User Interfaces & Code Quality

Programming Principles 02 - Design

MINOLI DE SILVA

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Introduction to the Module

Aims and Objectives

The aim of this module is to provide students with the necessary knowledge in perfecting code in tried and tested quality techniques and also to learn user interface design and development in JavaFX.

Teaching and Learning

Duration – 12 weeks

Lecture – 24 hours

Lab – 24 hours (FT) / 12 hours (PT)

Self-Guided – 22 hours

What is a User Interface?

The user interface (UI) is the point of human-computer interaction and communication in a device.

Types of User Interfaces

The two main types of UI are,

- Graphical User Interface (GUI)
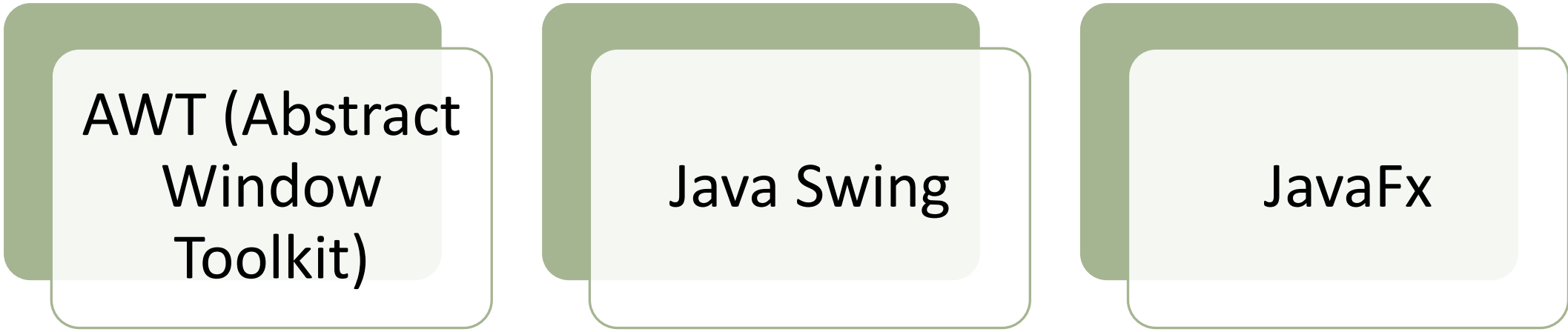
- Command Line Interface (CLI)

In addition to those,

Menu-driven Interfaces, Touch Interfaces, Voice UI, Touch UI, Form Based Interfaces, Natural Language Interfaces

..are also available.

What is JavaFx?

"JavaFX is a Java library that is used to develop Desktop applications as well as Rich Internet Applications (RIA). The applications built in JavaFX, can run on multiple platforms including Web, Mobile and Desktops."

Java GUI Toolkits

AWT (Abstract Window Toolkit)

Java Swing

JavaFx

JavaFX vs Java Swing

JavaFX	Java Swing
Less components	More components
GUI components with advanced look and feel	Standard UI components
Rich new toolkit	No new functionality introduced at present
Supports MVC but not consistent across components	Friendly with MVC

