Madan Bhandari Memorial College

Department of Computer Science and Information Technology (B.Sc.CSIT)

Ninayak Nagar, New Baneshwor, Kathmandu

Practical Sheet

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Program No:- 09

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T.U.Roll.No. :- 24179

Title: Java FX demonstration.

Introduction:

Java FX - Application Structure

- Stage: A stage contains all the objects of a JavaFX application. It is represented by Stage class of the package javafx.stage.
- Scene: A scene represents the physical contents of a JavaFX application. It contains all the contents of a scene graph. The class Scene of the package javafx.scene represents the scene object.

Scene Graph and Nodes: A scene graph is a tree-like data structure representing the content of a scene. The Node class of the Javafx.scene represents a node in JavaFX, this class is the super class of all the nodes.

Types of nodes:

i) Root Node: The first scene is known as Root Node.

ii) Branch Node/Parent Node: The node with child node are known as branch/parent nodes.

iii) Leaf Node: The Node without child nodes is known as leafnode.

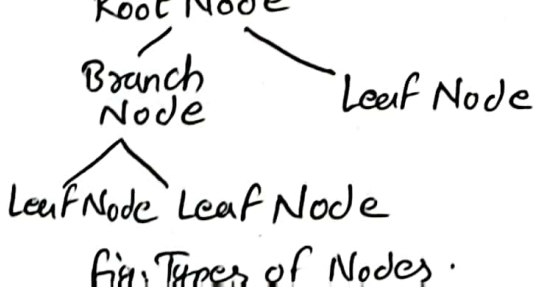


fig: Types of Nodes.

Comparision between JavaFX and Java Swing:

- Java Fx
→ Modern Approach : Integrated with Java, supports FXML for UI design.
→ Graphics and Animation : Uses hardware-accelerated graphics.
→ Scene Graph : Node-based structure.
→ Media Support : Built-in support for audio & video.

- Java Swing
→ Legacy Technology : Mature GUI toolkit.
→ Lighweight Components.
→ Event Handling.
→ Layout Manager.

JavaFX Layouts:

i) VBox → Vertical Arrangements
ii) HBox → Horizontal Arrangements
iii) Border Pane → Top, bottom, left, right and center regions
iv) Grid Pane → Grid-based layout.
v) Flow Pane → Flowing Arrangements.

Code:

Controller.java:

```
package hellofx;
import javafx.fxml.FXML;
import javafx.scene.control.Label;
public class Controller{
    @FXML
    private Label label;
    public void initialize(){
        String javaVersion = System.getProperty("java.version");
        String javaFxVersion = System.getProperty("javafx.version");
        label.setText("Hello, JavaFX "+javaFxVersion+"\nRunning
                on Java "+javaVersion+".");
    }
}
```

HelloFx.fxml:

```
<?xml version="1.0" encoding="UTF-8"?>
<?import javafx.scene.control.Label?>
<?import javafx.scene.layout.StackPane?>
<StackPane maxHeight="-Infinity" maxWidth="-Infinity" minHeight="
-Infinity" minWidth="-Infinity" prefHeight="400.0" prefWidth="600.0"
xmlns="http://javafx.com/javafx/18" xmlns:fx="http://javafx.com/fxml"
1" fx:controller="hellofx.Controller">
    <children>
        <Label fx:id="label" text="label"/>
    </children>
</StackPane>
```

Main.java

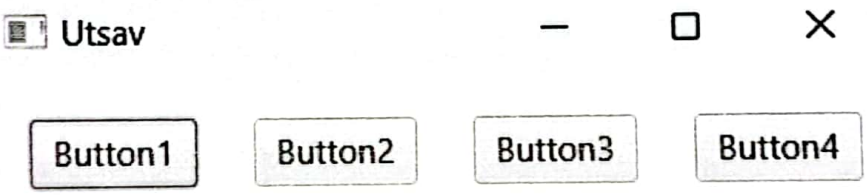
```
package hellofx;
import javafx.application.Application;
import javafx.fxml.FXMLLoader;
import javafx.scene.Parent;
import javafx.scene.Scene;
import javafx.stage.Stage;
public class Main extends Application{
    @Override
    public void start(Stage primaryStage) throws Exception{
        Parent root = FXMLLoader.load(getClass().getResource(
            "hellofx.fxml"));
        primaryStage.setTitle("Ulsan");
        primaryStage.setScene(new Scene(root, 400,300));
        primaryStage.show();
    }
    public static void main(String[] args){
        launch(args);
    }
}
```

Hello, JavaFX 8.0.391
Running on Java 1.8.0_391.

