# PROGRAMOWANIE OBIEKTOWE

## GUI JAVA SWING LABORATORIUM

## JSPINNER, JSLIDER, JPROGRESSBAR, JMENUBAR, JMENU AND JMENUITEM, JTOOLBARM

### JSPINNER

```
public class JSpinner extends JComponent implements Accessible
```

**Commonly used Constructors:**

| Constructor | Description |
|---|---|
| **JSpinner()** | It is used to construct a spinner with an Integer SpinnerNumberModel with initial value 0 and no minimum or maximum limits. |
| **JSpinner(SpinnerModel model)** | It is used to construct a spinner for a given model. |

**Commonly used Methods:**

| Methods | Description |
|---|---|
| **void addChangeListener(ChangeListener listener)** | It is used to add a listener to the list that is notified each time a change to the model occurs. |
| **Object getValue()** | It is used to return the current value of the mode |

### PRZYKŁAD

```
    import javax.swing.*;
    import javax.swing.event.*;
    public class SpinnerExample {
        public static void main(String[] args) {
        JFrame f=new JFrame("Spinner Example");
        final JLabel label = new JLabel();
                 label.setHorizontalAlignment(JLabel.CENTER);
                 label.setSize(250,100);
        SpinnerModel value =
                 new SpinnerNumberModel(5, //initial value
                    0, //minimum value
                    10, //maximum value
                    1); //step
        JSpinner spinner = new JSpinner(value);
                spinner.setBounds(100,100,50,30);
                f.add(spinner);  f.add(label);
               f.setSize(300,300);
               f.setLayout(null);
               f.setVisible(true);
               spinner.addChangeListener(new ChangeListener() {
            public void stateChanged(ChangeEvent e) {
             label.setText("Value : " +
((JSpinner)e.getSource()).getValue());
            }
         });
    }
    }
```

## JSLIDER

### Commonly used Constructors:

| Constructor | Description |
|---|---|
| **JSlider()** | creates a slider with the initial value of 50 and range of 0 to 100. |
| **JSlider(int orientation)** | creates a slider with the specified orientation set by either JSlider.HORIZONTAL or JSlider.VERTICAL with the range 0 to 100 and initial value 50. |
| **JSlider(int min, int max)** | creates a horizontal slider using the given min and max. |
| **JSlider(int min, int max, int value)** | creates a horizontal slider using the given min, max and value. |
| **JSlider(int orientation, int min, int max, int value)** | creates a slider using the given orientation, min, max and value. |

### Commonly used Methods:

| Methods | Description |
|---|---|
| **public void setMinorTickSpacing(int n)** | is used to set the minor tick spacing to the slider. |
| **public void setMajorTickSpacing(int n)** | is used to set the major tick spacing to the slider. |
| **public void setPaintTicks(boolean b)** | is used to determine whether tick marks are painted. |
| **public void setPaintLabels(boolean b)** | is used to determine whether labels are painted. |
| **public void setPaintTracks(boolean b)** | is used to determine whether track is painted. |

### PRZYKŁAD

```
import javax.swing.*;
public class SliderExample extends JFrame{
public SliderExample() {
JSlider slider = new JSlider(JSlider.HORIZONTAL, 0, 50, 25);
slider.setMinorTickSpacing(2);
slider.setMajorTickSpacing(10);
slider.setPaintTicks(true);
slider.setPaintLabels(true);

JPanel panel=new JPanel();
panel.add(slider);
add(panel);
}
public static void main(String s[]) {
SliderExample frame=new SliderExample();
frame.pack();
frame.setVisible(true);
}
}
```

## JPROGRESSBAR

```
public class JProgressBar extends JComponent implements SwingConstants,
Accessible
```

### Commonly used Constructors:

| Constructor | Description |
|---|---|
| **JProgressBar()** | It is used to create a horizontal progress bar but no string text. |
| **JProgressBar(int min, int max)** | It is used to create a horizontal progress bar with the specified minimum and maximum value. |
| **JProgressBar(int orient)** | It is used to create a progress bar with the specified orientation, it can be either Vertical or Horizontal by using SwingConstants.VERTICAL and SwingConstants.HORIZONTAL constants. |
| **JProgressBar(int orient, int min, int max)** | It is used to create a progress bar with the specified orientation, minimum and maximum value. |

