```java
/**********************************************************************
 *
 * File:        MyJavaCoffeeOutletGUI.java
 *
 * Author:      Dan Gerstl
 *
 * Date:        04/29/2018
 *
 * Purpose:     Project 1
 *
 * Description: GUI interface to obtain user information and order amount
 *              and generate an invoice with provided information.
 *
 * Comment:     NA
 *
 **********************************************************************/

import java.util.*;
import java.lang.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class MyJavaCoffeeOutletGUI implements ActionListener
{
    /*** Class Variables ***/

    JButton jbuCreateInvoice = null;
    JButton jbuClear         = null;
    JButton jbuPrint         = null;
    JButton jbuExit          = null;

    JTextField jteFirstName     = null;
    JTextField jteLastName      = null;
    JTextField jteStreetAddress = null;
    JTextField jteCity          = null;
    JTextField jteZipCode       = null;
    JTextField jteBagsToOrder   = null;

    JComboBox<String> jcoState = null;

    JTextArea jtaInvoice = null;

    public MyJavaCoffeeOutletGUI(String title)
    {
        /*** Local Variables ***/

        JFrame jfrCoffeeOutlet = null;
        Container c = null;

        /*** Instantiate Objects ***/

        jfrCoffeeOutlet = new JFrame(title);

        /*** Get JFrame address ***/

        c = jfrCoffeeOutlet.getContentPane();

        /*** Set attributes for containers ***/

        setJFrameAttributes(jfrCoffeeOutlet);
        c.setBackground(Color.lightGray);

        /*** Build GUI ***/
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        buildGUI(c);
    }

    /*** GUI Methods ***/

    private void setJFrameAttributes(JFrame myGUI)
    {
        /*** Set Size ***/

        myGUI.setSize(510, 575);

        /*** Set Colors ***/

        myGUI.setBackground(Color.lightGray);

        /*** Set Layout ***/

        myGUI.setLayout(new GridBagLayout());

        myGUI.setVisible(true);
    }

    private void buildGUI(Container c)
    {
        /*** Local Variables ***/

        JPanel jpaName    = null;
        JPanel jpaAddress = null;
        JPanel jpaOrder   = null;
        JPanel jpaButtons = null;
        JPanel jpaInvoice = null;

        GridBagConstraints constraints = null;

        /*** Instantiate Components ***/

        jpaName    = createNamePanel();
        jpaAddress = createAddressPanel();
        jpaOrder   = createOrderPanel();
        jpaButtons = createButtonsPanel();
        jpaInvoice = createInvoicePanel();

        constraints = new GridBagConstraints();

        /*** Set Constraints ***/

        constraints.insets  = new Insets(2,5,2,5);
        constraints.anchor  = GridBagConstraints.FIRST_LINE_START;
        constraints.fill    = GridBagConstraints.BOTH;
        constraints.gridx   = 0;
        constraints.gridy   = 0;
        constraints.weightx = 0.5;
        constraints.weighty = 0.0;

        /*** Add Containers ***/

        c.add(jpaName, constraints);

        constraints.insets  = new Insets(0,0,0,0);
        constraints.gridy = 1;
        c.add(jpaAddress, constraints);

        constraints.gridy = 2;
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        c.add(jpaOrder, constraints);

        constraints.gridy = 3;
        c.add(jpaButtons, constraints);

        constraints.gridy = 4;
        constraints.weighty = 1.0;
        c.add(jpaInvoice, constraints);
    }

    private JPanel createNamePanel()
    {
        /*** Local Variables ***/

        JPanel jpaName = null;

        JLabel jlaCustomerName = null;
        JLabel jlaSpacer       = null;
        JLabel jlaFirstName    = null;
        JLabel jlaLastName     = null;

        /*** Instantiate Container ***/

        jpaName = new JPanel();

        /*** Set Attributes ***/

        jpaName.setBackground(Color.lightGray);
        jpaName.setLayout(new GridLayout(0, 2, 5, 0));

        /*** Instantiate Components ***/

        jlaCustomerName = new JLabel("Customer name: ");

        jlaSpacer       = new JLabel("");

        jlaFirstName    = new JLabel("First name");
        jteFirstName    = new JTextField(20);

        jlaLastName     = new JLabel("Last name");
        jteLastName     = new JTextField(20);

        /*** Add components to container ***/

        jpaName.add(jlaCustomerName);
        jpaName.add(jlaSpacer);

        jpaName.add(jteFirstName);
        jpaName.add(jteLastName);

        jpaName.add(jlaFirstName);
        jpaName.add(jlaLastName);

        return jpaName;
    }

    private JPanel createAddressPanel()
    {
        /*** Local Constants ***/

        final String[] STATES = {"", "AL", "AK", "AZ", "AR", "CA", "CO",
                                 "CT", "DE", "FL", "GA", "HI", "ID", "IL",
                                 "IN", "IA", "KS", "KY", "LA", "ME", "MD",
                                 "MA", "MI", "MN", "MS", "MO", "MT", "NE",
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                                     "NV", "NH", "NJ", "NM", "NY", "NC", "ND",
                                     "OH", "OK", "OR", "PA", "RI", "SC", "SD",
