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Лабораторная работа №6
«Программа с графическим пользовательским интерфейсом»
по курсу: «Языки и методы программирования»

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Приобретение навыков разработки программ с графическим пользовательским интерфейсом на основе библиотеки swing.

Задачи

«Домик» с двускатной крышей, у которого n этажей, а на каждом этаже по m окон. Печное отопление – по желанию пользователя.

Решение

Исходный код

PictureForm.java

```
import javax.swing.*.*;
import javax.swing.event.ChangeEvent;
import javax.swing.event.ChangeListener;

public class PictureForm {
    private JPanel mainPanel;
    private JSpinner floorSpinner;
    private CanvasPanel canvasPanel;
    private JSpinner windowSpinner;
    private JCheckBox heatingBox;

    public PictureForm() {
        floorSpinner.setValue(2);
        windowSpinner.setValue(3);
        heatingBox.setSelected(true);

        floorSpinner.addChangeListener(new ChangeListener() {
            @Override
            public void stateChanged(ChangeEvent e) {
                int floors = (int) floorSpinner.getValue();
                canvasPanel.setFloors(floors);
            }
        });

        windowSpinner.addChangeListener(new ChangeListener() {
            @Override
            public void stateChanged(ChangeEvent e) {
                int windows = (int) windowSpinner.getValue();
                canvasPanel.setWindows(windows);
            }
        });

        heatingBox.addChangeListener(new ChangeListener() {
            @Override
            public void stateChanged(ChangeEvent e) {
                boolean heating = (boolean) heatingBox.isSelected();
                canvasPanel.setHeating(heating);
            }
        });
    }

    public static void main(String[] args) {
        JFrame frame = new JFrame("Домик `\\_(*)_/'");
        frame.setContentPane(new PictureForm().mainPanel);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
}
```

```

        frame.pack();
        frame.setVisible(true);
    }

    private void createUIComponents() {
        // TODO: place custom component creation code here
        floorSpinner = new JSpinner(new SpinnerNumberModel(2, -2, 10,
↪ 1));
        windowSpinner = new JSpinner(new SpinnerNumberModel(3, 0, 100,
↪ 1));
    }
}

```

CanvasPanel.java

```

import javax.swing.*;
import java.awt.*;

public class CanvasPanel extends JPanel {
    private int floors = 2;
    private int windows = 3;
    private boolean heating = true;

    public void setFloors(int floors){
        this.floors = floors;
        repaint();
    }

    public void setWindows(int windows) {
        this.windows = windows;
        repaint();
    }

    public void setHeating(boolean heating) {
        this.heating = heating;
        repaint();
    }

    @Override
    protected void paintComponent(Graphics g){
        super.paintComponent(g);
        Color brown = new Color(136, 69, 53);
        Color blue = new Color(127, 181, 181);
        Color green = new Color(20, 124, 20);
        int width = 100 + (windows - 1) * 70;
        int x0 = (this.getWidth() - width) / 2;
        int y0 = 950 - 100 * floors;
        for (int i = 1; i <= floors; i++){
            g.setColor(brown);
            y0 = 950 - 100 * i;
            g.fillRect(x0,y0,width,100);
            g.setColor(Color.BLACK);
            g.drawRect(x0, y0, width,100);
            for (int j = 0; j < windows; j++) {
                g.setColor(Color.BLACK);
                g.drawRect(x0 + 30 + j * 70, y0 + 20, 40, 60);
                g.setColor(blue);
                g.fillRect(x0 + 30 + j * 70, y0 + 20, 40, 60);
            }
        }

        g.setColor(green);
        g.fillRect(0, 950,1000, 50);
    }
}

```

```

    if (heating) {
        g.setColor(brown.darker().darker());
        int heatingWidth = windows > 2 ? 40 : 7 + windows * 10;
        g.fillRect(x0 + 3 * width / 4, y0 - 70, heatingWidth, 70);
    }

    g.setColor(Color.PINK);
    int[] arrX = new int[]{
        x0, getWidth() / 2, getWidth() - x0
    };
    int[] arrY = new int[]{
        y0, y0 - 50, y0
    };
    g.fillPolygon(arrX, arrY, 3);
}
}

