Visual Programming – Tutorial Week 5 – Source Code

Please Note: This document can be printed but not copied to Windows' Clipboard. The reason for this is that CQU wants students who need the solutions to type in the code – rather than copy and paste it – to aid in your understanding of the material covered.

Please Note: Only look at the solutions when you have made good attempts at the questions - otherwise you will NOT learn!

Exercise 1 – the Java console application using Swing components

/*
   Name:                Gross Pay Calculator
   Programmer:         Tony Dobele
   Filename:           GrossPayCalcSwing.java
   Purpose:            This program calculates an employee's weekly gross pay,
                        using total hours worked and hourly pay rate (input by the user).
*/

import javax.swing.JOptionPane;
import java.text.DecimalFormat;

public class GrossPayCalcSwing
{

    public static void main(String[] args)
    {
        // declare and construct variables

        int option;
        double hours, rate, grossPay, overtime;
        double normalHours = 36.5;
        boolean done = false, input = false;
        while (!done)
        {

            // reset variables, print prompts and get input

            hours = rate = grossPay = overtime = 0.0;
            input = false;

            System.out.println("tGROSS PAY CALCULATOR");
            System.out.println();
String empID=JOptionPane.showInputDialog(null,"Enter the Employee number ");

while(!input)
{
    try
    {
        String hoursWorked=JOptionPane.showInputDialog(null,"Enter the hours worked (1 to 80 )");
        hours = Double.parseDouble(hoursWorked);
        if (hours < 1 || hours > 80) throw new NumberFormatException();
        else input = true;
    }
    catch(NumberFormatException e)
    {
        JOptionPane.showMessageDialog(null,"Please enter a value between 1 and 80 ", "Error", JOptionPane.INFORMATION_MESSAGE);
    }
} // end while 1

input = false;

while(!input)
{
    try
    {
        String payRate=JOptionPane.showInputDialog(null,"Enter the hourly rate - ($1 to $100 )");
        rate = Double.parseDouble(payRate);
        if (rate < 1 || rate > 100) throw new NumberFormatException();
        else input = true;
    }
    catch(NumberFormatException e)
    {
        JOptionPane.showMessageDialog(null,"Please enter a value between $1 and $100", "Error", JOptionPane.INFORMATION_MESSAGE);
    }
} // end while 2

// calculations

if(hours <= normalHours)
{
    grossPay = hours * rate;
}
else
{
grossPay = normalHours * rate;
overtime = (hours - 36.5) * rate * 1.5;
grossPay += overtime;
}

// output

DecimalFormat twoDigits = new DecimalFormat("$#,###.00");
JOptionPane.showMessageDialog(null, empID + ", YOUR GROSS PAY IS"
+ twoDigits.format(grossPay) + " FOR THIS WEEK", "Loan Repayment
Calculator", JOptionPane.PLAIN_MESSAGE);

option = JOptionPane.showConfirmDialog(null, "Calculate another pay?", "Confirm box", JOptionPane.YES_NO_OPTION);

if (option == 1)
{
   done = true;
}

} //end while1

System.exit(0);

} //end main()
} //end class
There will be quite a bit of repeated code in the try and catch blocks. See if you can code just one try and catch in a separate method. Then the method can be called each time input needs to be verified.

/*
 Name:   Gross Pay Calculator
 Programmer: Tony Dobele
 Filename:  GrossPayCalcSwingV2.java
 Purpose:   This program calculates an employee's weekly gross pay, 
            using total hours worked and hourly pay rate (input by the user).
 */

import javax.swing.JOptionPane;
import java.text.DecimalFormat;

public class GrossPayCalcSwingV2
{
    public static void main(String[] args)
    {
        // declare and construct variables
        int option;
        double hours = 0.0, rate = 0.0, grossPay = 0.0, overtime = 0.0;
        double normalHours = 36.5;
        boolean done = false, input = false;

        System.out.println("GROSS PAY CALCULATOR");
        System.out.println();

        while (!done)
        {
            // print prompts and get inputs
            hours = getInput (1, 80, "Enter the hours worked - (1 to 80)");
            rate = getInput(1, 100, "Enter the hourly rate - (1 to 100”);

            // calculations
            if(hours <= normalHours)
            {
                grossPay = hours * rate;
            }
            else
            {
                grossPay = normalHours * rate;
                overtime = (hours - 36.5) * rate * 1.5;
            }
        }
    }
}
grossPay += overtime;

