Introduction To JavaFX

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WHAT IS JAVAFX?

JavaFX is a set of graphics libraries for creating GUI applications using Java.

JavaFX simplifies the creation of visually appealing applications.

A BRIEF HISTORY

AWT (abstract window toolkit) introduced in jdk1.1 for GUI programming

In jdk1.2 java Swing was introduced

JavaFx script was developed in 2008 using JavaFX script language.

From 2014 JavaFx was made part of jdk8

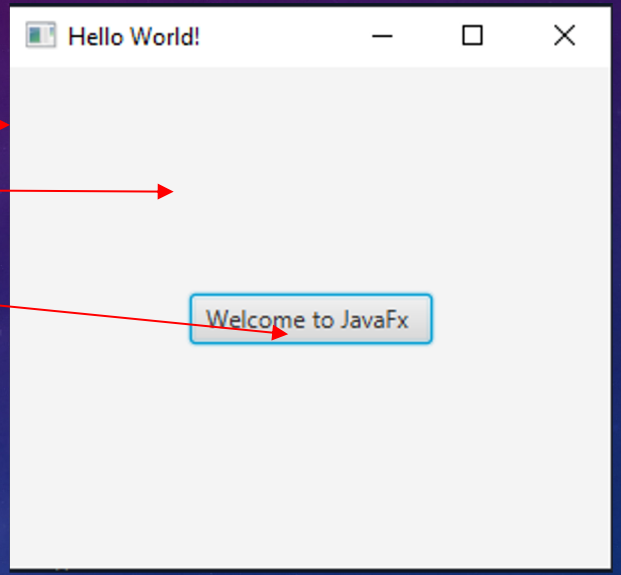
WHY JAVAFX?

- Uses only Java
- Cross platform applications.
- Easy to develop
- Faster development
- Supports graphics, audio, video and web services
- Runs as a stand alone application
- Supports MVC architecture
- Supports FXML

JAVAFX APPLICATION STRUCTURE

Three main components

- Stage
- Scene
- Nodes



STAGE

- A Stage is the container for the scenes.
- A primary stage is constructed by the platform.
- Additional stages can also be created.
- For multiple windows , multiple stages can be created

SCENE

To display anything on a stage in a JavaFX application a scene is needed.

Each stage has a scene .

A stage can show multiple scenes but only one at a time.

Each scene has a scene graph attached to it

Scene Graph

All components of the application must be attached to a scene.

The scene must be attached to a stage for the whole scene to be visible.

The total object graph of all the controls, layouts etc. attached to a scene is called the *scene graph*.

NODES

- All components attached to the scene graph are called nodes such as Button, Text, Image etc are examples of nodes
- All nodes are subclasses of a JavaFX class called javafx.scene.Node .
- There are two types of nodes:
  - Branch nodes and
  - leaf nodes.
- A branch node is a node that can contain other nodes (child nodes). Branch nodes are also referred to as parent nodes because they can contain child nodes.
- A leaf node is a node which cannot contain other nodes.