Java Swing Login Form
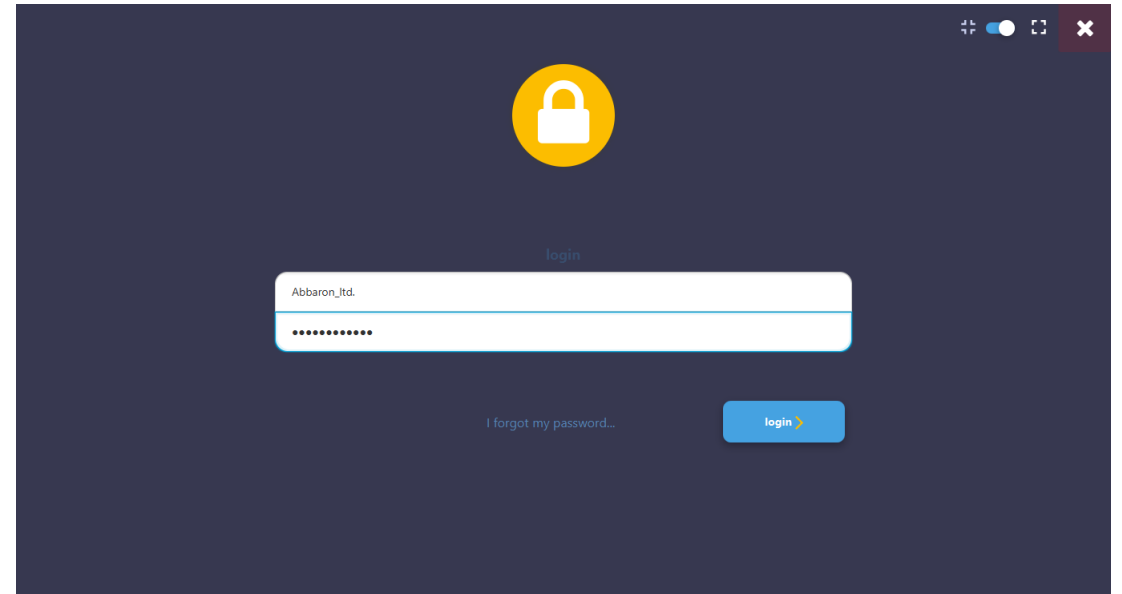
Java FX Login Form

Features of JavaFX

Java Library

FXML

Scene Builder

Web View

Built in UI Components

CSS Styling

Canvas API

Integrated Graphics Library

High Performance Media Engine

etc.

