**GUI17 Coin Flip**

**Directions**

In the previous lesson you saw how to create a textarea using the JTextArea class. The program used to demonstrate the textarea had one major limitation. There were no scrollbars. In this lesson we look at how you go about adding scroll bars to a textarea. The program below displays the numbers from 1 to 5000 within the textarea. A vertical scrollbar has been added so you can scroll back to see all of the numbers.

Copy the following code into your source file. Compile and run the program.

import java.util.\*;

import java.awt.\*;

import javax.swing.\*;

import java.awt.event.\*;

public class GUI17 extends JFrame implements ActionListener

{

// instance variables

private JButton button;

private JTextArea textArea;

private JScrollPane scrollpane;

// constructor

public GUI17()

{

// create button

button = new JButton("run");

// set button attributes

button.setLocation(220,20);

button.setSize(80, 25);

// add button to frame

getContentPane().add(button);

// register listener with button

button.addActionListener(this);

// create textarea

textArea = new JTextArea();

// set textarea attributes

textArea.setFont(new Font("Arial", Font.PLAIN, 16));

textArea.setEditable(false); // cannot type text into textArea

textArea.setLineWrap(true);

// wrap text when reach right border

// create scrollpane and add textarea

scrollpane = new JScrollPane(textArea);

// set scrollpane attributes

scrollpane.setLocation(50,50);

scrollpane.setSize(400, 400);

scrollpane.setBorder(BorderFactory.createLineBorder (Color.blue, 2));

// add scrollpane to frame

getContentPane().add(scrollpane);

// set frame attributes

setLayout(null);

setSize(500, 500);

setDefaultCloseOperation(JFrame.EXIT\_ON\_CLOSE);

setVisible(true);

}

public void actionPerformed(ActionEvent event)

{

if(event.getSource() == button) // identify source

{

String text = "";

for(int i = 1; i <= 5000; i++)

{

text += i + " ";

}

textArea.setText(""); // clear text area

textArea.append(text); // append text to text area

}

}

// main method

public static void main(String[] args)

{

GUI17 app = new GUI17(); // run program

}

}

The first line of code is a textarea attribute that turns on line wrapping so that when the text reaches the right boundary of the textarea window the text is wrapped so that its starts at the beginning of the next line. If this line is omitted or set to false a horizontal scrollbar will appear if the text goes beyond the right boundary of the textarea.

textArea.setLineWrap(true); // wrap text when reach right border of textarea

The class **JScrollPane** is used to add scrollbars to textareas. Notice that when creating the JScrollPane object you pass the textarea as a parameter.

**Important:** When using a scrollpane with a textarea you do not add the textarea to the content pane. Instead you add it to the scrollpane. Instead it is the scrollpane that is added to the content pane of the frame.

scrollpane = new JScrollPane(textArea);

The location,size, and border attributes are set for the scrollpane not the textarea.

scrollpane.setLocation(50,50);

scrollpane.setSize(400, 400);

scrollpane.setBorder(BorderFactory.createLineBorder (Color.blue, 2));

**Modifications**

Modify the **actionPerformed** method so that the program simulates the flipping of a coin.

1. The program should generate 500 random numbers in the range of 0 - 1.
2. Let 0 represent heads and 1 represent tails.
3. The textarea should display the words "heads" or "tails" 500 times simulating 500 flips of a coin.
4. Below the list of heads or tails the textarea should display the count of the number of heads and tails flipped.
5. The textarea should also display the percentage of heads and tails thrown using the following formula:  
     
   **percentage = number thrown divided by 500 multiplied by 100.**
6. To cause each line to be displayed on a separate line you will need to use the new line escape sequence (\n). Example:  
     
   **text += " heads\n";**

**Source File**

GUI17.java

**Sample Run**

