnlyDoubleProperty widthProperty = pane.widthProperty();
       widthProperty.addListener( new ChangeListener<Number> (){
           @Override
           public void changed( ObservableValue<? extends Number> observableValue, Number oldVal, Number newVal) {
               System.out.println("widthProperty changed from "+oldVal.doubleValue()+" to "+newVal.doubleValue());
           }
       });

       DoubleProperty prefWidthProperty = pane.prefWidthProperty();
       prefWidthProperty.addListener(
               (ObservableValue<? extends Number> prop, Number oldVal, Number newVal) -> {
                   System.out.println("prefWidthProperty changed from "+oldVal.doubleValue()+" to "+newVal.doubleValue());
               });
       prefWidthProperty.set(123);

       Scene scene = new Scene(pane, 1024, 800, true);
       primaryStage.setScene(scene);
       primaryStage.setTitle("2D Example");
       primaryStage.show();
   }
}
```

Code Explanation:

When the instruction `prefWidthProperty.set(123);` is called, the `prefWidthProperty` change listener will get called. Additionally, every time the UI is resized then the `Pane` is resized too, and the `widthProperty` change listener will get called.

END