### Commonly used Methods:

| Methods | Description |
|---|---|
| **void setStringPainted(boolean b)** | It is used to determine whether string should be displayed. |
| **void setString(String s)** | It is used to set value to the progress string. |
| **void setOrientation(int orientation)** | It is used to set the orientation, it may be either vertical or horizontal by using SwingConstants.VERTICAL and SwingConstants.HORIZONTAL constants. |
| **void setValue(int value)** | It is used to set the current value on the progress bar. |

### PRZYKŁAD

```
import javax.swing.*;
public class ProgressBarExample extends JFrame{
JProgressBar jb;
int i=0,num=0;
ProgressBarExample(){
jb=new JProgressBar(0,2000);
jb.setBounds(40,40,160,30);
jb.setValue(0);
jb.setStringPainted(true);
add(jb);
setSize(250,150);
setLayout(null);
}
public void iterate(){
while(i<=2000){
  jb.setValue(i);
  i=i+20;
  try{Thread.sleep(150);}catch(Exception e){}
}
}
public static void main(String[] args) {
    ProgressBarExample m=new ProgressBarExample();
```

```
        m.setVisible(true);
        m.iterate();
    }
    }
```

### JMENUBAR, JMENU AND JMENUITEM

```
public class JMenuBar extends JComponent implements MenuElement, Accessible
public class JMenu extends JMenuItem implements MenuElement, Accessible
public class JMenuItem extends AbstractButton implements Accessible,
MenuElement
```

### PRZYKŁAD JAVA JMENUITEM AND JMENU EXAMPLE

```
     import javax.swing.*;
    class MenuExample
    {
              JMenu menu, submenu;
              JMenuItem i1, i2, i3, i4, i5;
              MenuExample(){
              JFrame f= new JFrame("Menu and MenuItem Example");
              JMenuBar mb=new JMenuBar();
              menu=new JMenu("Menu");
              submenu=new JMenu("Sub Menu");
              i1=new JMenuItem("Item 1");
              i2=new JMenuItem("Item 2");
              i3=new JMenuItem("Item 3");
              i4=new JMenuItem("Item 4");
              i5=new JMenuItem("Item 5");
              menu.add(i1); menu.add(i2); menu.add(i3);
              submenu.add(i4); submenu.add(i5);
              menu.add(submenu);
              mb.add(menu);
              f.setJMenuBar(mb);
              f.setSize(400,400);
              f.setLayout(null);
              f.setVisible(true);
    }
    public static void main(String args[])
    {
    new MenuExample();
    }}
```

### JTABLE POPUP MENU EXAMPLE

```
import javax.swing.JFrame;
import javax.swing.JMenuItem;
import javax.swing.JPopupMenu;
import javax.swing.JScrollPane;
import javax.swing.JTable;
import javax.swing.SwingUtilities;
import javax.swing.table.DefaultTableModel;


public class JTablePopupMenuExample extends JFrame implements
ActionListener {

    private JTable table;
```

```
    private DefaultTableModel tableModel;
    private JPopupMenu popupMenu;
    private JMenuItem menuItemAdd;
    private JMenuItem menuItemRemove;
    private JMenuItem menuItemRemoveAll;

    public JTablePopupMenuExample() {
        super("JTable Popup Menu Example");

        // sample table data
        String[] columnNames = new String[] {"Title", "Author",
"Publisher", "Published Date", "Pages", "Rating"};
        String[][] rowData = new String[][] {
            {"Effective Java", "Joshua Bloch", "Addision-Wesley", "May 08th
2008", "346", "5"},
            {"Thinking in Java", "Bruce Eckel", "Prentice Hall", "Feb 26th
2006", "1150", "4"},
            {"Head First Java", "Kathy Sierra & Bert Bates", "O'Reilly
Media", "Feb 09th 2005", "688", "4.5"},
        };


        // constructs the table with sample data
        tableModel = new DefaultTableModel(rowData, columnNames);
        table = new JTable(tableModel);

        // constructs the popup menu
        popupMenu = new JPopupMenu();
        menuItemAdd = new JMenuItem("Add New Row");
        menuItemRemove = new JMenuItem("Remove Current Row");
        menuItemRemoveAll = new JMenuItem("Remove All Rows");

        menuItemAdd.addActionListener(this);
        menuItemRemove.addActionListener(this);
        menuItemRemoveAll.addActionListener(this);

        popupMenu.add(menuItemAdd);
        popupMenu.add(menuItemRemove);
        popupMenu.add(menuItemRemoveAll);

        // sets the popup menu for the table
        table.setComponentPopupMenu(popupMenu);

        table.addMouseListener(new TableMouseListener(table));

        // adds the table to the frame
        add(new JScrollPane(table));

        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setSize(640, 150);
        setLocationRelativeTo(null);
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            @Override
            public void run() {
                new JTablePopupMenuExample().setVisible(true);
            }
        });
    }
```

```
    @Override
    public void actionPerformed(ActionEvent event) {
        JMenuItem menu = (JMenuItem) event.getSource();
        if (menu == menuItemAdd) {
            addNewRow();
        } else if (menu == menuItemRemove) {
            removeCurrentRow();
        } else if (menu == menuItemRemoveAll) {
            removeAllRows();
        }
    }

    private void addNewRow() {
        tableModel.addRow(new String[0]);
    }

    private void removeCurrentRow() {
        int selectedRow = table.getSelectedRow();
        tableModel.removeRow(selectedRow);
    }

    private void removeAllRows() {
        int rowCount = tableModel.getRowCount();
        for (int i = 0; i < rowCount; i++) {
            tableModel.removeRow(0);
        }
    }
}
```

```
import javax.swing.JTable;

public class TableMouseListener extends MouseAdapter {

    private JTable table;

    public TableMouseListener(JTable table) {
        this.table = table;
    }

    @Override
    public void mousePressed(MouseEvent event) {
        // selects the row at which point the mouse is clicked
        Point point = event.getPoint();
        int currentRow = table.rowAtPoint(point);
        table.setRowSelectionInterval(currentRow, currentRow);
    }
}
```