```

Конструктор формы

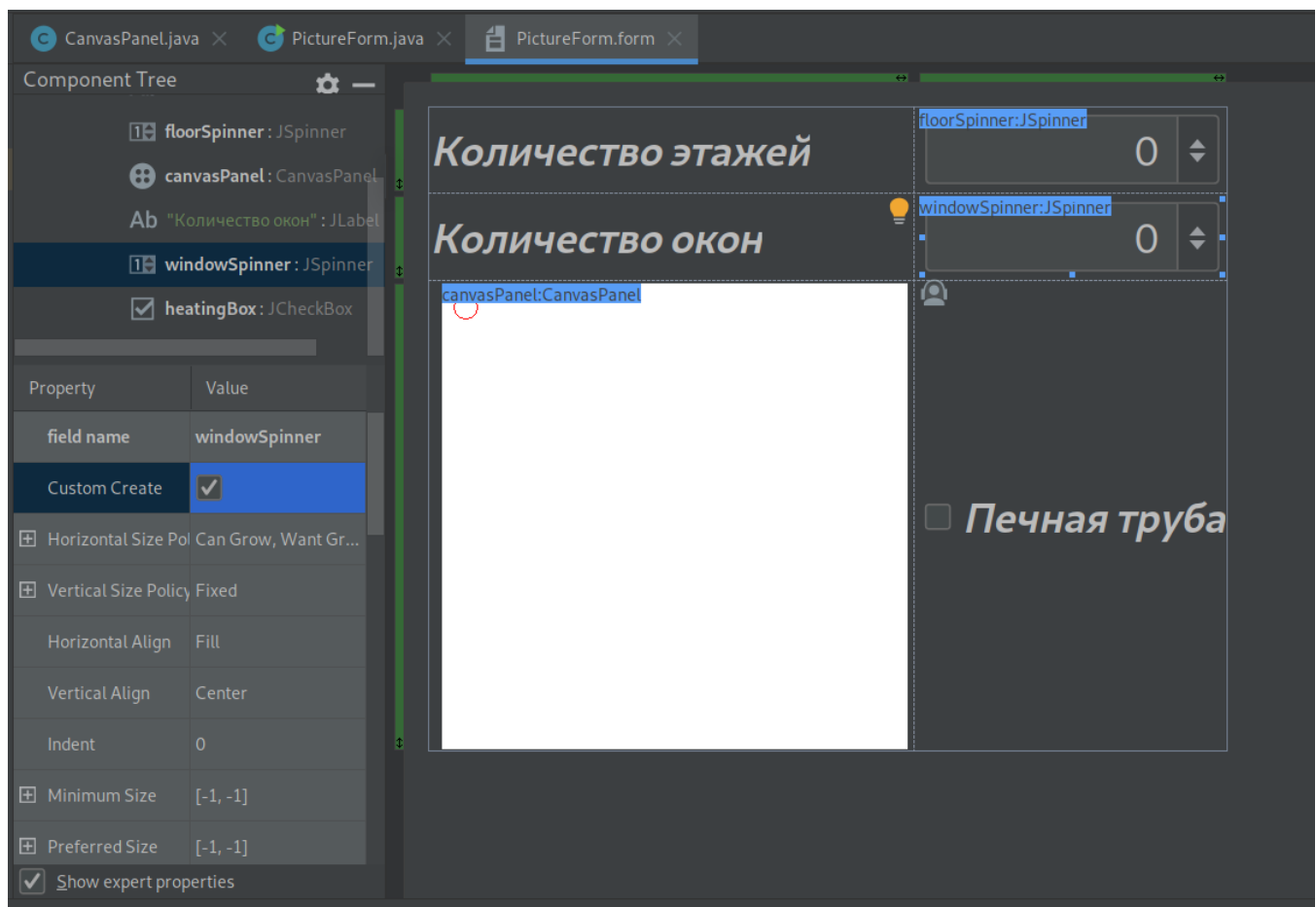


Рис. 1: IntelliJ Form creator

Примеры вывода

The image shows a screenshot of a simple graphical user interface for a house-building application. The window has a title bar with the text "Домик" (House) and standard window control buttons (minimize, maximize, close). The main area is divided into two sections. The top section has a light gray background and contains two labels: "Количество этажей" (Number of floors) and "Количество окон" (Number of windows). To the right of these labels are two input fields. The first input field contains the number "2" and has up and down arrow buttons. The second input field contains the number "3" and also has up and down arrow buttons. The bottom section has a white background and contains a large, empty rectangular area for drawing. In the bottom right corner of this section, there is a checkbox labeled "Печная труба" (Stovepipe). The checkbox is checked, and a small brown rectangle representing the stovepipe is visible on the roof of the house. The house itself is a simple brown rectangle with a red roof and a chimney. It has six windows arranged in two rows of three. The house is positioned on a green rectangular base representing grass.

