***SECTION 2.1 [PROGRAMMING]:***

***JAVA BANK:***

import java.awt.\*;

import java.awt.event.\*;

import javax.swing.\*;

import javax.swing.border.\*;

public class JavaBank extends JFrame {

/\*\*

\*

\*/

private static final long serialVersionUID = 1L;

// Make these variables publicly available

public String Name;

public int Accountnum;

public int Balance;

// JPanel for user inputs

private JPanel inputDetailJPanel;

// JLabel and JTextField for account name

private JLabel NameJLabel;

private JTextField NameJTextField;

// JLabel and JTextField for account number

private JLabel AccountnumJLabel;

private JTextField AccountnumJTextField;

// JLabel and JTextField for balance

private JLabel BalanceJLabel;

private JTextField BalanceJTextField;

// JLabel and JTextField for withdraw

private JLabel DepositJLabel;

private JTextField DepositJTextField;

// JLabel and JTextField for Withdraw

private JLabel WithdrawJLabel;

private JTextField WithdrawJTextField;

// JButton to create account

priate JButton CreateAccountJButton;

// JButton to delete account

private JButton DeleteAccountJButton;

// JButton to make transaction

private JButton TransactionJButton;

// JButton to display account

private JButton DisplayJButton;

// JLabel and JTextArea to display account details

private JLabel displayJLabel;

private static JTextArea displayJTextArea;

// constants

//public final static Maximum Accounts that can be created;

public final static int MaxAccounts = 10;

// one-dimensional array to store Account names as Empty or Used

static String AccountNames[] = new String[MaxAccounts];

// two-dimensional array to store Account details

static Account myAccounts[] = new Account[MaxAccounts];

static int noAccounts = 0;

// constructor

public JavaBank() {

for (int i=0; i <10; i++) {

AccountNames[i] = "EMPTY";

//System.out.println(AccountNames[i]);

}

createUserInterface();

}

// create and position GUI components; register event handlers

private void createUserInterface() {

// get content pane for attaching GUI components

Container contentPane = getContentPane();

// enable explicit positioning of GUI components

contentPane.setLayout(null);

// set up inputDetailJPanel

inputDetailJPanel = new JPanel();

inputDetailJPanel.setBounds(16, 16, 208, 250);

inputDetailJPanel.setBorder(new TitledBorder("Input Details"));

inputDetailJPanel.setLayout(null);

contentPane.add(inputDetailJPanel);

// set up NameJLabel

NameJLabel = new JLabel();

NameJLabel.setBounds(8, 32, 90, 23);

NameJLabel.setText("Name:");

inputDetailJPanel.add(NameJLabel);

// set up NameJTextField

NameJTextField = new JTextField();

NameJTextField.setBounds(112, 32, 80, 21);

NameJTextField.setHorizontalAlignment(JTextField.RIGHT);

inputDetailJPanel.add(NameJTextField);

// set up AccountnumJLabel

AccountnumJLabel = new JLabel();

AccountnumJLabel.setBounds(8, 56, 100, 23);

AccountnumJLabel.setText("Account Number:");

inputDetailJPanel.add(AccountnumJLabel);

// set up AccountnumTextField

AccountnumJTextField = new JTextField();

AccountnumJTextField.setBounds(112, 56, 80, 21);

AccountnumJTextField.setHorizontalAlignment(JTextField.RIGHT);

inputDetailJPanel.add(AccountnumJTextField);

// set up BalanceJLabel

BalanceJLabel = new JLabel();

BalanceJLabel.setBounds(8, 80, 60, 23);

BalanceJLabel.setText("Balance:");

inputDetailJPanel.add(BalanceJLabel);

// set up BalanceTextField

BalanceJTextField = new JTextField();

BalanceJTextField.setBounds(112, 80, 80, 21);

BalanceJTextField.setHorizontalAlignment(JTextField.RIGHT);

inputDetailJPanel.add(BalanceJTextField);

// set up DepositJLabel

DepositJLabel = new JLabel();

DepositJLabel.setBounds(8, 104, 80, 23);

DepositJLabel.setText("Deposit:");

inputDetailJPanel.add(DepositJLabel);

// set up DepositJTextField

DepositJTextField = new JTextField();

DepositJTextField.setBounds(112, 104, 80, 21);

