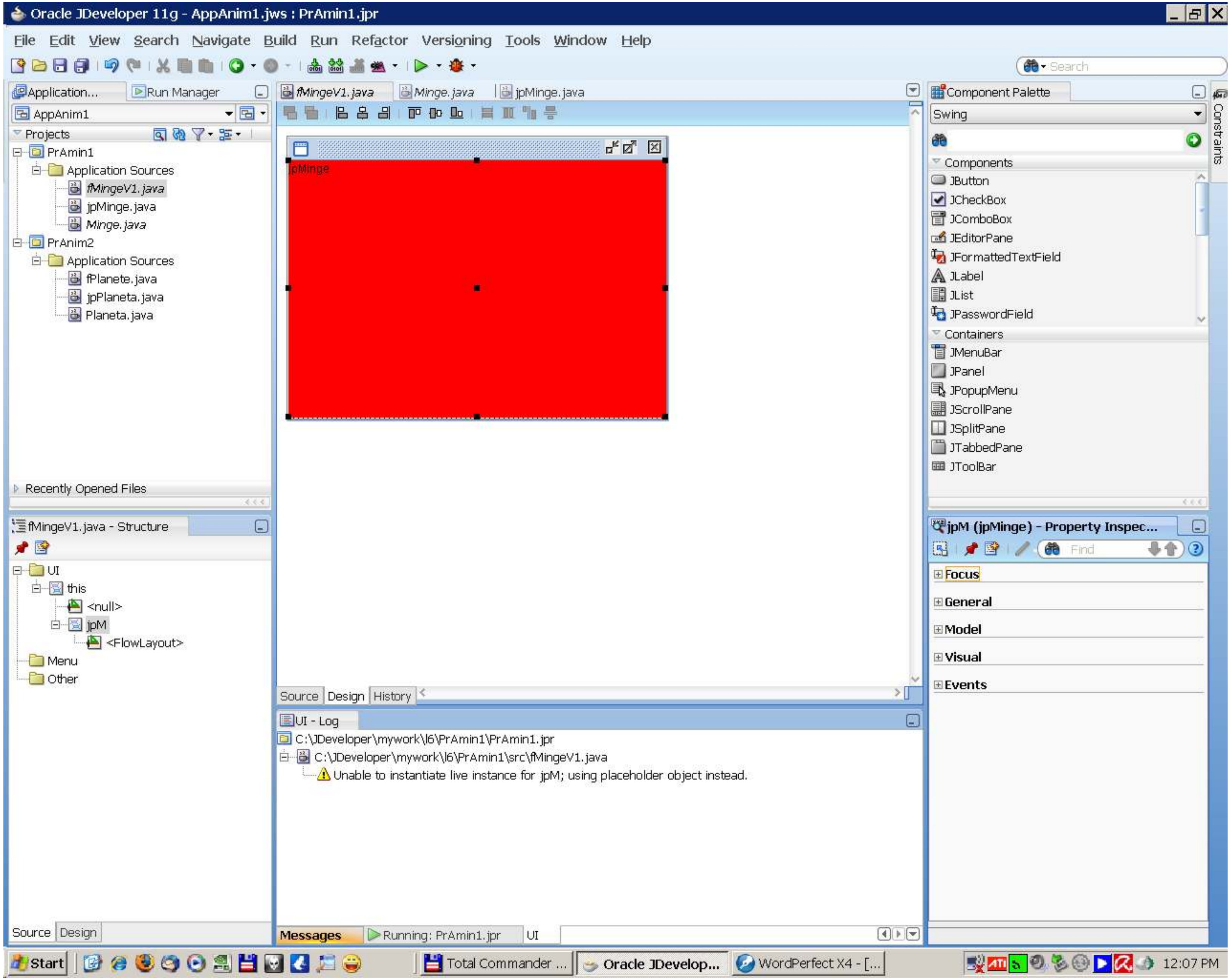


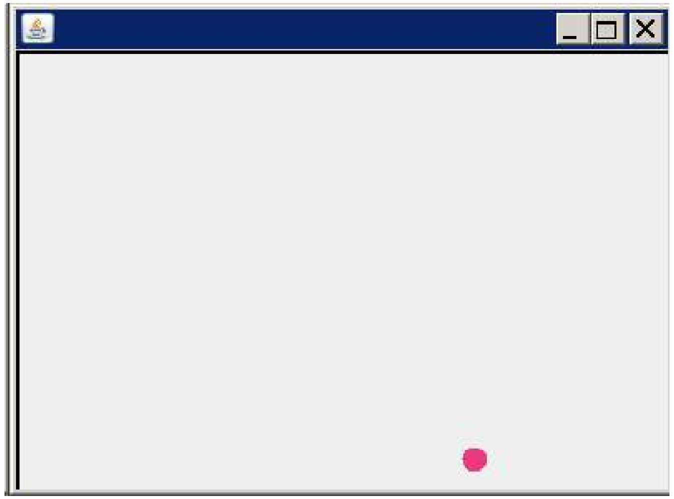
```
C:\JDeveloper\mywork\l6\PrAmin1\PrAmin1.jpr
C:\JDeveloper\mywork\l6\PrAmin1\src\fMingeV1.java
⚠ Unable to instantiate live instance for jpM; using placeholder object instead.
```