Requirements for JavaFX
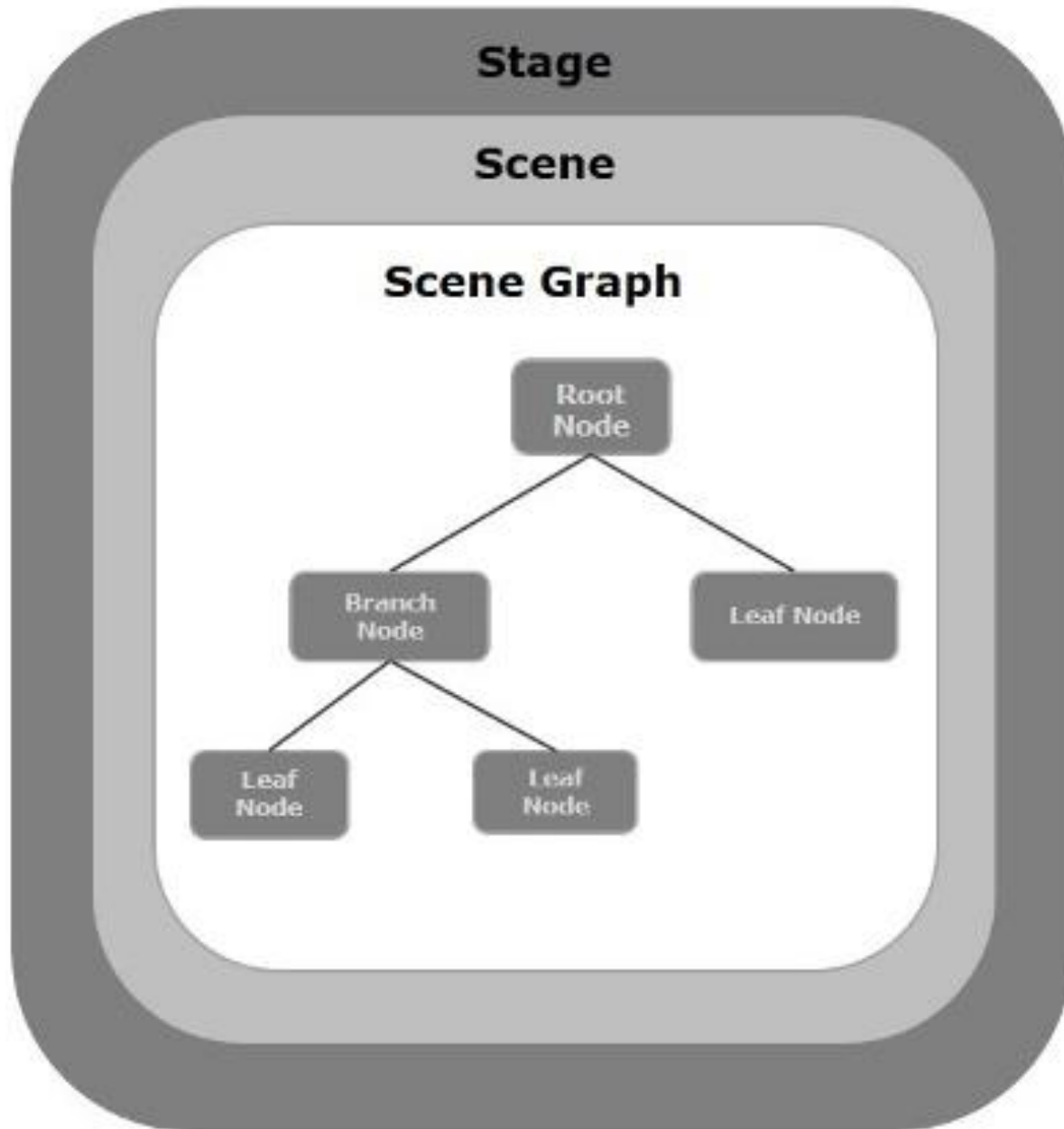
Prerequisites

Programming knowledge in Java

Software Requirements

JDK – Java Development Toolkit (JavaFX bundled with versions prior to Java 11)

IDE (Integrated Development Environment)
- JetBrains IntelliJ IDEA (Recommended)
- Eclipse

Scene Builder Application (http://gluonhq.com/products/scene-builder/)
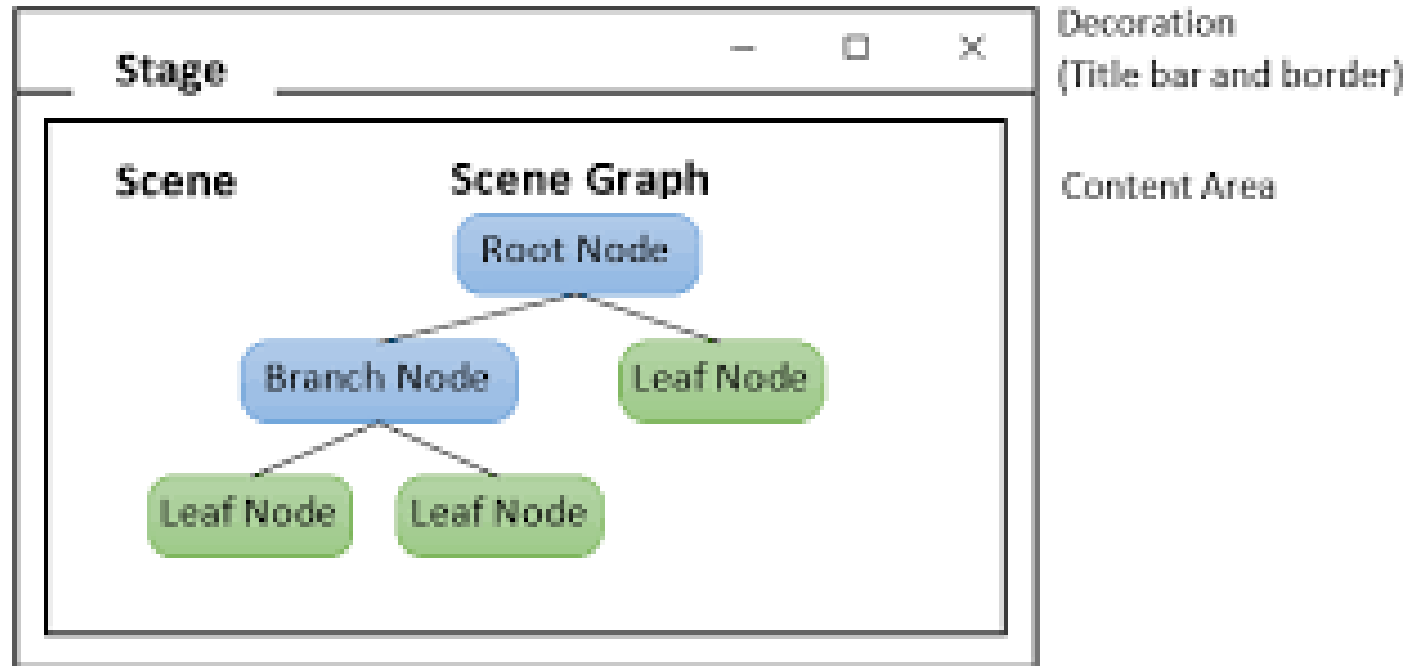
JavaFX Application Structure