DepositJTextField.setHorizontalAlignment(JTextField.RIGHT);

inputDetailJPanel.add(DepositJTextField);

// set up WithdrawJLabel

WithdrawJLabel = new JLabel();

WithdrawJLabel.setBounds(8, 128, 60, 23);

WithdrawJLabel.setText("Withdraw:");

inputDetailJPanel.add(WithdrawJLabel);

// set up WithdrawJTextField

WithdrawJTextField = new JTextField();

WithdrawJTextField.setBounds(112, 128, 80, 21);

WithdrawJTextField.setHorizontalAlignment(JTextField.RIGHT);

inputDetailJPanel.add(WithdrawJTextField);

// set up CreateAccountButton

CreateAccountJButton = new JButton();

CreateAccountJButton.setBounds(112, 152, 80, 24);

CreateAccountJButton.setText("Create");

inputDetailJPanel.add(CreateAccountJButton);

CreateAccountJButton.addActionListener(

new ActionListener() {

// event handler called when CreateAccountJButton

// is clicked

public void actionPerformed(ActionEvent event) {

CreateAccountJButtonActionPerformed(event);

}

}

); // end call to addActionListener

// set up DeleteAccountButton

DeleteAccountJButton = new JButton();

DeleteAccountJButton.setBounds(16, 152, 80, 24);

DeleteAccountJButton.setText("Delete");

inputDetailJPanel.add(DeleteAccountJButton);

DeleteAccountJButton.addActionListener(

new ActionListener() // anonymous inner class

{

// event handler called when DeleteAccountJButton

// is clicked

public void actionPerformed(ActionEvent event) {

DeleteAccountJButtonActionPerformed(event);

}

}

); // end call to addActionListener

// set up TransactionJButton

TransactionJButton = new JButton();

TransactionJButton.setBounds(16, 180, 176, 24);

TransactionJButton.setText("Make Transaction");

inputDetailJPanel.add(TransactionJButton);

TransactionJButton.addActionListener(

new ActionListener() // anonymous inner class

{

// event handler called when TransactionJButton

// is clicked

public void actionPerformed(ActionEvent event) {

TransactionJButtonActionPerformed(event);

}

} // end anonymous inner class

); // end call to addActionListener

// set up DisplayJButton

DisplayJButton = new JButton();

DisplayJButton.setBounds(16, 208, 176, 24);

DisplayJButton.setText("Display Accounts");

inputDetailJPanel.add(DisplayJButton);

DisplayJButton.addActionListener(

new ActionListener() // anonymous inner class

{

// event handler called when TransactionJButton

// is clicked

public void actionPerformed(ActionEvent event) {

DisplayJButtonActionPerformed(event);

}

} // end anonymous inner class

); // end call to addActionListener

// set up displayJLabel

displayJLabel = new JLabel();

displayJLabel.setBounds(240, 16, 150, 23);

displayJLabel.setText("Account Details:");

contentPane.add(displayJLabel);

// set up displayJTextArea

displayJTextArea = new JTextArea();

JScrollPane scrollPane = new JScrollPane(displayJTextArea);

scrollPane.setBounds(240,48,402,184);

scrollPane.setVerticalScrollBarPolicy(ScrollPaneConstants.VERTICAL\_SCROLLBAR\_ALWAYS);

contentPane.add(scrollPane);

displayJTextArea.setText("Welcome to Java Bank - There are currently no Accounts created");

// clear other JTextFields for new data

NameJTextField.setText(" ");

AccountnumJTextField.setText("0");

BalanceJTextField.setText("0");

DepositJTextField.setText("0");

WithdrawJTextField.setText("0");

// set properties of application's window

setTitle("Java Bank"); // set title bar string

setSize(670, 308); // set window size

setVisible(true); // display window

} // end method createUserInterface

private void CreateAccountJButtonActionPerformed(ActionEvent event) {

// System.out.println("Create Account Button Clicked");

displayJTextArea.setText("");

Name = "";

//Get Name from Text Field

Name = NameJTextField.getText();

//Get Accountnum from Text Field and convert to int unless blank then set to 0

if (AccountnumJTextField.getText() == "0") {

Accountnum = 0;

}

else {

Accountnum = Integer.parseInt(AccountnumJTextField.getText());

