Java Programming

Section 2-1 practice:

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
```

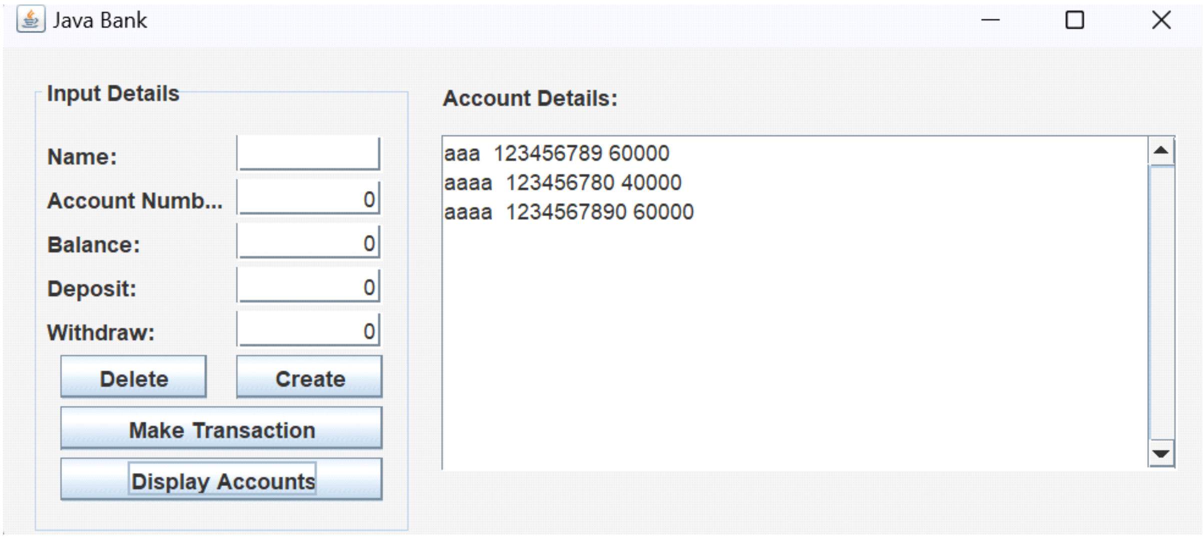
```
            // is clicked
            public void actionPerformed(ActionEvent event) {
               DisplayJButtonActionPerformed(event);
            }

         } // 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);
     }
}
```



Name:
Account Numb... 0
Balance: 0
Deposit: 0
Withdraw: 0

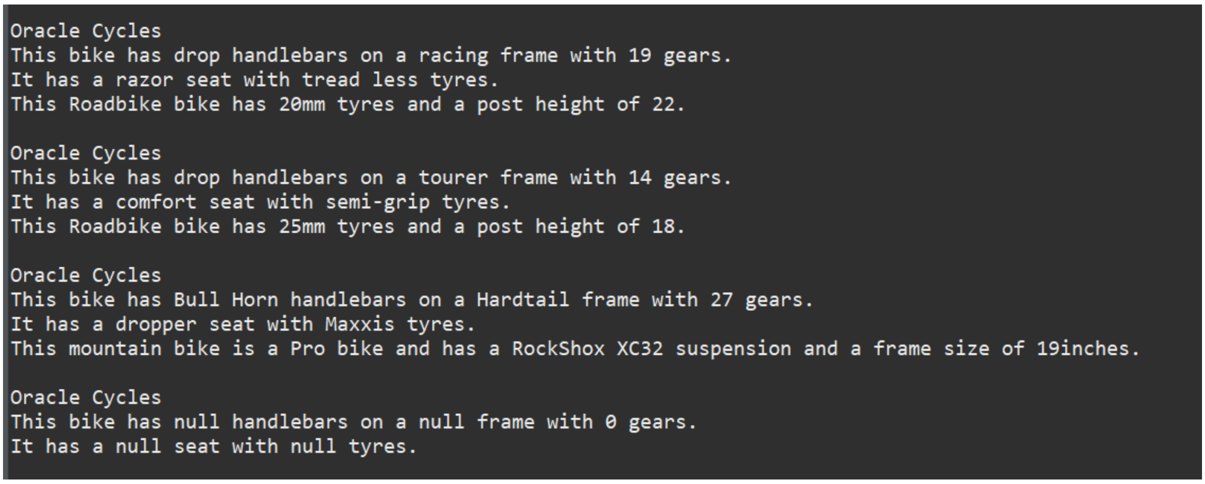
```
aaa  123456789 60000
aaaa  123456780 40000
aaaa  1234567890 60000
```

BIKE:

```
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) {
```

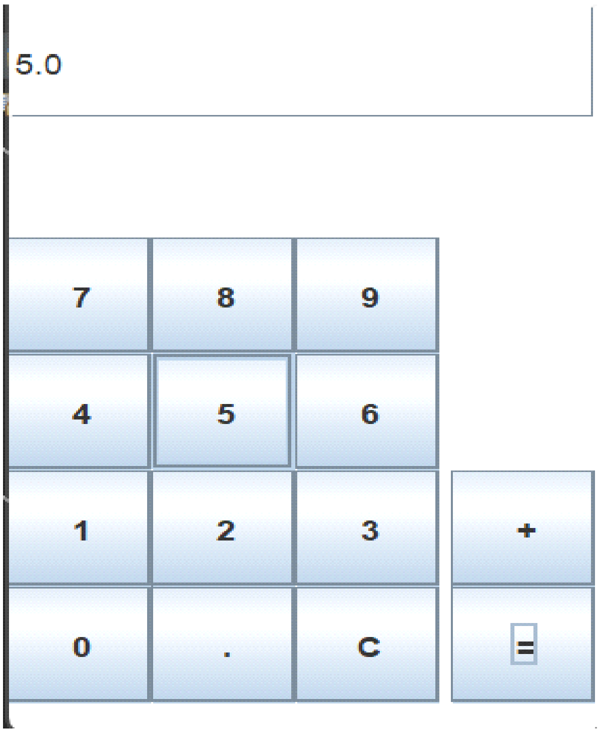
```
        super(handleBars, frame, tyres, seatType, numGears);
        this.suspension = suspension;
        this.type = type;
        this.frameSize = frameSize;
    }//end constructor

    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
```



```
Oracle Cycles
This bike has drop handlebars on a racing frame with 19 gears.
It has a razor seat with tread less tyres.
This Roadbike bike has 20mm tyres and a post height of 22.

Oracle Cycles
This bike has drop handlebars on a tourer frame with 14 gears.
It has a comfort seat with semi-grip tyres.
This Roadbike bike has 25mm tyres and a post height of 18.

Oracle Cycles
This bike has Bull Horn handlebars on a Hardtail frame with 27 gears.
It has a dropper seat with Maxxis tyres.
This mountain bike is a Pro bike and has a RockShox XC32 suspension and a frame size of 19inches.

Oracle Cycles
This bike has null handlebars on a null frame with 0 gears.
It has a null seat with null tyres.
```

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);
        }
}
```



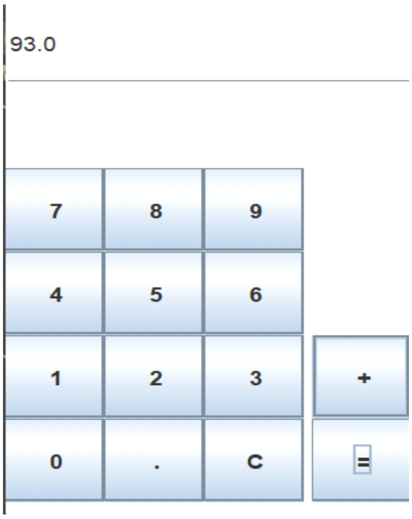
```
package calculator;
import javax.swing.*;
import java.awt.Color;
import java.awt.event.*;

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;
                }
        }
}
```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