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\* This program defines two classes: A NumberConversionCalculator class

\* and a NumberConversion class. The NumberConversionCalculator class

\* sets up the GUI for the methods defined in the NumberConversion class

\* that actually allow for the base conversions to occur.

\*

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\*/

// All required imports

import javafx.application.Application;

import javafx.event.\*;

import javafx.scene.Scene;

import javafx.scene.control.Label;

import javafx.scene.control.TextField;

import javafx.scene.control.Button;

import javafx.scene.layout.GridPane;

import javafx.scene.paint.Color;

import javafx.stage.Stage;

import javafx.geometry.Insets;

public class NumberConversionCalculator extends Application {

private TextField inputTF;

private TextField base1TF;

private TextField base2TF;

private TextField resultTF;

private Label errMsg;

public void start(Stage myStage) {

// Set title

myStage.setTitle("Number Base Conversion Calculator");

// Create new GridPane and set padding, vertical, and horizontal spacing

GridPane pane = new GridPane();

pane.setPadding(new Insets(10, 10, 10, 10));

pane.setVgap(5);

pane.setHgap(5);

// Create new scene

Scene myScene = new Scene(pane);

// Create Labels

Label label1 = new Label("Input Number: ");

Label label2 = new Label("Current input base \n(accepted values from 2-16): ");

Label label3 = new Label("Desired output base \n(accepted values from 2-16): ");

Label label4 = new Label("Result: ");

errMsg = new Label("Please enter valid inputs");

errMsg.setTextFill(Color.web("#FF0000"));

errMsg.setVisible(false);

// Create TextFields

inputTF = new TextField();

base1TF = new TextField();

base2TF = new TextField();

resultTF = new TextField();

// Create Button

Button convert = new Button("Convert");

// Create event handler object

ButtonHandler buttonHandler = new ButtonHandler();

// Register event handler

convert.setOnAction(buttonHandler);

// Add all Labels, TextFields, and Button to GridPane

pane.add(label1, 0, 0);

pane.add(label2, 0, 1);

pane.add(label3, 0, 2);

pane.add(label4, 0, 3);

pane.add(errMsg, 0, 5);

pane.add(inputTF, 1, 0);

pane.add(base1TF, 1, 1);

pane.add(base2TF, 1, 2);

pane.add(resultTF, 1, 3);

pane.add(convert, 1, 5);

// Display

myStage.setScene(myScene);

myStage.show();

}

class ButtonHandler implements EventHandler<ActionEvent> {

private String input;

private int base1;

private int base2;

public void handle(ActionEvent a) {

try {

input = inputTF.getText();

base1 = Integer.parseInt(base1TF.getText());

base2 = Integer.parseInt(base2TF.getText());

resultTF.setText(NumberConversion.baseConvert(input, base1, base2));

errMsg.setVisible(false);

}

catch (Exception e) {

errMsg.setVisible(true);

}

}

}

public static void main( String[] args ) {

launch();

}

}

/\*\*

\* This class consists of methods that

\* convert numbers between different number

\* systems.

\*/

class NumberConversion {

public static char charFromVal(int num) {

if (num >= 0 && num <= 9)

return (char) (num + 48);

else

return (char) (num + 55);

}

public static int valFromChar(char c) {

if (c >= '0' && c <= '9')

return (int) c - '0';

else

return (int) c - 'A' + 10;

}

public static String baseConvert(String input, int base1, int base2) {

int temp = toDecimal(input, base1);

String result = fromDecimal(temp, base2);

return result;

}

public static String fromDecimal(int input, int base) {

String revResult = "";

while (input > 0) {

revResult += charFromVal(input % base);

input /= base;

}

String result = "";

for (int i = revResult.length() - 1; i >= 0; i--) {

result += revResult.substring(i, i + 1);

}

return result;

}

public static int toDecimal(String input, int base) {

int power = 1;

int num = 0;

for (int i = input.length() - 1; i >= 0; i--) {

num += valFromChar(input.charAt(i)) \* power;

power \*= base;

}

return num;

}

}