}

//Get Balance from Text Field and convert to int unless blank then set to 0

if (BalanceJTextField.getText() == "0") {

Balance = 0;

}

else {

Balance = Integer.parseInt(BalanceJTextField.getText());

}

//int emptyAccount = 11;

if ((noAccounts <= 9) & (Name != "") & (Accountnum != 0)) {

myAccounts[noAccounts] = new Account(Name,Accountnum,Balance);

AccountNames[noAccounts] = "USED";

//System.out.println(myAccounts[noAccounts].getaccountname());

//emptyAccount = i;

displayJTextArea.setText(myAccounts[noAccounts].getaccountname() + " " + myAccounts[noAccounts].getaccountnum() + " " + myAccounts[noAccounts].getbalance());

noAccounts ++;

System.out.println(noAccounts);

}

else {

displayJTextArea.setText("Both the Name field and Account Number must be completed");

}

if (noAccounts == 10) {

// Once account 10 is created. All accounts full.

displayJTextArea.setText("All Accounts Full!");

}

// clear other JTextFields for new data

NameJTextField.setText(" ");

AccountnumJTextField.setText("0");

BalanceJTextField.setText("0");

DepositJTextField.setText("0");

WithdrawJTextField.setText("0");

}

private void DeleteAccountJButtonActionPerformed(ActionEvent event) {

displayJTextArea.setText("Oops this isnt coded in this version!");

//Name = NameJTextField.getText();

//System.out.println("Delete Account: " + Name);

// Enter code to delete here

// clear JTextFields for new data

NameJTextField.setText(" ");

AccountnumJTextField.setText("0");

BalanceJTextField.setText("0");

DepositJTextField.setText("0");

WithdrawJTextField.setText("0");

}

private void TransactionJButtonActionPerformed(ActionEvent event) {

displayJTextArea.setText("");

if (noAccounts == 0) {

displayJTextArea.setText("No Accounts currently created");

}else {

// get user input

int Accountnum = Integer.parseInt(AccountnumJTextField.getText());

int Deposit = Integer.parseInt(DepositJTextField.getText());

int Withdraw = Integer.parseInt(WithdrawJTextField.getText());

for (int i=0; i<noAccounts; i++) {

if ((myAccounts[i].getaccountnum() == Accountnum) && (Deposit>0)) {

myAccounts[i].setbalance(myAccounts[i].getbalance()+Deposit);

displayJTextArea.setText(myAccounts[i].getaccountname() + " " + myAccounts[i].getaccountnum() + " " + myAccounts[i].getbalance());

}

if ((myAccounts[i].getaccountnum() == Accountnum) && (Withdraw>0)) {

myAccounts[i].setbalance(myAccounts[i].getbalance()-Withdraw);

displayJTextArea.setText(myAccounts[i].getaccountname() + " " + myAccounts[i].getaccountnum() + " " + myAccounts[i].getbalance());

}

}

}

// clear other JTextFields for new data

NameJTextField.setText(" ");

AccountnumJTextField.setText("0");

BalanceJTextField.setText("0");

DepositJTextField.setText("0");

WithdrawJTextField.setText("0");

}

private void DisplayJButtonActionPerformed(ActionEvent event) {

Name = NameJTextField.getText();

displayJTextArea.setText("");

if (noAccounts == 0) {

displayJTextArea.setText("No Accounts currently created");

}else {

for (int i=0; i<noAccounts; i++) {

displayJTextArea.append(myAccounts[i].getaccountname() + " " + myAccounts[i].getaccountnum() + " " + myAccounts[i].getbalance() + "\n");

}

}

// clear other JTextFields for new data

NameJTextField.setText(" ");

AccountnumJTextField.setText("0");

BalanceJTextField.setText("0");

DepositJTextField.setText("0");

WithdrawJTextField.setText("0");

