

```
public class Turtle
{
    private Point position;
    private String name;
    private Color color;

    public Turtle(Point position, String name, Color color)
    {
        this.position = position;
        this.name = name;
        this.color = color;
    }

    public Point getPosition()
    {
        return position;
    }

    public String getName()
    {
        return name;
    }

    public String toString()
    {
        return name;
    }

    public void goRight(int pDist)
    {
        position.x += pDist;
        // ou:
        // position.setLocation(position.x+pDist, position.y);
    }

    public void goLeft(int pDist)
    {
        position.x -= pDist;
        // ou:
        // position.setLocation(position.x-pDist, position.y);
    }

    public void goUp(int pDist)
    {
        position.y -= pDist;
        // ou:
        // position.setLocation(position.x, position.y-pDist);
    }

    public void goDown(int pDist)
    {
        position.y += pDist;
        // ou:
        // position.setLocation(position.x, position.y+pDist);
    }

    public void draw(Graphics g)
    {
        // Dessiner la tortue avec la couleur donnée
        int x = getPosition().x;
        int y = getPosition().y;

        g.setColor(color);
        g.fillOval(x - 2, y - 10, 5, 7);
        g.fillOval(x - 7, y - 5, 15, 15);
        g.drawLine(x - 10, y - 5, x + 10, y + 12);
        g.drawLine(x - 10, y + 12, x + 10, y - 5);

        // Dessiner le nom à côté en bleu
        //g.setColor(Color.BLUE);
        g.drawString(name, x - 10, y + 24);
    }
}
```

```
public class Turtles
{
    private ArrayList<Turtle> allTurtles = new ArrayList<>();

    public Turtle remove(int pIndex)
    {
        return allTurtles.remove(pIndex);
    }

    public Turtle get(int pIndex)
    {
        return allTurtles.get(pIndex);
    }

    public void add(Turtle pTurtle)
    {
        allTurtles.add(pTurtle);
    }

    public Object[] toArray()
    {
        return allTurtles.toArray();
    }

    public void draw(Graphics g)
    {
        for (int i = 0; i < allTurtles.size(); i++)
            allTurtles.get(i).draw(g);
    }

    public int findByName(String pName)
    {
        // Version plus correcte algorithmiquement,
        // mais moins élégante et moins facile à comprendre

        boolean found = false;
        int i = 0;
        while ((!found) && (i < allTurtles.size()))
        {
            if (allTurtles.get(i).getName().equals(pName))
                found = true;
            else
                i++;
        }
        if (found)
            return i;
        else
            return -1;
    }
}
```

```
public class DrawPanel extends javax.swing.JPanel
{
    private Turtles turtles = null;

    public void setTurtle(Turtles turtles)
    {
        this.turtles = turtles;
    }

    public DrawPanel()
    {
        initComponents();
    }

    public void paintComponent(Graphics g)
    {
        int w = getWidth();
        int h = getHeight();

        g.setColor(Color.WHITE);
        g.fillRect(0, 0, w, h);

        if (turtles != null)
            turtles.draw(g);
    }
    // Skipped: ... initComponents { ... }
    // Variables declaration - do not modify//GEN-BEGIN:variables
    // End of variables declaration//GEN-END:variables
}
```

```

public class MainFrame extends javax.swing.JFrame
{
    private Turtles turtles = new Turtles();
    public MainFrame()
    {
        initComponents();
        drawPanel.setTurtle(turtles);
        updateView();
    }
    public void updateView()
    {
        turtleList.setListData(turtles.toArray());
        repaint();
    }
}
// Skipped: ... initComponents { ... }
private void rightButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_rightButtonActionPerformed
{//GEN-HEADEREND:event_rightButtonActionPerformed
    int i = turtleList.getSelectedIndex();
    if (i >= 0)
        turtles.get(i).goRight(10);
    repaint();
} //GEN-LAST:event_rightButtonActionPerformed

private void leftButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_leftButtonActionPerformed
{//GEN-HEADEREND:event_leftButtonActionPerformed
    int i = turtleList.getSelectedIndex();
    if (i >= 0)
        turtles.get(i).goLeft(10);
    repaint();
} //GEN-LAST:event_leftButtonActionPerformed

private void upButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_upButtonActionPerformed
{//GEN-HEADEREND:event_upButtonActionPerformed
    int i = turtleList.getSelectedIndex();
    if (i >= 0)
        turtles.get(i).goUp(10);
    repaint();
} //GEN-LAST:event_upButtonActionPerformed

private void downButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_downButtonActionPerformed
{//GEN-HEADEREND:event_downButtonActionPerformed
    int i = turtleList.getSelectedIndex();
    if (i >= 0)
        turtles.get(i).goDown(10);
    repaint();
} //GEN-LAST:event_downButtonActionPerformed

private void addButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_addButtonActionPerformed
{//GEN-HEADEREND:event_addButtonActionPerformed
    Point position = new Point((int) (Math.random() * drawPanel.getWidth()),
        (int) (Math.random() * drawPanel.getHeight()));
    Turtle turtle = new Turtle(position, nameTextField.getText(), colorChooser.getColor());
    turtles.add(turtle);
    updateView();
} //GEN-LAST:event_addButtonActionPerformed

private void removeButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_removeButtonActionPerformed
{//GEN-HEADEREND:event_removeButtonActionPerformed
    int i = turtleList.getSelectedIndex();
    if (i >= 0)
        turtles.remove(i);
    updateView();
} //GEN-LAST:event_removeButtonActionPerformed

private void newButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_newButtonActionPerformed
{//GEN-HEADEREND:event_newButtonActionPerformed
    turtles = new Turtles();
    drawPanel.setTurtle(turtles);
    updateView();
} //GEN-LAST:event_newButtonActionPerformed

private void findButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_findButtonActionPerformed
{//GEN-HEADEREND:event_findButtonActionPerformed
    int i = turtles.findByName(nameTextField.getText());
    if (i >= 0)
        turtleList.setSelectedIndex(i);
} //GEN-LAST:event_findButtonActionPerformed
// Skipped: ... Look & Feel
// Variables declaration - do not modify//GEN-BEGIN:variables
private javax.swing.JButton addButton;
private javax.swing.JColorChooser colorChooser;
private javax.swing.JButton downButton;
private DrawPanel drawPanel;
private javax.swing.JButton findButton;
private javax.swing.JLabel jLabel1;
private javax.swing.JPanel jPanel1;
private javax.swing.JPanel jPanel2;
private javax.swing.JScrollPane jScrollPane1;
private javax.swing.JButton leftButton;
private javax.swing.JTextField nameTextField;
private javax.swing.JButton newButton;
private javax.swing.JButton removeButton;
private javax.swing.JButton rightButton;
private javax.swing.JList turtleList;
private javax.swing.JButton upButton;
// End of variables declaration//GEN-END:variables
}

```