Рис. 2: Пример 1

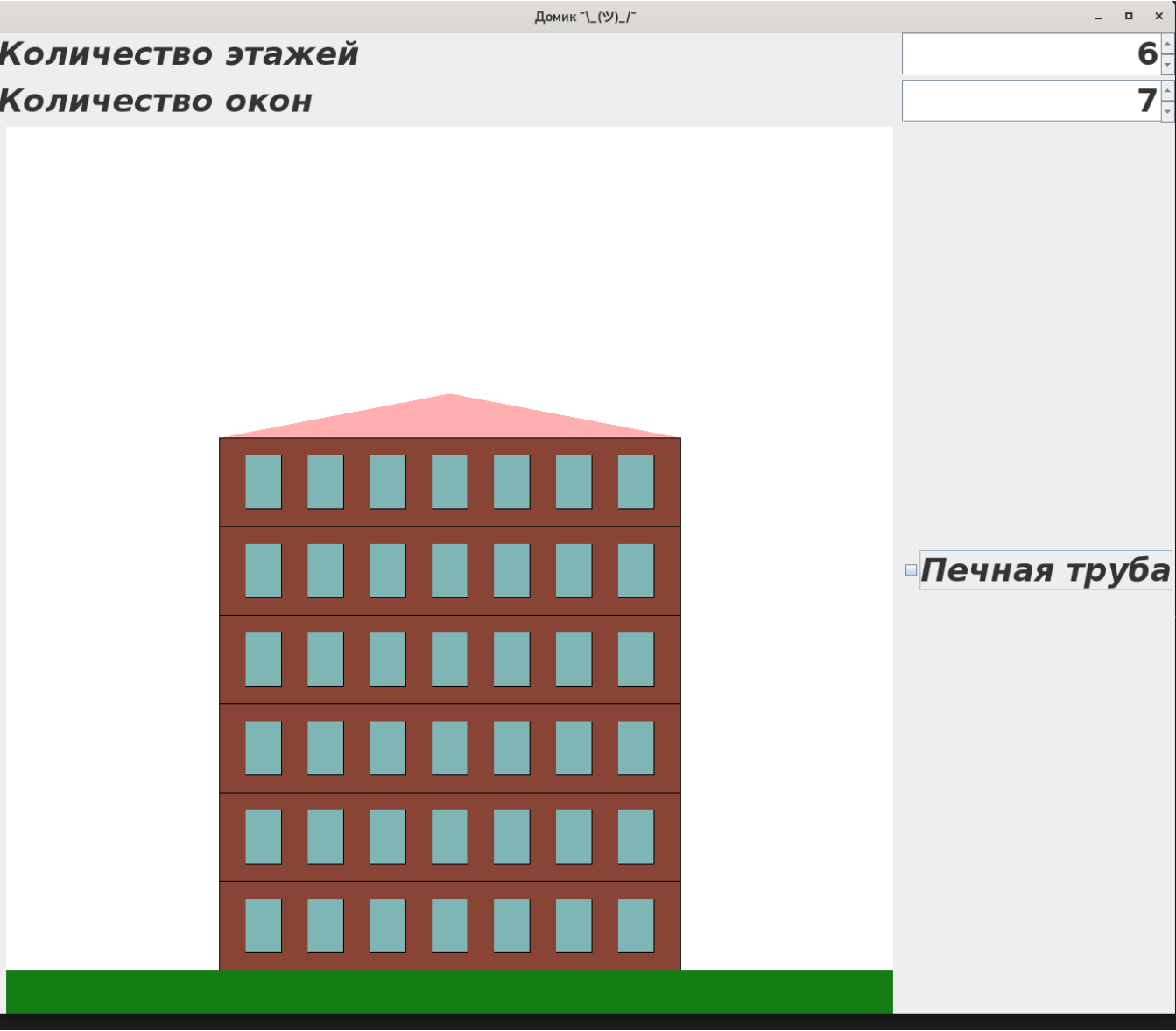


Рис. 3: Пример 2