}

public static void main(String[] args) {

// Populate arrays with the word EMPTY

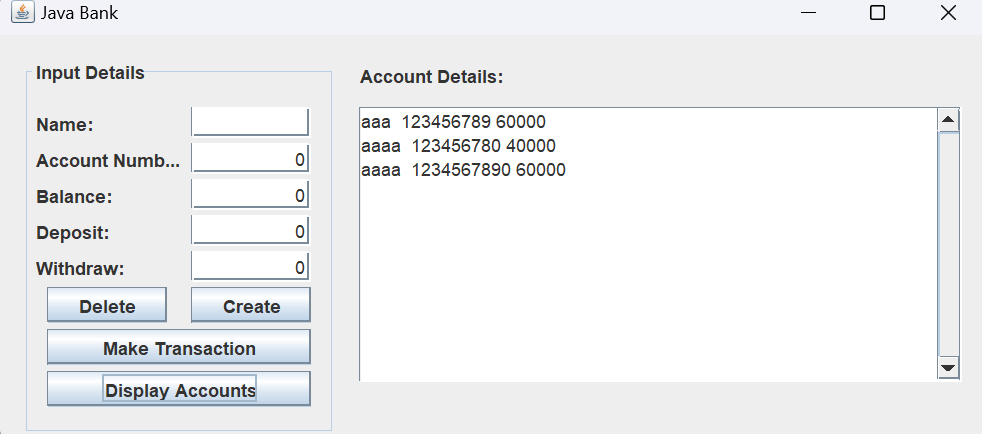
// so we can check to see if the values are empty later

JavaBank application = new JavaBank();

application.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

}

}



***BIKE CODE:***

package bikeproject;

public class MountainBike extends Bike{

private String suspension, type;

private int frameSize;

public MountainBike()

{

this("Bull Horn", "Hardtail", "Maxxis", "dropper", 27, "RockShox XC32", "Pro", 19);

}//end constructor

public MountainBike(String handleBars, String frame, String tyres, String seatType, int numGears,

String suspension, String type, int frameSize) {

super(handleBars, frame, tyres, seatType, numGears);

this.suspension = suspension;

this.type = type;

this.frameSize = frameSize;

}//end constructor

public void printDescription()

{

super.printDescription();

System.*out*.println("This mountain bike is a " + this.type + " bike and has a " + this.suspension + " suspension and a frame size of " + this.frameSize + "inches.");

}//end method printDescription

}//end class MountainBike

---

package bikeproject;

public class BikeDriver {

public static void main(String[] args) {

RoadBike bike1 = new RoadBike();

RoadBike bike2 = new RoadBike("drop", "tourer", "semi-grip", "comfort", 14, 25, 18);

MountainBike bike3 = new MountainBike();

Bike bike4 = new Bike();

bike1.printDescription();

bike2.printDescription();

bike3.printDescription();

bike4.printDescription();

}//end method main

}//end class BikeDriver

----

package bikeproject;

public class MountainBike extends Bike{

private String suspension, type;

private int frameSize;

public MountainBike()

{

this("Bull Horn", "Hardtail", "Maxxis", "dropper", 27, "RockShox XC32", "Pro", 19);

}//end constructor

public MountainBike(String handleBars, String frame, String tyres, String seatType, int numGears,

String suspension, String type, int frameSize) {

super(handleBars, frame, tyres, seatType, numGears);

this.suspension = suspension;

this.type = type;

this.frameSize = frameSize;

}//end constructor

public void printDescription()

{

super.printDescription();

System.*out*.println("This mountain bike is a " + this.type + " bike and has a " + this.suspension + " suspension and a frame size of " + this.frameSize + "inches.");

}//end method printDescription

}//end class MountainBike

----

spackage bikeproject;

public class RoadBike extends Bike{

private int tyreWidth, postHeight;

public RoadBike()

{

this("drop", "racing", "tread less", "razor", 19, 20, 22);

}//end constructor

public RoadBike(int postHeight)

{

this("drop", "racing", "tread less", "razor", 19, 20, postHeight);

}//end constructor

public RoadBike(String handleBars, String frame, String tyres, String seatType, int numGears,

int tyreWidth, int postHeight) {

super(handleBars, frame, tyres, seatType, numGears);

this.tyreWidth = tyreWidth;

this.postHeight = postHeight;

}//end constructor

public void printDescription()

{

super.printDescription();

System.*out*.println("This Roadbike bike has " + this.tyreWidth + "mm tyres and a post height of " + this.postHeight + ".");