LAYOUT

Layouts are important to arrange elements in a application in a proper manner

Fig- Real world example of poorly arranged elements

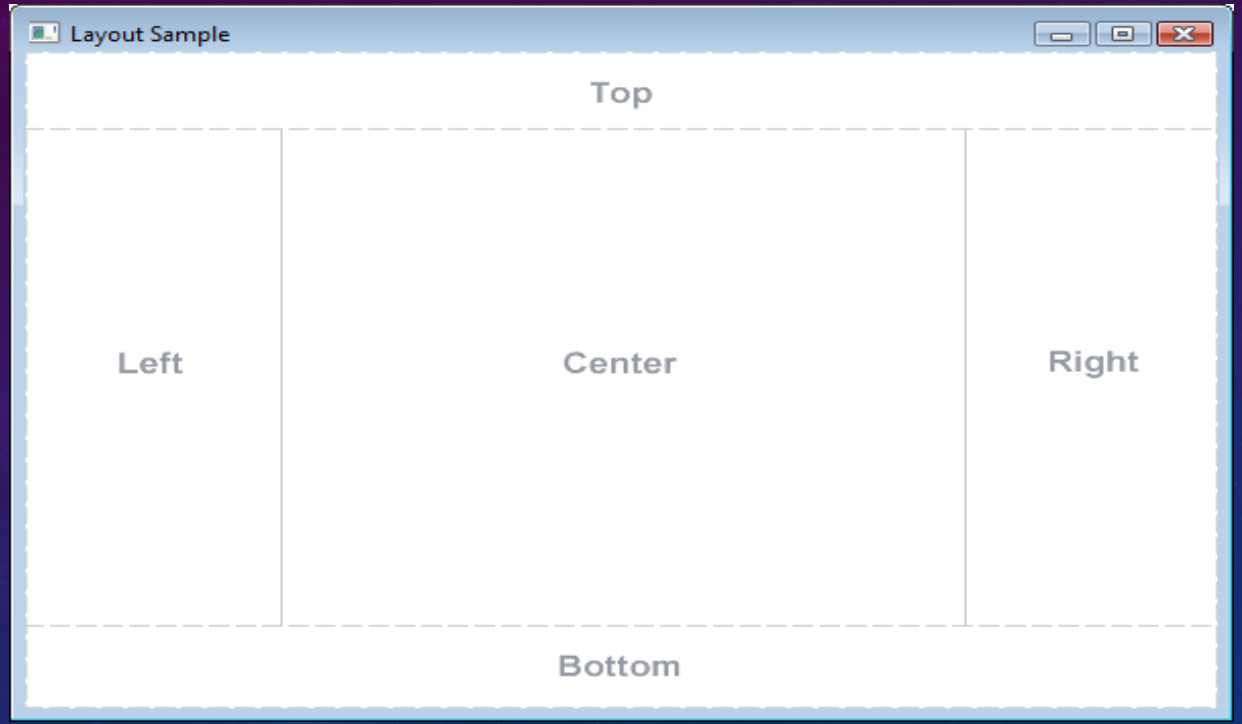
LAYOUT

Some examples of layouts used in JavaFX

- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane

LAYOUT

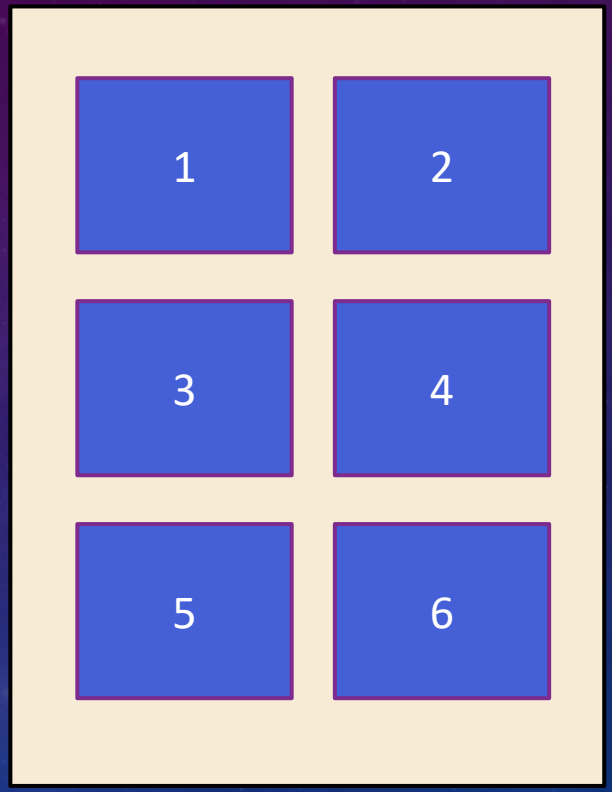
- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane



Border pane gives different options to Organize nodes like top, left, right, centre and the bottom of the screen.