**PRZYKŁAD JAVA SWING DRAG AND DROP**

```
package DnD;

import java.awt.BorderLayout;
import java.awt.Container;
import java.awt.datatransfer.DataFlavor;
import java.awt.datatransfer.StringSelection;
import java.awt.datatransfer.Transferable;
```

```
import javax.swing.Box;
import javax.swing.DefaultListModel;
import javax.swing.DropMode;
import javax.swing.JComponent;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JList;
import javax.swing.JScrollPane;
import javax.swing.JTextField;
import javax.swing.ListSelectionModel;
import javax.swing.SwingUtilities;
import javax.swing.TransferHandler;

public class Main extends JFrame {
    private JTextField newTextField = new JTextField(10);
    private JList<String> sourceList = new JList<>(new
DefaultListModel<>());
    private JList<String> destList = new JList<>(new DefaultListModel<>());
    public Main() {

        for (int i = 0; i < 15; i++) {
            ((DefaultListModel<String>) sourceList.getModel()).add(i, "A "
+ i);
            ((DefaultListModel<String>) destList.getModel()).add(i, "B " +
i);
        }
        Box nameBox = Box.createHorizontalBox();
        nameBox.add(new JLabel("New:"));
        nameBox.add(newTextField);

        Box sourceBox = Box.createVerticalBox();
        sourceBox.add(new JLabel("Source"));
        sourceBox.add(new JScrollPane(sourceList));

        Box destBox = Box.createVerticalBox();
        destBox.add(new JLabel("Destination"));
        destBox.add(new JScrollPane(destList));

        Box listBox = Box.createHorizontalBox();
        listBox.add(sourceBox);
        listBox.add(destBox);

        Box allBox = Box.createVerticalBox();
        allBox.add(nameBox);
        allBox.add(listBox);

        this.getContentPane().add(allBox, BorderLayout.CENTER);

        sourceList.setSelectionMode(ListSelectionModel.SINGLE_SELECTION);
        destList.setSelectionMode(ListSelectionModel.SINGLE_SELECTION);

        newTextField.setDragEnabled(true);
        sourceList.setDragEnabled(true);
        destList.setDragEnabled(true);

        sourceList.setDropMode(DropMode.INSERT);
        destList.setDropMode(DropMode.INSERT);

        sourceList.setTransferHandler(new ListTransferHandler());
        destList.setTransferHandler(new ListTransferHandler());
    }
```

```
    public static void main(String[] args) {
        SwingUtilities.invokeLater(() -> {
            Main frame = new Main();
            frame.pack();
            frame.setVisible(true);
        });
    }
}
class ListTransferHandler extends TransferHandler {
    @Override
    public int getSourceActions(JComponent c) {
        return TransferHandler.COPY_OR_MOVE;
    }
    @Override
    protected Transferable createTransferable(JComponent source) {
        JList<String> sourceList = (JList<String>) source;
        String data = sourceList.getSelectedValue();
        Transferable t = new StringSelection(data);
        return t;
    }

    @Override
    protected void exportDone(JComponent source, Transferable data, int
action) {
        @SuppressWarnings("unchecked")
        JList<String> sourceList = (JList<String>) source;
        String movedItem = sourceList.getSelectedValue();
        if (action == TransferHandler.MOVE) {
            DefaultListModel<String> listModel = (DefaultListModel<String>)
sourceList
                    .getModel();
            listModel.removeElement(movedItem);
        }
    }
    @Override
    public boolean canImport(TransferHandler.TransferSupport support) {
        if (!support.isDrop()) {
            return false;
        }
        return support.isDataFlavorSupported(DataFlavor.stringFlavor);
    }
    @Override
    public boolean importData(TransferHandler.TransferSupport support) {
        if (!this.canImport(support)) {
            return false;
        }
        Transferable t = support.getTransferable();
        String data = null;
        try {
            data = (String) t.getTransferData(DataFlavor.stringFlavor);
            if (data == null) {
                return false;
            }
        } catch (Exception e) {
            e.printStackTrace();
            return false;
        }
        JList.DropLocation dropLocation = (JList.DropLocation) support
                .getDropLocation();
        int dropIndex = dropLocation.getIndex();
        JList<String> targetList = (JList<String>) support.getComponent();
```

