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Assignment 11.2: JavaFX Features

# JavaFX: ScrollBar and BorderPane

JavaFX is a graphical user interface framework that allows Java programmers to develop and customize their own web, desktop, or mobile-based applications that can be created and launched for any operating system. JavaFX has many robust features that allow a programmer to create anything they put their mind to.

JavaFX features range from layout control to touchscreen support, and even more advanced capabilities such as animations, CSS styling, 3D graphics, and data visualization. JavaFX is still being expanded on and developed to this day, with a broad and active community allowing programmers to find support and help with any application they want, making it an appealing space for new learners to get help and experienced programmers to share tips and tricks. Due to being open-source, it is a popular and accessible choice.

One of the many features JavaFX offers is ScrollPane. ScrollPane is a JavaFX feature that anyone who has used a website before likely has experience with. Webpages and applications will have objects and information whose size eclipses the application or device's display size. The ScrollPane fixes this issue by allowing the user to pan in any direction the content allows, enabling them to access the parts of the information that wouldn't be visible otherwise. The user can navigate directly with panning, where the user can select any part of the content and drag the content accordingly, or indirectly using scroll bars, which allow the user to scroll in increments up and down, left and right. The developer can integrate types of ScrollPane easily. Direct panning can be established through .setPannable(true), while scroll bars are established through .setContent().

ScrollPanes descends from the control class within JavaFX, allowing the user to directly control parts of the UI, without first needing to adjust the code. Like many other features of JavaFX, ScrollPane gives complete control to the programmer. The programmer can choose to specify the policy of the scroll bars, whether they are available continuously, never, or only when the content is too large for the display. The developer can choose to allow only horizontal scroll ability via HBar, such as sp.setHbarPolicy(ScrollBarPolicy.ALWAYS). By setting the ScrollBar policy for HBar to ALWAYS, the horizontal scroll bar will always be present, even if there is nothing to scroll through. Likewise, the developer can set the vertical scroll bar through VBar, and choose to set the policy to never through the NEVER keyword. In today's age, where there is no guarantee of what type of output display the user has access to, ScrollPane is a lifesaver for ensuring the application is accessible to all, no matter what device they may be using.

Another key class in JavaFX is the layout class, which allows the programmer to organize and customize the interface. BorderPane is a part of JavaFX's layout class. It separates the output page into five nodes: the top, right, left, center, and bottom. These nodes can be filled with content, buttons, or anything the programmer needs to go into those sections. BorderPanes are often used in webpages to separate content into easy-to-navigate sections. For example, if a developer wanted to replicate an app based on YouTube using JavaFX, they could use BorderPane to separate the content in the classic YouTube style. The top pane could hold the search bar, the left and right panes could display recommended videos or playlists, the center pane could play the main video, and the bottom pane could host additional navigation tools or ads.

The BorderPane class is simple and intuitive. Different panes can be created and assigned using the set keyword, depending on which area you want the pane in, for example, .setCenter(). The argument passed to the set keyword will then populate inside that pane in the application. That argument could be text, an image, a ScrollPane, or any other supported JavaFX component, allowing the developer to combine JavaFX features as needed.

JavaFX does have a learning curve; however, the control it gives programmers over creating rich, in-depth graphical user interfaces makes it well worth the hurdle to learning. Some NASA programs have even been created through JavaFX (Wielenga & Phillips, 2014), showcasing its customizability and reliability. From passion projects to simple games to in-depth scientific tools, the uses of JavaFX are endless.

**References:**

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