}//end method printDescription

}//end class RoadBike

---

A screenshot of a computer

Description automatically generated

***CALCULATOR:***

import java.awt.Container;

import javax.swing.JFrame;

import javax.swing.JPanel;

import calculator.CalcPanel;

public class CalcMain {

public static void main(String[] args) {

JFrame theGUI = new JFrame();

theGUI.setTitle("My Calculator");

theGUI.setSize(220,350);

theGUI.setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

Container pane = theGUI.getContentPane();

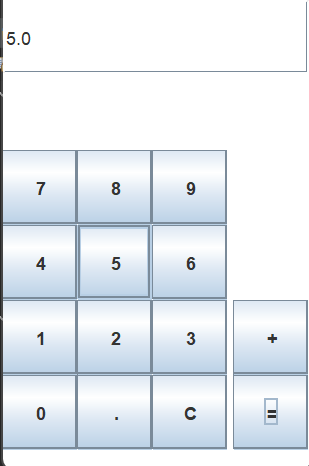
JPanel myPanel = new CalcPanel();

pane.add(myPanel);

theGUI.setVisible(true);

}

}



package calculator;

import javax.swing.\*;

import java.awt.Color;

import java.awt.event.\*;

public class CalcPanel extends JPanel implements ActionListener {

String num1="";

String num2="";

String operator="";

boolean usingFirst=true;

double total=0;

JTextField display;

JButton b1;

JButton b2;

JButton b3;

JButton b4;

JButton b5;

JButton b6;

JButton b7;

JButton b8;

JButton b9;

JButton b0;

JButton bdec;

JButton bclear;

JButton bequals;

JButton bplus;

public CalcPanel()

{

this.setBackground(Color.white);

setLayout(null);

display=new JTextField();

b1=new JButton("1");

b2=new JButton("2");

b3=new JButton("3");

b4=new JButton("4");

b5=new JButton("5");

b6=new JButton("6");

b7=new JButton("7");

b8=new JButton("8");

b9=new JButton("9");

b0=new JButton("0");

bdec=new JButton(".");

bclear=new JButton("C");

bequals = new JButton( "=");

bplus=new JButton("+");

display.setBounds(0,0,205,50);

b1.setBounds(0,200,50,50);

b2.setBounds(50,200,50,50);

b3.setBounds(100,200,50,50);

bplus.setBounds(154,200,50,50);

b4.setBounds(0,150,50,50);

b5.setBounds(50,150,50,50);

b6.setBounds(100,150,50,50);

b7.setBounds(0,100,50,50);

b8.setBounds(50,100,50,50);

b9.setBounds(100,100,50,50);

b0.setBounds(0,250,50,50);

bdec.setBounds(50,250,50,50);

bclear.setBounds(100,250,50,50);

bequals.setBounds(154,250,50,50);

add(b1);

add(b2);

add(b3);

add(b4);

add(b5);

add(b6);

add(b7);

add(b8);

add(b9);

add(b0);

add(bdec);

add(display);

add(bclear);

add(bequals);

add(bplus);

b1.addActionListener(this);

b2.addActionListener(this);

b3.addActionListener(this);

b4.addActionListener(this);

b5.addActionListener(this);

b6.addActionListener(this);

b7.addActionListener(this);

b8.addActionListener(this);

b9.addActionListener(this);

b0.addActionListener(this);

bequals.addActionListener(this);

bplus.addActionListener(this);

bclear.addActionListener(this);

bdec.addActionListener(this);

}

public void actionPerformed(ActionEvent e){

String s=e.getActionCommand();

if(s.equals("1")||s.equals("2")||s.equals("3")||s.equals("4")||

s.equals("5")||s.equals("6")||s.equals("7")||s.equals("8")||

s.equals("9")||s.equals("0")||s.equals("."))

{

if(usingFirst)

{

num1=num1+s;

display.setText(num1);

}

else

{

num2=num2+s;

display.setText(num2);

}

}

if(s.equals("+"))

{

usingFirst=false;

operator="+";

}

if(s.equals("="))

{

switch(operator){

case "+":

total=Double.parseDouble(num1)+Double.parseDouble(num2);

display.setText( ""+total );

break;

}

usingFirst=true;

num1="";

num2="";

operator="";

}

if(s.equals("C"))

{

display.setText( "" );

usingFirst=true;

num1="";

num2="";

total=0;

}

}

}

