JavaFX

Prof. Michele Loreti

Programmazione Avanzata

Corso di Laurea in Informatica (L31)

Scuola di Scienze e Tecnologie

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https://openjfx.io

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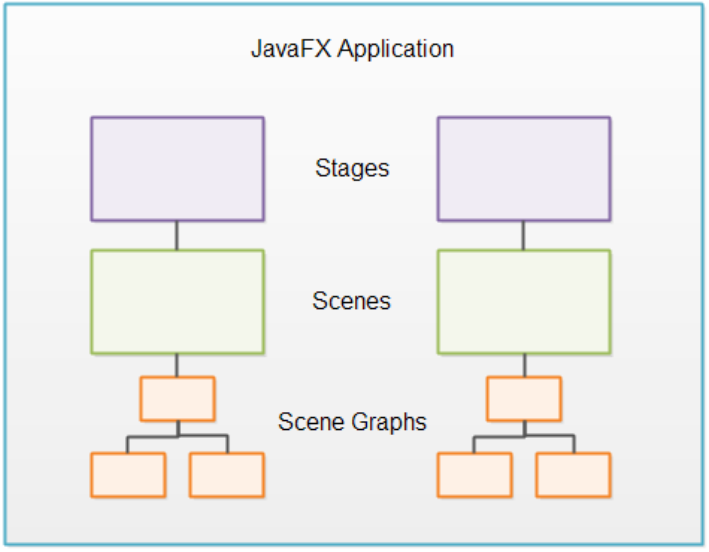
JavaFX comes with a large set of built-in GUI components, like buttons, text fields, tables, trees, menus, charts and much more.

JavaFX components can be styled using CSS, and we can use FXML to compose a GUI instead of doing it in Java code.

JavaFX Overview

- A JavaFX application contains one or more stages which corresponds to windows.



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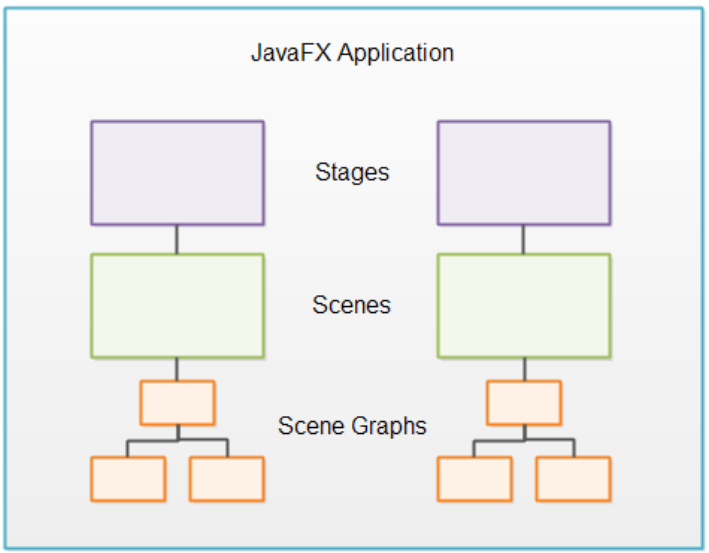

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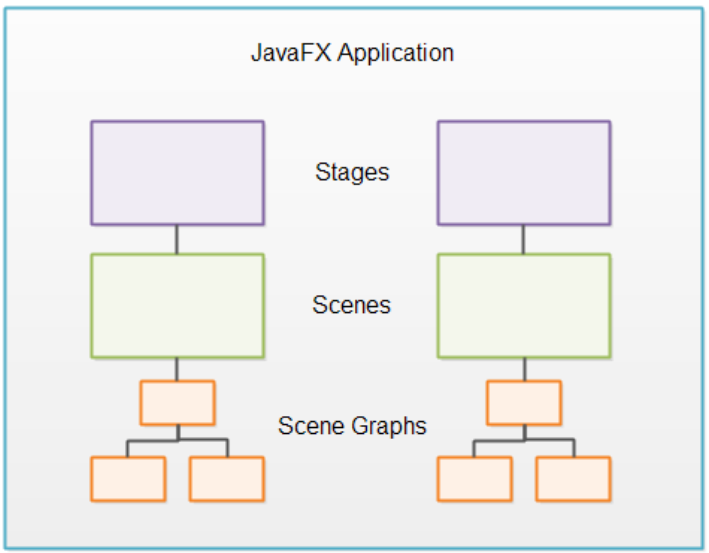
- Each stage has a scene attached to it.
- Each scene can have an object graph of controls, layouts etc. attached to it, called the scene graph.