Flow Layout

Code:

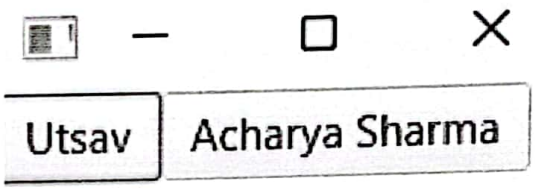
```
package hellofx;
import javafx.application.Application;
import javafx.scene.control.Button;
import javafx.scene.layout.FlowPane;
import javafx.geometry.Insets;
import javafx.collections.ObservableList;
import javafx.stage.Stage;
import javafx.scene.Scene;
public class Main extends Application{
    @Override
    public void start(Stage stage){
    Button button1 = new Button("Button 1");
    Button button2 = new Button("Button 2");
    Button button3 = new Button("Button 3");
    Button button4 = new Button("Button 4");
    FlowPane flowPane = new FlowPane();
    flowPane.setHgap(26);
    flowPane.setMargin(button1, new Insets(20,0,20,20));
    ObservableList list = flowPane.getChildren();
    list.addAll(button1, button2, button3, button4);
    Scene scene = new Scene(flowPane);
    stage.setTitle("Utsav");
    stage.setScene(scene);
    stage.show();
    }
    public static void main(String[] args){
        launch(args);
    }
}
```


Utsav
Button1
Button2
Button3
Button4

Hbox Layout

Code:

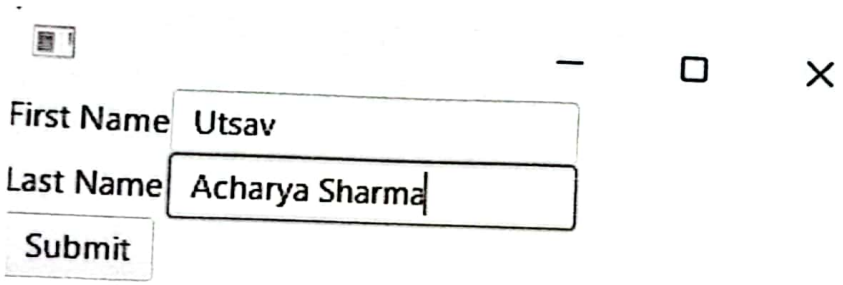
```
package hellofx;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.layout.HBox;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
public class Main extends Application{
    @Override
      public void start(Stage primaryStage) throws Exception{
       Button btn1 = new Button("Utsav");
       Button btn2 = new Button("Acharya Sharma");
       HBox root = new HBox();
       Scene scene = new Scene(root,200,200);
       root.getChildren().addAll(btn1,btn2);
       primaryStage.setScene(scene);
      primaryStage.show();
   }
   public static void main(String[] args){
         launch(args);
   }
}
```


Utsav
Acharya Sharma

Grid Layout

Code:

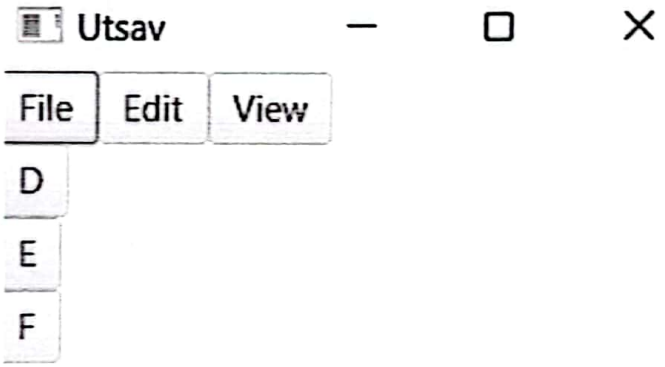
```
package hellofx;
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.control.Label;
import javafx.scene.control.TextField;
import javafx.stage.Stage;
public class Main extends Application{
    @Override
    public void start(Stage primaryStage) throws Exception{
        Label first_name = new Label("FirstName");
        Label last_name = new Label("LastName");
        TextField tf1 = new TextField();
        TextField tf2 = new TextField();
        Button Submit = new Button("Submit");
        GridPane root = new GridPane();
        Scene scene = new Scene(root, 400, 200);
        root.addRow(0, first_name, tf1);
        root.addRow(1, last_name, tf2);
        root.addRow(2, Submit);
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    public static void main(String[] args){
        launch(args);
    }
}
```


First Name
Utsav
Last Name
Acharya Sharma
Submit

Assignment

Code:

```
package · hellofx;
import javafx.application.Application;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.layout.BorderPane;
import javafx.scene.layout.HBox;
import javafx.scene.layout.VBox;
import javafx.stage.Stage;
public class Main extends Application{
    @Override
    public void start(Stage primaryStage){
        BorderPane borderPane= new BorderPane();
        HBox topMenu = new HBox();
        topMenu.getChildren().addAll(createButton("File"),create
            Button("Edit"),createButton("View"));
        borderPane.setTop(topMenu);
        VBox leftMenu = new VBox();
        leftMenu.getChildren().addAll(createButton("D"),create
            Button("E"),createButton("F");
        borderPane.setLeft(leftMenu);
        Scene scene = new Scene(borderPane, 300,200);
        primaryStage.setTitle("Usov");
        primaryStage.setScene(scene);
        primaryStage.show();
    }
    private Button createButton(String text){
        return new Button(text);
    }
    public static void main(String[] args){
        launch(args);
    }
}
```


Utsav
File
Edit
View
D
E
F