                                     "TN", "TX", "UT", "VT", "VA", "WA", "WV",
                                     "WI", "WY"};

        /*** Local Variables ***/

        JPanel jpaAddress  = null;

        JLabel jlaShippingAddress = null;
        JLabel jlaStreetAddress   = null;
        JLabel jlaCity            = null;
        JLabel jlaState           = null;
        JLabel jlaZipCode         = null;
        JLabel jlaBagsOrdered     = null;

        GridBagConstraints constraints = null;

        /*** Instantiate Container ***/

        jpaAddress = new JPanel();

        /*** Set Container Attributes ***/

        jpaAddress.setBackground(Color.lightGray);
        jpaAddress.setLayout(new GridBagLayout());

        /*** Instantiate Components ***/

        constraints = new GridBagConstraints();

        jlaShippingAddress = new JLabel("Shipping Address: ");

        jlaStreetAddress = new JLabel("Street Address");
        jteStreetAddress = new JTextField(20);

        jlaCity = new JLabel("City");
        jteCity = new JTextField(20);

        jlaState = new JLabel("State");

        jcoState = new JComboBox<>(STATES);
        jcoState.setEditable(false);

        jlaZipCode = new JLabel("Zip code");
        jteZipCode = new JTextField(10);

        /*** Set component attributes and add to container ***/

        constraints.insets  = new Insets(2,5,2,5);
        constraints.anchor  = GridBagConstraints.FIRST_LINE_START;
        constraints.fill    = GridBagConstraints.HORIZONTAL;
        constraints.gridx   = 0;
        constraints.gridy   = 0;
        constraints.weightx = 0.5;
        constraints.weighty = 0.5;
        jpaAddress.add(jlaShippingAddress, constraints);

        constraints.gridx     = 0;
        constraints.gridy     = 1;
        constraints.gridwidth = GridBagConstraints.REMAINDER;
        jpaAddress.add(jteStreetAddress, constraints);

        constraints.gridx = 0;
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        constraints.gridy = 2;
        jpaAddress.add(jlaStreetAddress, constraints);

        constraints.gridwidth = 1;
        constraints.gridx = 0;
        constraints.gridy = 3;
        jpaAddress.add(jteCity, constraints);

        constraints.gridx = 1;
        constraints.gridy = 3;
        jpaAddress.add(jcoState, constraints);

        constraints.gridx = 2;
        constraints.gridy = 3;
        jpaAddress.add(jteZipCode, constraints);

        constraints.gridx = 0;
        constraints.gridy = 4;
        jpaAddress.add(jlaCity, constraints);

        constraints.gridx = 1;
        constraints.gridy = 4;
        jpaAddress.add(jlaState, constraints);

        constraints.gridx = 2;
        constraints.gridy = 4;
        jpaAddress.add(jlaZipCode, constraints);

        return jpaAddress;
    }

    private JPanel createOrderPanel()
    {
        /*** Local Variables ***/

        JPanel jpaOrder          = null;

        JLabel jlaBagsToOrder     = null;

        /*** Instantiate Container ***/

        jpaOrder = new JPanel();

        /*** Instantiate Components ***/

        jlaBagsToOrder = new JLabel("Number of bags to order: ");

        jteBagsToOrder = new JTextField(9);

        /*** Set Attributes ***/

        jpaOrder.setBackground(Color.lightGray);
        jpaOrder.setLayout(new FlowLayout());

        /*** Add components to container ***/

        jpaOrder.add(jlaBagsToOrder);
        jpaOrder.add(jteBagsToOrder);

        return jpaOrder;
    }

    private JPanel createButtonsPanel()
    {
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        /*** Local Variables ***/

        JPanel jpaButtons = null;

        /*** Instantiate Container ***/

        jpaButtons = new JPanel();

        /*** Instantiate Components ***/

        jbuCreateInvoice = new JButton("Create Invoice");
        jbuCreateInvoice.addActionListener(this);

        jbuClear = new JButton("Clear Form");
        jbuClear.addActionListener(this);

        jbuPrint = new JButton("Print");
        jbuPrint.addActionListener(this);

        jbuExit = new JButton("Exit");
        jbuExit.addActionListener(this);

        /*** Set Attributes ***/

        jpaButtons.setBackground(Color.lightGray);
        jpaButtons.setLayout(new GridLayout(1, 4, 5, 0));

        /*** Add components to container ***/

        jpaButtons.add(jbuCreateInvoice);
        jpaButtons.add(jbuClear);
        jpaButtons.add(jbuPrint);
        jpaButtons.add(jbuExit);

        return jpaButtons;
    }

    private JPanel createInvoicePanel()
    {
        /*** Local Variables ***/

        JPanel jpaInvoice = null;

        /*** Instantiate Container ***/

        jpaInvoice = new JPanel();

        /*** Instantiate Components ***/

        jtaInvoice = new JTextArea(18,60);

        /*** Set Attributes ***/

        jpaInvoice.setBackground(Color.lightGray);

        jtaInvoice.setEditable(false);
        jtaInvoice.setFont(new Font("Courier New", Font.PLAIN, 12));

        /*** Add components to container ***/

        jpaInvoice.add(jtaInvoice);

        return jpaInvoice;
    }
```