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Each stage is represented by a Stage object inside a JavaFX application. A JavaFX application has a primary Stage object which is created for you by the JavaFX runtime.

A JavaFX application can create additional Stage objects if it needs additional windows open. For instance, for dialogs, wizards etc.

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A scene is represented by a Scene object inside a JavaFX application. A JavaFX application must create all Scene objects it needs.

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There are two types of nodes:

- Branch nodes: are nodes that can contain other nodes (child nodes). They are also referred to as parent nodes because they can contain child nodes.
- Leaf node: is a node which cannot contain other nodes.

JavaFX: Controls

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Controls are usually nested inside some JavaFX layout component that manages the layout of controls relative to each other.

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A layout component must be attached to the scene graph of some `Scene` object to be visible.

It is possible to nest layout components inside other layout components.

JavaFX: Setting up Gradle

```
plugins {
    ...
    id 'org.openjfx.javafxplugin' version '0.0.7'
}

javafx {
    version = "12.0.1"
    modules = [ 'javafx.controls' ]
}
```

JavaFX: Application

A JavaFX application needs a primary launch class. This class has to extend the `javafx.application.Application`.

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All subclasses of the `Application` class must implement the abstract `start()` method of the `Application` class.

The `start()` method is called when the JavaFX application is started:

```
@Override
public void start(Stage primaryStage) throws Exception {
    primaryStage.setTitle("My First JavaFX App");

    primaryStage.show();
}
```

JavaFX: Application

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public static void main(String[] args) {
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The launch() method will detect from which class it is called.

JavaFX: Adding a Scene

To display elements we have to attach them a Scene.

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Label label = new Label("Hello World, JavaFX !");
Scene scene = new Scene(label, 400, 200);
primaryStage.setScene(scene);
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The first parameter of the Scene constructor is the root element of the scene graph.

The scene graph is a graph like object structure containing all the visual components to be displayed in the JavaFX application.

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Creating a Stage:

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Creating a Stage:

```
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Showing a Stage:

- show()
- showAndWait()

JavaFX: Stage

Set a Scene: To display elements in a stage, you have to equip it with a scene...

```
VBox vBox = new VBox(new Label("A JavaFX Label"));
Scene scene = new Scene(vBox);

Stage stage = new Stage();
stage.setScene(scene);
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Set title:

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Set title:

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Set position:

```
stage.setX(50);
stage.setY(50)
```

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Set size:

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stage.setWidth(600);
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Modality: The Stage modality determines if the window representing the Stage will block other windows opened by the same JavaFX application.

- stage.initModality(Modality.APPLICATION_MODAL)
- stage.initModality(Modality.WINDOW_MODAL)
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Owner: A JavaFX Stage can be owned by another Stage.

```
stage.initOwner(primaryStage);
```

JavaFX: Stage

Stage Style: You can set the style of a JavaFX Stage via its initStyle() method. There are a set of different styles you can choose from:

- DECORATED
- UNDECORATED
- TRANSPARENT
- UNIFIED
- UTILITY

You can set the style by using the `initStyle` method.

JavaFX: Scene

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A JavaFX Scene can be attached to only a single Stage at a time, and Stage can also only display one Scene at a time.

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FXML file can be generated by using tools supporting design of GUI (see SceneBuilder).

JavaFX: FXML
Example

```
<?xml version="1.0" encoding="UTF-8"?>
<?import javafx.scene.layout.VBox?>
<?import javafx.scene.control.Label?>

<VBox>
    <children>
        <Label text="Hello world FXML"/>
    </children>
</VBox>
```

JavaFX: FXML

```
FXMLLoader loader = new FXMLLoader();
loader.setLocation(anUrl);
VBox vbox = loader.<VBox>load();

Scene scene = new Scene(vbox);
primaryStage.setScene(scene);
primaryStage.show();
```

To be continued...