// output

DecimalFormat twoDigits = new DecimalFormat("$#,###.00");
JOptionPane.showMessageDialog(null,"YOUR GROSS PAY IS "+
twoDigits.format(grossPay) + " FOR THE WEEK", "Gross Pay Calculator",
JOptionPane.PLAIN_MESSAGE);

option = JOptionPane.showConfirmDialog(null,"Calculate another pay?",
"Confirm box", JOptionPane.YES_NO_OPTION);
if (option == 1)
{
    done = true;
}

} //end while
System.exit(0);

} // end main()

public static double getInput(double min, double max, String prompt)
{
    boolean done = false;
    double input = 0.0;

    while(!done)
    {
        try
        {
            String inputValue = JOptionPane.showInputDialog(null, prompt);
            input = Double.parseDouble(inputValue);
            if (input < min || input > max)throw new NumberFormatException();
            else done = true;
        }
        catch(NumberFormatException e)
        {
            JOptionPane.showMessageDialog(null, "That is not a valid entry 
Please try again",  
"Error", JOptionPane.INFORMATION_MESSAGE);
        }
    } // end while
return input;
} // end getInput()

} // end class
Exercise 2 – the Java applet

/*
Name:   Gross Pay Calculator
Programmer: Tony Dobele
Filename:  GrossPayApplet.java
Purpose:   This program calculates an employee's weekly gross pay,
            using total hours worked and hourly pay rate (input by the user).
*/

import java.awt.*;
import java.applet.*;
import java.awt.event.*;
import java.text.DecimalFormat;

public class GrossPayApplet extends Applet implements ActionListener
{
    //declare variables and construct a colour
    double hours, rate, grossPay, overtime, normalHours;

    Image logo;

    //Create components for applet
    Label titleLabel = new Label("GROSS PAY CALCULATOR");
    Label hoursLabel = new Label("Enter the hours worked");
        TextField hoursField = new TextField(10);
    Label rateLabel = new Label("Enter the hourly rate");
        TextField rateField = new TextField(10);
    Button calcButton = new Button("Calculate");
    Label outputLabel = new Label("Click the Calculate button to see your gross
        pay");

    public void init()
    {
        normalHours = 36.5;

        setForeground(Color.red);

        add(titleLabel);
        add(hoursLabel);
        add(hoursField);
        hoursField.requestFocus();
        add(rateLabel);
        add(rateField);
        rateField.requestFocus();
        add(calcButton);
        add(outputLabel);
    
    public void actionPerformed(ActionEvent event)
    {  
        hours = Double.parseDouble(hoursField.getText());
        rate = Double.parseDouble(rateField.getText());

        grossPay = hours * rate;
        overtime = (hours - normalHours) * rate;

        outputLabel.setText("Your gross pay is: 
            \$" + new DecimalFormat("##.00").format(grossPay) + "\n            \$" + new DecimalFormat("##.00").format(overtime));
    
    }
}

add(rateField);

add(calcButton);
calcButton.addActionListener(this);

add(outputLabel);

logo = getImage(getDocumentBase(), "logo.gif");
}//end init()

public void actionPerformed(ActionEvent e)
{
    boolean flag = true;
    DecimalFormat twoDigits = new DecimalFormat("$#,###.00");

    try
    {
        hours = Double.parseDouble(hoursField.getText());
        if (hours < 0 || hours > 80) throw new NumberFormatException();
    }
    catch(NumberFormatException a)
    {
        flag = false;
    }

    try
    {
        rate = Double.parseDouble(rateField.getText());
        if (rate < 1 || rate > 100) throw new NumberFormatException();
    }
    catch(NumberFormatException c)
    {
        flag = false;
    }

    if (flag) // flag is still true only if hours and rate are both valid
    {
        if(hours <= normalHours)
        {
            grossPay = hours * rate;
        }
        else
        {
            grossPay = normalHours * rate;
            overtime = (hours - 36.5) * rate * 1.5;
            grossPay += overtime;
        }
    }
outputLabel.setText("YOUR GROSS PAY IS " +
twoDigits.format(grossPay) + " FOR THE WEEK");
} // end if

else
{
    outputLabel.setText("ONE OR BOTH DATA VALUES INVALID");
}

} // end actionPerformed()

public void paint (Graphics g)
{
    g.drawImage(logo,125,160,this);
} // end paint()

} // end class