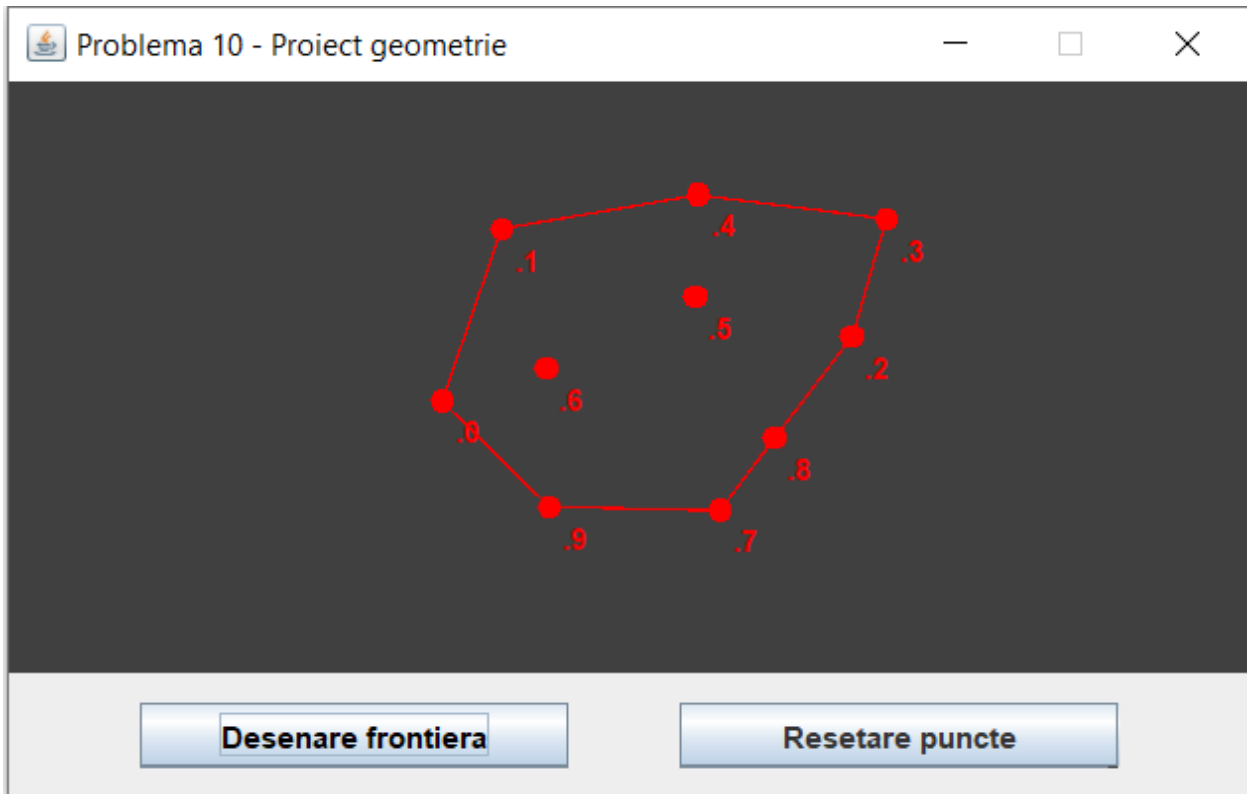
Tudor Vlăduț-Alexandru

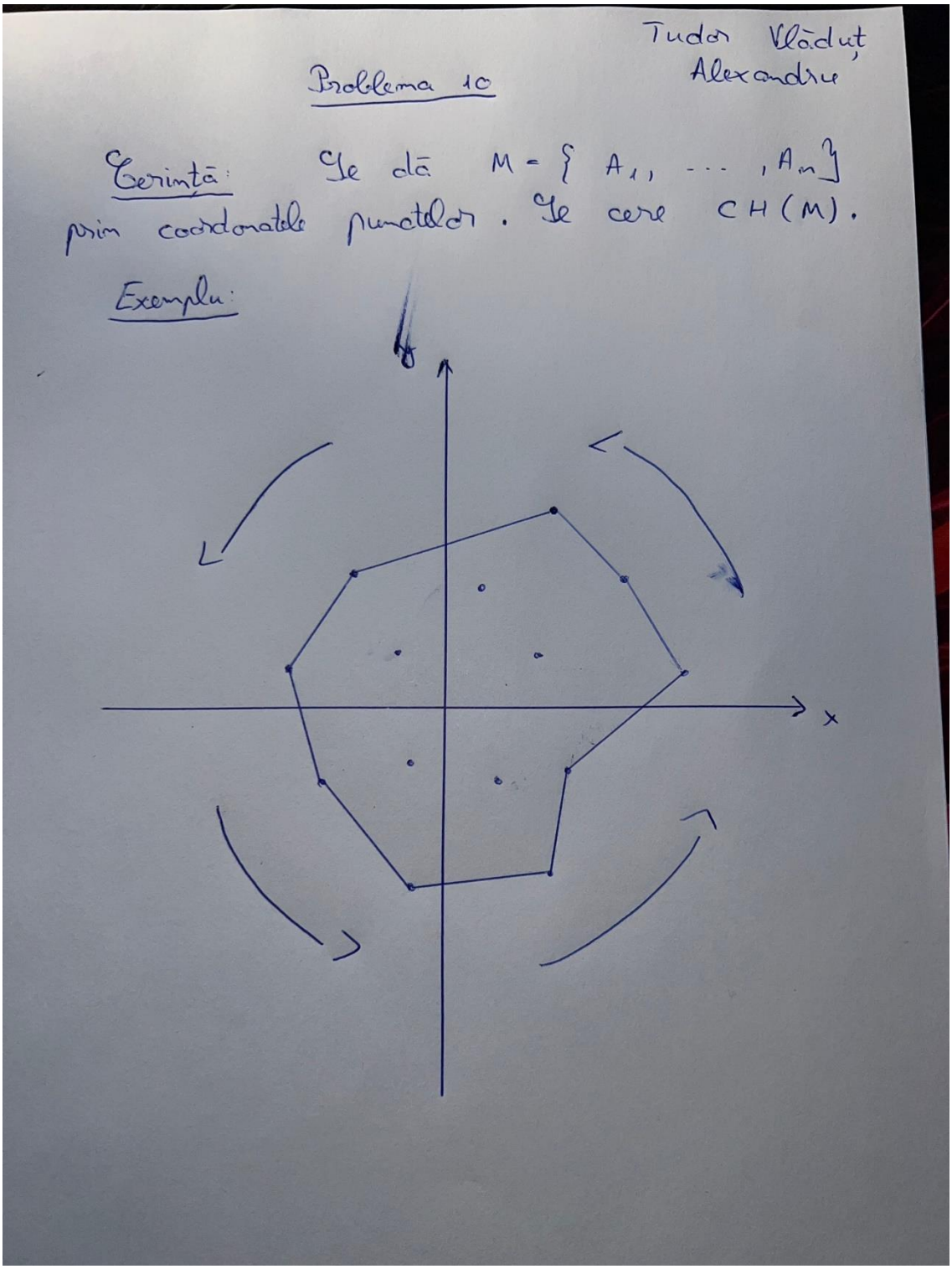
Problema 10

Algoritmul lui Jarvis

Rulaj:



Pe foaie:


Tudor Vlăduț
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Problema 10
Cerință: Se dă M = { A1, ... , An }
prin coordonatele punctelor. Se cere CH(M).
Exemplu:
y
x

Implementare Java:

```
package problema6;
import java.awt.Color;
import java.awt.Dimension;
import java.awt.Graphics;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Scanner;
import java.util.Arrays;
class Point
{
    int x, y;
    Point(int x,int y)
    {
        this.x=x;
        this.y=y;
    }
}
public class Jarvis
{
    private boolean CCW(Point p, Point q, Point r)
    {
        int val = (q.y - p.y) * (r.x - q.x) - (q.x - p.x) * (r.y - q.y);

         if (val >= 0)
             return false;
         return true;
    }
    public ArrayList<Integer> convexHull(ArrayList<Point> points)
    {
        int n = points.size();
        ArrayList<Integer> next=new ArrayList<>();
        int leftMost = 0;
        for (int i = 1; i < n; i++)
            if (points.get( index: i).x < points.get( index: leftMost).x)
```

```
                leftMost = i;
            int p = leftMost, q;
            next.add( e:p);
            do
            {
                q = (p + 1) % n;
                for (int i = 0; i < n; i++)
                  if (CCW( p:points.get( index:p),  q:points.get( index:i),  r:points.get( index:q)))
                    q = i;
                next.add( e:q);
                p = q;
            } while (p != leftMost);
            return next;
        }
    }
```

Frame-ul:

```
package problema6;
import java.awt.event.MouseAdapter;
import java.awt.*;
import java.awt.event.MouseEvent;
import java.awt.event.MouseListener;
import java.awt.image.BufferedImage;
import java.util.*;
import javax.swing.*;
import javax.swing.GroupLayout.Alignment;
import javax.swing.LayoutStyle.ComponentPlacement;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;
import java.awt.*;
public class Frame extends javax.swing.JFrame implements ActionListener, MouseListener{

