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CSD405

Module 7 Assignment

JavaFX: HBox and VBox

JavaFX is module, or a set of packages used to build GUI (graphical user interfaces) in Java. It is open-source and cross platform, enabling users to build desktop, web, and mobile applications. While initially released in 2008, it has been continuously updated, providing modern and performant tools for GUI development for the Java programmer.

JavaFX uses a hierarchical structure to build UI components. At the base, there is the Stage, which is basically the window that is drawn on the screen that everything else is placed upon. Then there is the Scene which is where graphics are drawn. On top of the Scene is the Scene Graph, which holds a hierarchical structure of nodes, starting from the root node, then branch nodes, and leaf nodes.

The Node class represents any visual object that can be drawn on the screen, such as a button, label, or text field. They are organized within the scene graph. The Node structure is built by creating instances of various Node subclasses (labels, buttons, etc.) and adding them to a scene. For example, an HBox can contain multiple Labelobjects, which can each contain other nodes such as text fields or buttons as well as methods that customize them. All classes in JavaFX inherit from the Node class, including HBox, VBox, which gives us the ability to customize the layout of the scene graph nodes on the screen. HBox and VBox are two of the classes provided by JavaFX for defining where items are put in the node structure.

The HBox (horizontal box) class creates an object that orders its children in a horizontal row. It can take in all sorts of layout UI objects, like labels, text boxes, and buttons. Once the HBox object has been created, the getAllChildren().addAll() method is used to add items to the HBox by passing them into the addAll() method. There are many properties and methods that can be used to customize and style the HBox, on top of all the methods that are inherited by its super classes. The setSpacing() method takes a double and puts that amount of space between the items in the HBox. HBox also has several other properties that can be used to customize its layout. The setAlignment() determines how items are aligned within the box. For example, you can set the alignment to Pos.CENTER to center all items. The setPadding() method adds space between the content and the edges of the box. The setPrefHeight() and setPrefWidth() methods set the preferred height and width of the box.

VBox (vertical box) is used for laying out its children in a vertical column. It has several properties that can be used to customize its layout, including the same setAlignment, setPadding, setPrefHeight, and setPrefWidth that HBox has. Unlike HBox, the spacing is applied below the item as opposed to the right of the item.

In the attached code example, you can see how HBox and VBox are used to define where items are placed on the scene. There are 6 label objects created numbered 1-6. Labels 1-3 were added to the HBox object and modified by the setSpacing and setAlignment methods. Labels 4-6 were added to the VBox and modified with the setSpacing and setAlignment methods as well.

HBox and VBox are two of the classes provided by JavaFX for defining where items are to be arranged on the scene. They provide a way to layout components in both horizontal and vertical directions, with many methods available for customization.

A screen shot of a computer

Description automatically generated

References:

<https://openjfx.io/javadoc/23/javafx.graphics/javafx/scene/layout/HBox.html>

<https://www.geeksforgeeks.org/javafx-hbox-class/>

<https://4js.com/online_documentation/fjs-gst-2.50.02-manual-html/c_gst_formdesigner_widgetlist_018.html>

<https://www.w3schools.com/java/java_packages.asp>

<https://en.wikipedia.org/wiki/JavaFX#:~:text=JavaFX%20is%20a%20software%20platform,%2C%20iOS%2C%20and%20Android%20devices>.

<https://www.youtube.com/watch?v=As7TEjqJ3Ao>