LAYOUT

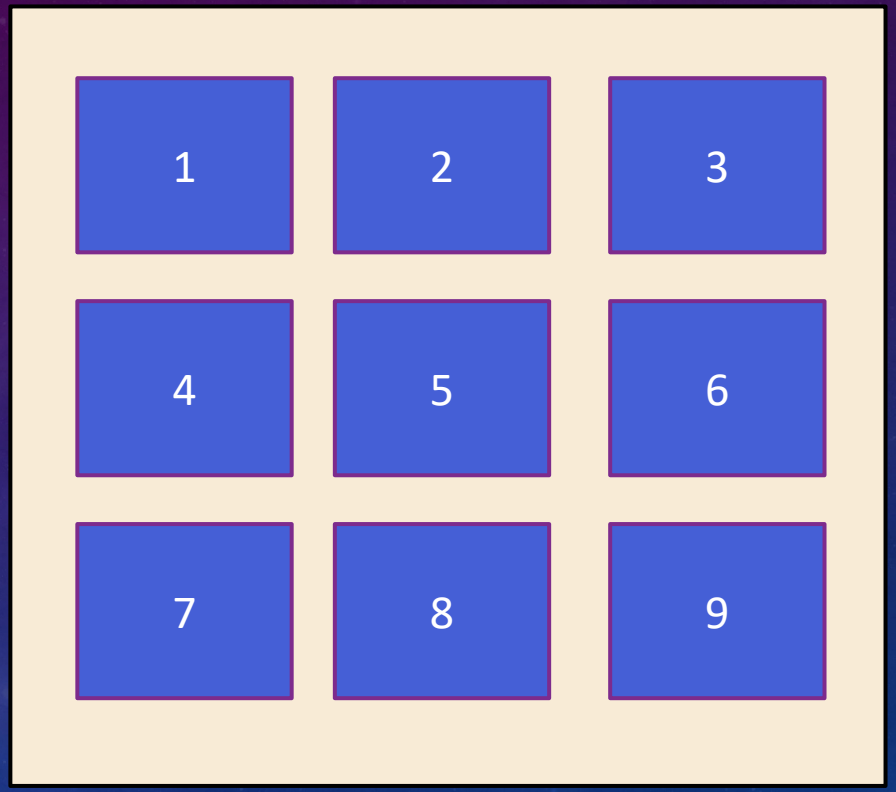
- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane



Flowpane Organizes the nodes in the horizontal rows according to the available horizontal spaces. If space is not there it puts the nodes to the next line .

LAYOUT

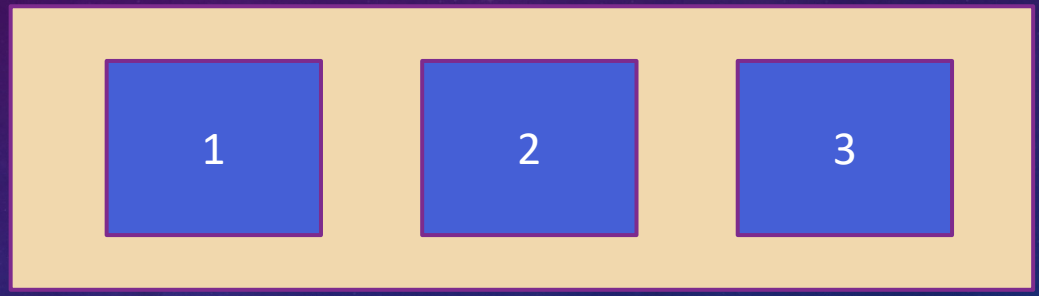
- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane



Grid pane organises nodes in rows and columns

LAYOUT

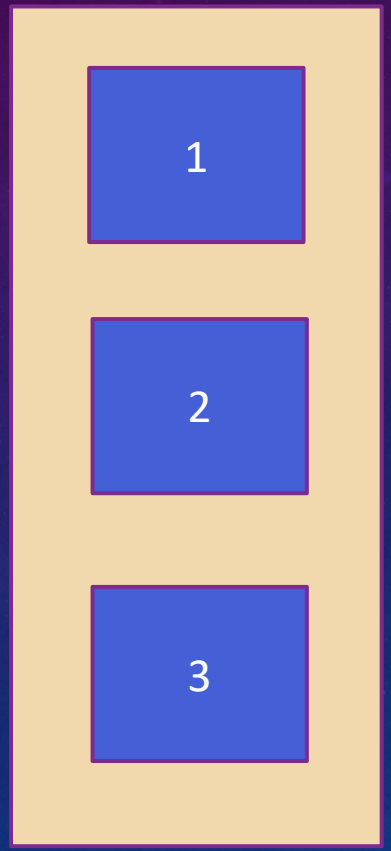
- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane



In hbox the nodes are put horizontally in a single row

LAYOUT

- BorderPane
- FlowPane
- GridPane
- HBox
- VBox
- StackPane



In Vbox the nodes are put vertically in a single column

LAYOUT

- BorderPane
- FlowPane
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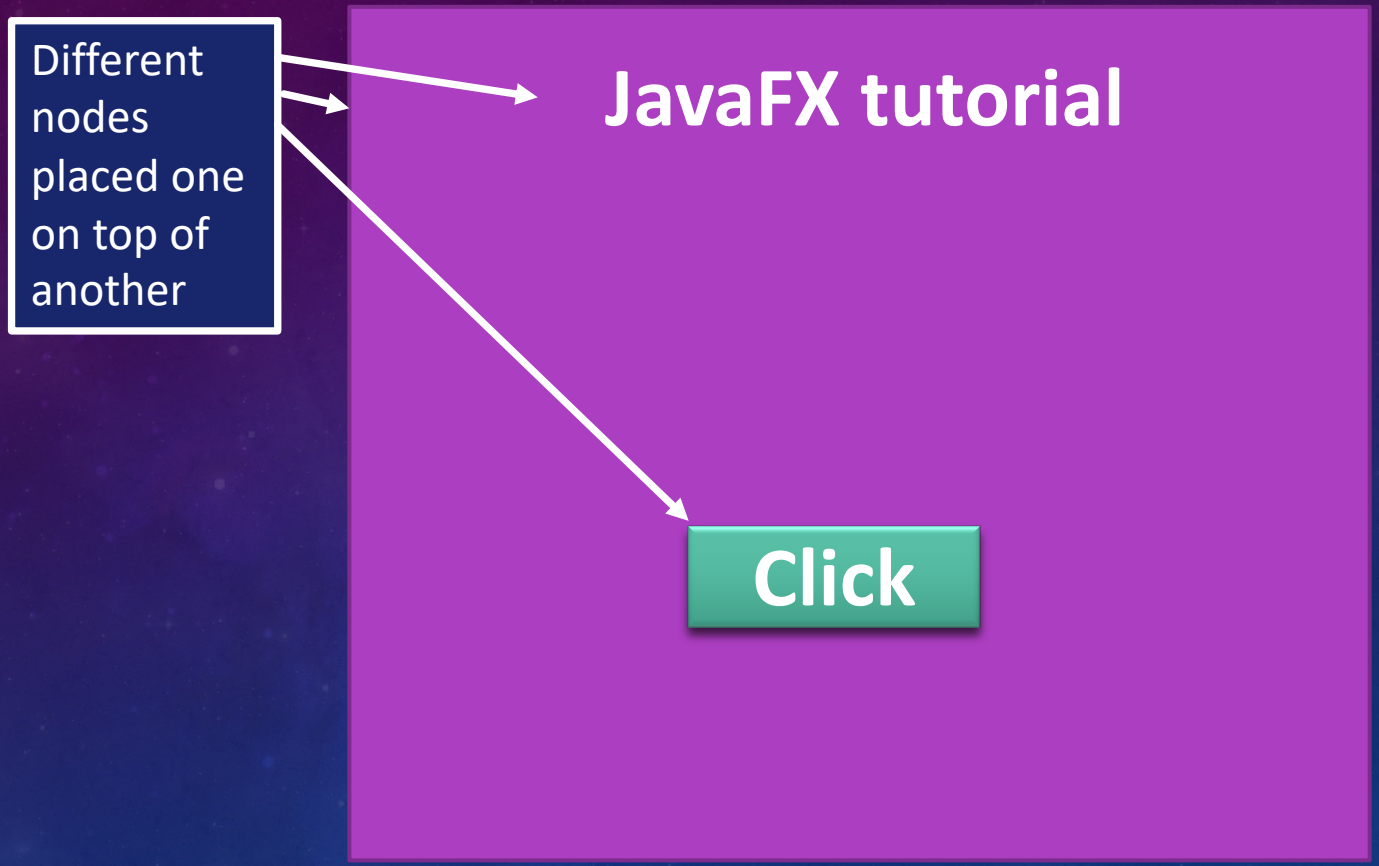
- HBox
- VBox
- StackPane



In stack pane the nodes are put one upon the other in a stack.

EVENTS

- Mouse event
  - When we do things like clicking the mouse buttons its called a mouse event.
- Key event
  - When we press some key on the keyboard it is also an event..ie. a key event
- Drag event
  - When we drag an object in the scene its called a drag event
- Window event
  - Making the window visible or hidden comes under window event

EVENT HANDLING

Every event has three information-

- Target- Node on which event has occurred (eg- a button)
- Source-The source on which event is generated. (eg- mouse)
- Event Type-Type of occurred event (eg- mouse click)

JAVAFX CONTROLS

- JavaFX controls are JavaFX components which provide some kind of control functionality inside a JavaFX application.
- All necessary components for javaFX controls are available in package javafx.scene.control

JAVAFX CONTROLS

Some JavaFx controls are as follows-

- Button
- Checkbox
- Label
- List view
- Radio button
- Scroll pane
- Text field
- Toggle button
- Tree view
- Menu basics

THANK YOU