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/*** Action Event ***/

public void actionPerformed( ActionEvent e)
{
    /*** Local Variables ***/

    int bags = 0;

    String strBags   = null;
    String firstName = null;
    String lastName  = null;
    String address   = null;
    String city      = null;
    String state     = null;
    String zipCode   = null;

    /*** Exit or Clear ***/

    if (e.getSource() == jbuExit)
    {
        System.exit(0);
    }

    else if (e.getSource() == jbuClear)
    {
        resetForm();
    }

    /*** Get user input ***/

    strBags   = jteBagsToOrder.getText().trim();
    firstName = jteFirstName.getText().trim();
    lastName  = jteLastName.getText().trim();
    address   = jteStreetAddress.getText().trim();
    city      = jteCity.getText().trim();
    state     = jcoState.getSelectedItem().toString();
    zipCode   = jteZipCode.getText().trim();

    /*** Remove any additional spaces ***/

    strBags   = removeExtraSpaces(strBags);
    firstName = removeExtraSpaces(firstName);
    lastName  = removeExtraSpaces(lastName);
    address   = removeExtraSpaces(address);
    city      = removeExtraSpaces(city);
    zipCode   = removeExtraSpaces(zipCode);

    /*** Return trimmed text ***/

    jteBagsToOrder.setText(strBags);
    jteFirstName.setText(firstName);
    jteLastName.setText(lastName);
    jteStreetAddress.setText(address);
    jteCity.setText(city);
    jteZipCode.setText(zipCode);

    /*** Verify Input ***/

    if (verifyInput(strBags, zipCode))
    {
        /*** Get integer value ***/

        bags = Integer.parseInt(strBags);
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        /*** Instantiate Objects ***/

         OrderCost order = new OrderCost(bags);
         ClientInformation client = new ClientInformation(firstName,
                                        lastName, address, city,
                                        state, zipCode);
         /*** Calculate costs ***/

         order.calculateTotal();

        /*** Create Invoice ***/

        if (e.getSource() == jbuCreateInvoice)
        {
             /*** Clear Output ***/

             clearOutput();

             /*** Display Invoice ***/

             jtaInvoice.setText(Invoice.createInvoice(client, order));
        }

         else if (e.getSource() == jbuPrint)
         {
             /*** Clear Output ***/

             clearOutput();

             /*** Print to console ***/

             System.out.println(Invoice.createInvoice(client,order));
        }
     }
     else
     {
         jtaInvoice.setText(" Please verify zip code and bags ordered.");
     }
   }

   /*** Action event helper methods ***/

   private void resetForm()
   {
       /*** Clear Input ***/

       clearInput();

       /*** Clear Output ***/

       clearOutput();

   }

   private void clearInput()
   {
       jteFirstName.setText("");
       jteLastName.setText("");
       jteStreetAddress.setText("");
       jteCity.setText("");
       jteZipCode.setText("");
       jteBagsToOrder.setText("");
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        jcoState.setSelectedIndex(0);
    }

    private void clearOutput()
    {
        jtaInvoice.setText("");
    }

    /*** Validation Methods ***/

    private boolean verifyInput(String bags, String zipCode)
    {
        /*** Local Variables ***/

        boolean isValid = false;

        if (verifyIsNumber(bags))
        {
            if(ClientInformation.verifyZipCode(zipCode))
            {
                isValid = true;
            }
        }

        return isValid;
    }

    private boolean verifyIsNumber(String input)
    {
        /*** Local Variables ***/

        boolean isNumber = true;

        int counter = 0;

        while (isNumber == true && counter < input.length())
        {
            if (!Character.isDigit(input.charAt(counter)))
            {
                isNumber = false;
            }
            counter++;
        }

        return isNumber;
    }

    private String removeExtraSpaces(String input)
    {
        /*** Local Variables ***/

        String output = input;

        while (output.indexOf("  ") != -1)
        {
            output = output.replace("  ", " ");
        }

        return output;
    }

    /*** Application ***/

    public static void main(String[] args)
```

```
        {
            new MyJavaCoffeeOutletGUI("MyJava Coffee Outlet");
        }
    }
```