        static int atm = 0;
        static int c = 0;
        static JLabel clear, lbl1;
        Jarvis j = new Jarvis();
        ArrayList<Point> points = new ArrayList<>();;
        int x,y;
        public Frame() {
                setResizable( resizable:false);
                setTitle( title:"Problema 10 - Proiect geometrie");
                initComponents();
                jPanel1.addMouseListener( l:this);
        }
                public void mouseClicked(MouseEvent e) {
                        x=e.getX();
                        y=e.getY();
                        Graphics g=jPanel1.getGraphics();
                        g.setColor( c:Color.RED);
                        drawCenteredCircle(g, x, y,  r:10);
                        points.add(new Point( x:e.getX(),  y:e.getY()));
```

```
                lbl1 = new JLabel("." + atm);
                lbl1.setForeground(new Color( r:255,  g:0,  b:0));
                jPanel1.add( comp: lbl1);
                lbl1.setLocation(e.getX()+5, e.getY()+5);
                lbl1.setSize( width: 36,  height: 14);
                atm = atm + 1;
            }

            public void drawCenteredCircle(Graphics g, int x, int y, int r) {
                    x = x-(r/2);
                    y = y-(r/2);
                    g.fillOval(x,y, width: r, height: r);
                  }
            public void mousePressed(MouseEvent e) {
            }

            public void mouseReleased(MouseEvent e) {
            }

            public void mouseEntered(MouseEvent e) {
            }

            public void mouseExited(MouseEvent e) {
            }

        @SuppressWarnings("unchecked")
        Generated Code

        public static void main(String args[]) {
                java.awt.EventQueue.invokeLater(new Runnable() {
                        public void run() {
                                new Frame().setVisible( b:true);
                        }

                    });
          }
          private JPanel jPanel1;
          @Override
          public void actionPerformed(ActionEvent arg0) {

          }

}
```