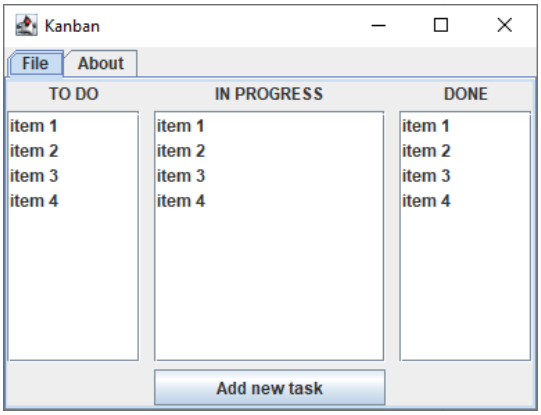
```
        DefaultListModel<String> listModel = (DefaultListModel<String>)
targetList
                .getModel();
        if (dropLocation.isInsert()) {
            listModel.add(dropIndex, data);
        } else {
            listModel.set(dropIndex, data);
        }
        return true;
    }
}
```

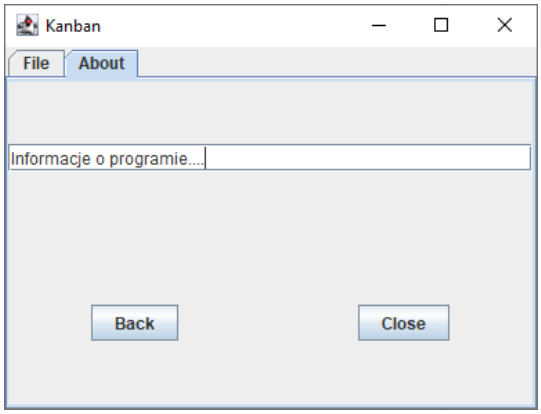
**Zadania do samodzielnego rozwiązania**

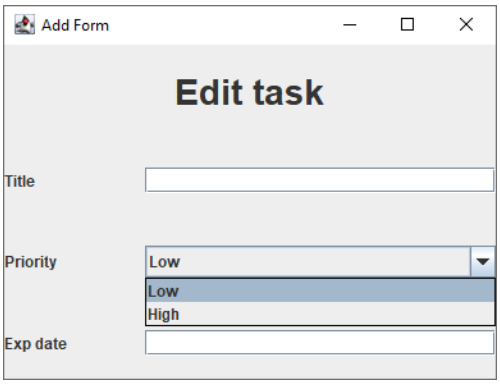
**Zadanie 1.**

Stwórz aplikację do zarządzania projektami w oparciu o metodę Kanban, opis metody możesz znaleźć pod adresem: https://pl.wikipedia.org/wiki/Tablica_kanban , https://kanbantool.com/pl/tablica-kanban

Mockup aplikacji: Przedstawiony poniżej mockup należy traktować poglądowo. Jego celem jest ilustracja elementów, które są wymagane w aplikacji. Natomiast konkretne komponenty Java powinny zostać wybrane wedle własnego uznania.