Stage (javafx.Stage)

❑ Defines a window of the application

❑ Top level container of a JavaFX application

❑ Primary stage is created by the platform itself

Scene (javafx.Scene)

❑ A scene represents the physical contents of a JavaFX application.

❑ It contains all the contents of a scene graph.

Node

❏ Node is a class of javafx.scene package

❏ Super class of all the nodes

❏ 3 types of nodes
  ◦ Root Node
  ◦ Branch Nodes
  ◦ Leaf Nodes

❏ A node may include
  ◦ Geometrical 2D, 3D objects – circle, polygon, rectangle etc.
  ◦ UI Controls – Button, TextField, TextAre, Label
  ◦ Containers – Layout Panes such as Anchor Pane, Grid Pane
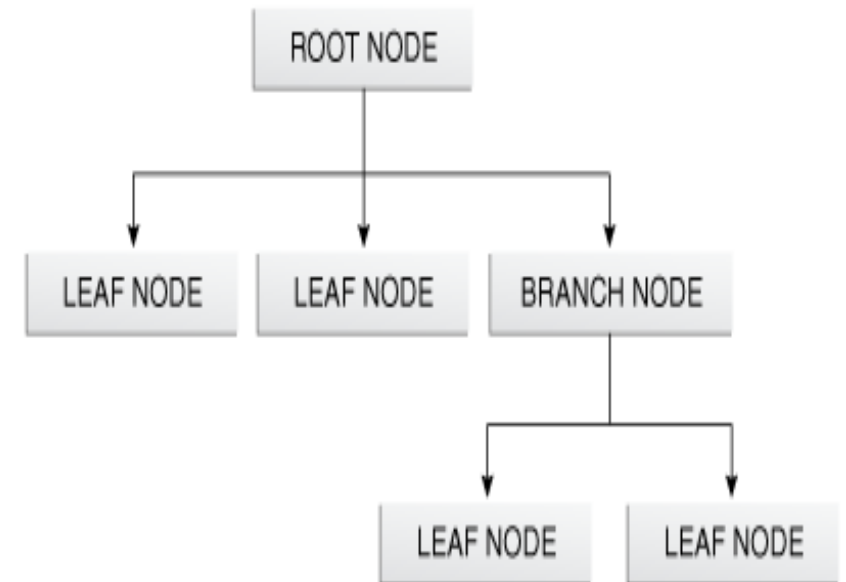 ◦ Media Elements - Audio, Video, Images

Types of Nodes

Root Node

The first Scene Graph is known as the Root Node

Branch Node/Parent Node

Nodes that contain child nodes are known as Branch Nodes

Leaf Node

Nodes without child nodes are known as Leaf Nodes

Simple GUI Demonstration

Thank You!