Aplikacja powinna posiadać następujące funkcjonalności:

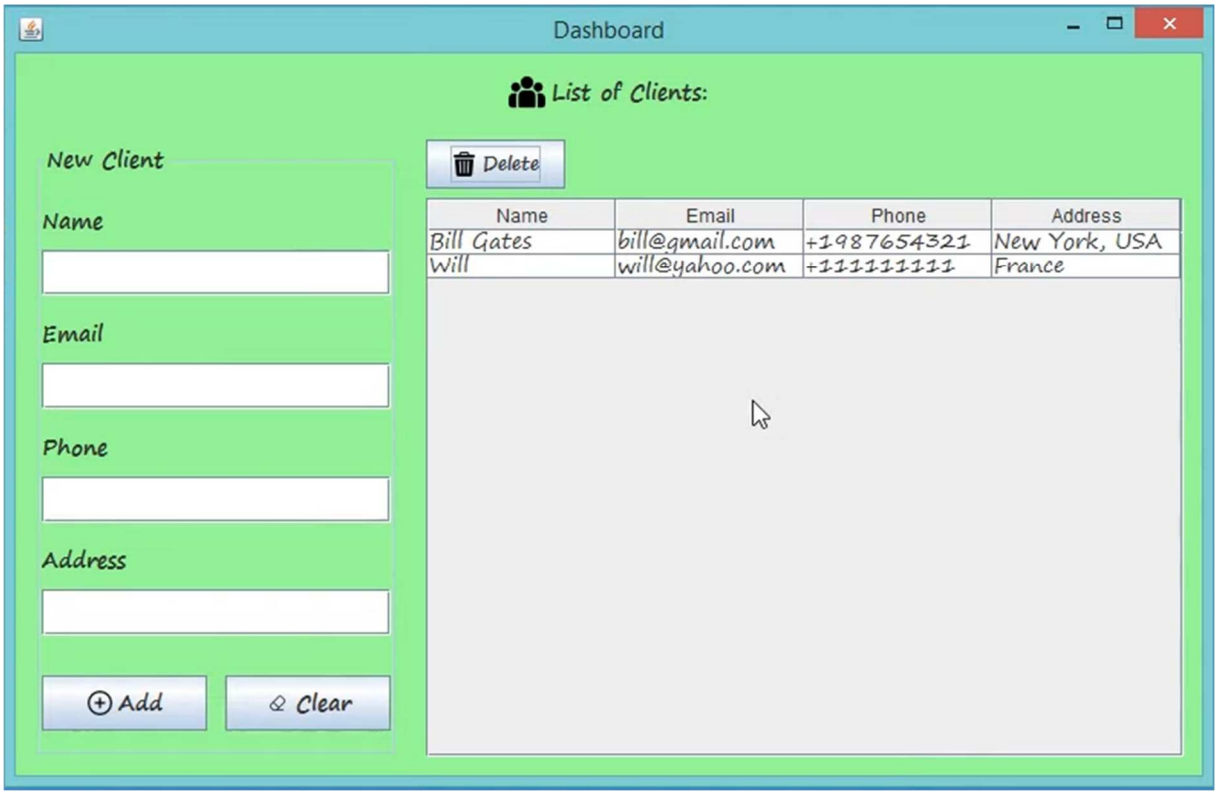
- Dodawanie nowego zadania przy użyciu formularza, który wyświetla się po wciśnięciu przycisku "Add new task". Formularz pozwala na wprowadzenie takich informacji jak: tytuł, opis, priorytet, termin ważności (wykorzystaj JDateChooser).
- Nowe zadanie domyślnie pokazuje się na liście "TODO"
- Po najechaniu na element z listy powinien się wyświetlić Tooltip zawierający opis zadania (należy wykorzystać metodę setToolTipText()).
- Po kliknięciu prawym przyciskiem myszy na element z listy powinno się wyświetlić Menu z dwoma opcjami:
    - Delete (usuwa element)
    - Edit (wyświetla formularz do edycji zadania).

(Wskazówka należy użyć popup menu – tworzenie patrz przykład w materiałach.)

- Możliwe jest przenoszenie zadań między listami – implementacja dowolna (dedykowany przycisk lub drag-and-drop (przeanalizuj przykład użycia DaD)
- Zadbaj o czytelność i ergonomię aplikacji.

**Zadanie 2**

Stwórz aplikację do zarządzania bazą klientów. Poniżej przedstawiono widoki jakie powinna zawierać aplikacja (nie musisz trzymać się 1:1 widoku).




Aplikacja powinna posiadać następujące funkcjonalności:

- Dodawane klienta poprzez odpowiednie pola wraz z walidacją – wszystkie pola muszą być uzupełnione.
- Przycisk Clear czyści pola
- Add – sprawdza czy pola są uzupełnione i dodaje klienta do bazy.
- Po zaznaczeniu klienta w tabeli i kliknięciu Delete usuwamy zaznaczony rekord.