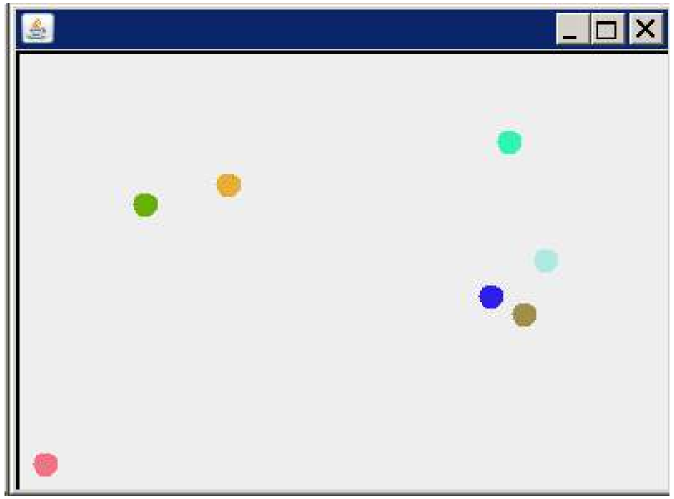
Clasa Minge.java:

```
import java.awt.Color;
import java.awt.Graphics;
import java.awt.geom.Ellipse2D;
import java.awt.geom.Rectangle2D;
import java.util.Random;

public class Minge {
    public double Px, Py; //pozitie minge
    public double Vx, Vy; //viteza minge
    public Color culoare;
    private static final int XSIZE = 15;
    private static final int YSIZE = 15;

    public Minge(int w, int h) {
        this.Px = aleator(w);
        this.Py = aleator(h);
        this.Vx = 2 - aleator(2); //1
        this.Vy = 2 - aleator(2); //1
        this.culoare = new Color(aleator(255) ,aleator(255), aleator(255));
    }
    public Minge(double Px, double Py) {
        this.Px = Px;
        this.Py = Py;
        this.Vx = 2 - aleator(2); //1
        this.Vy = 2 - aleator(2); //1
        this.culoare = new Color(aleator(255) ,aleator(255), aleator(255));
    }
    public int aleator(int i) {
        Random rnd = new Random();
        return rnd.nextInt(i);
    }
    public void move(Rectangle2D bounds)
      {
        Px += Vx;
        Py += Vy;
        if (Px < bounds.getMinX())
        {
          Px = bounds.getMinX();
          Vx = -Vx;
        }
        if (Px + XSIZE >= bounds.getMaxX())
        {
          Px = bounds.getMaxX() - XSIZE;
          Vx = -Vx;
        }
        if (Py < bounds.getMinY())
        {
          Py = bounds.getMinY();
          Vy = -Vy;
        }
        if (Py + YSIZE >= bounds.getMaxY())
        {
          Py = bounds.getMaxY() - YSIZE;
          Vy = -Vy;
        }
      }
    public Ellipse2D desenare(Graphics g)
    {
        g.setColor(culoare);
        return new Ellipse2D.Double(Px, Py, XSIZE, YSIZE);
    }
}
```

Clasa jpMinge.java:

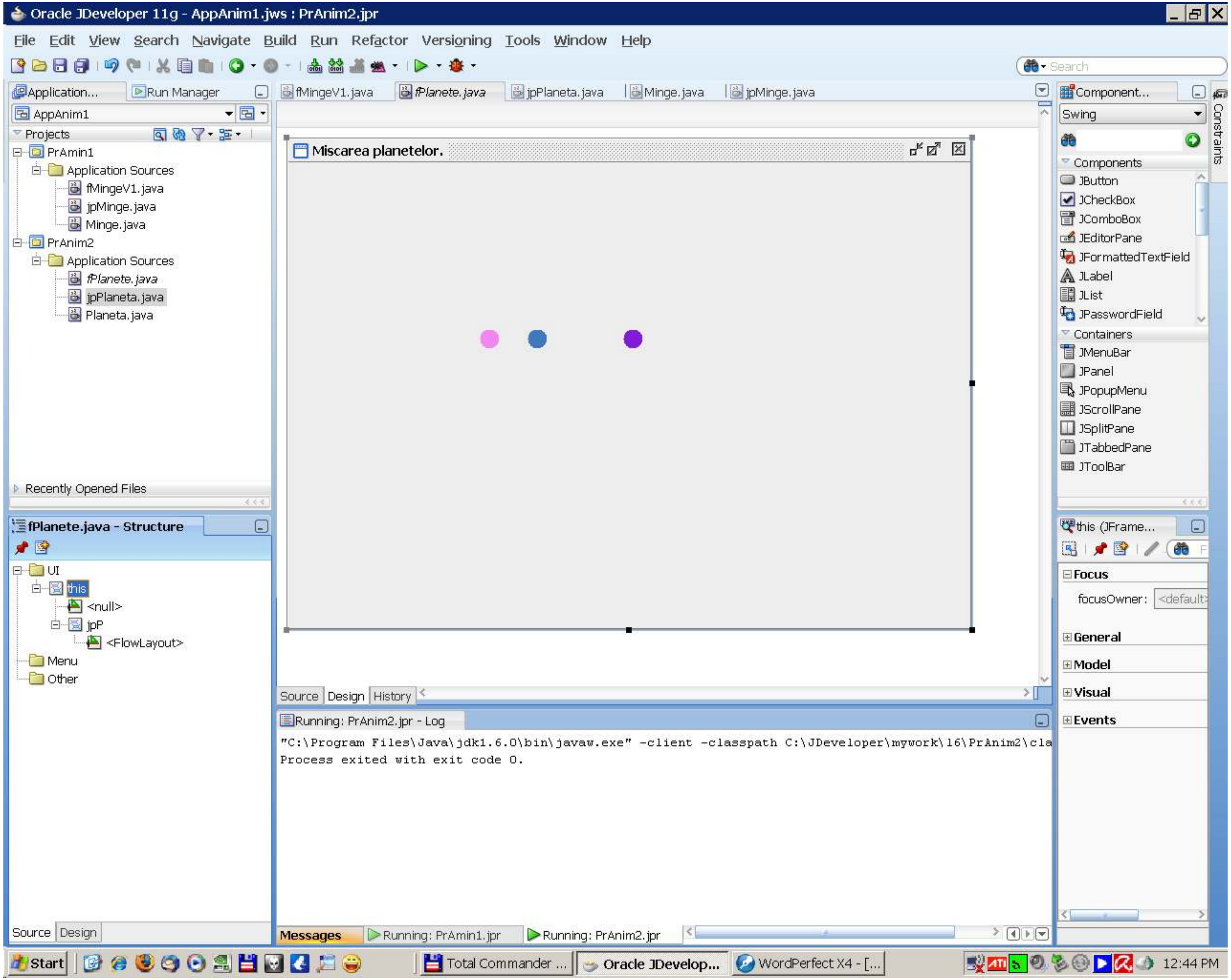
```
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class jpMinge extends JPanel {
    public Minge b1;
    public Minge bile[] = new Minge[9]; //0-9
    public int NR_MINGI;

    public jpMinge(int n) {
        b1 = new Minge(100, 200);

        NR_MINGI = n - 1;
        try {
            for (int i = 0; i < NR_MINGI; ++i)
                bile[i] = new Minge(200, 200);
        } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Numarul maxim de mingi poate fi 10!");
            //poate lucra cu cel mult 10 mingi
            System.exit(1);
        }
    }

    public void paintComponent(Graphics g) {
        super.paintComponent(g);
        Graphics2D g2 = (Graphics2D)g;

        //desenarea mingii b1
        g2.fill(b1.desenare(g2));

        //desenarea a NR_MINGI mingi
        for (int i = 0; i < NR_MINGI; ++i)
            g2.fill(bile[i].desenare(g2));
    }
}
```





Clasa fMingeV1.java:

```
import java.awt.Color;
import java.awt.Dimension;
import java.awt.Rectangle;
import javax.swing.BorderFactory;
import javax.swing.JFrame;

public class fMingeV1 extends JFrame {
   public final int NRMINGI = 7;
   private jpMinge jpM = new jpMinge(NRMINGI);

   public fMingeV1() {
      try {
         jbInit();
      } catch (Exception e) {
         e.printStackTrace();
      }
   }

   private void jbInit() throws Exception {
      this.getContentPane().setLayout(null);
      this.setSize(new Dimension(400, 300));

      //da dimensiunil JPanel-ului
      jpM.setBounds(new Rectangle(0, 0, 395, 270));

      //il pune in coltul din stinga sus
      jpM.setLocation(0, 0);

      //ii trage chenarul
      jpM.setBorder(BorderFactory.createLineBorder(Color.black, 2));
      //il adauga la Frame
      this.getContentPane().add(jpM, null);
   }

   public void miscaMinge() {
      try {
         for (int i = 1; i <= 1000; i++) {
            jpM.b1.move(jpM.getBounds());

            for (int j = 0; j < jpM.NR_MINGI; ++j)
               jpM.bile[j].move(jpM.getBounds());
            /* normal, aici s-ar fi apelat repaint()
             * dar metoda miscaMinge() ocupa tot timpul
             * de executie si repaint() nu mai apuca sa
             * fie apelata
             */
            jpM.paint(jpM.getGraphics());
            Thread.sleep(10);
         }
      } catch (InterruptedException e) {
      }
   }

   public static void main(String[] args) {
      fMingeV1 frame = new fMingeV1();

      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.setVisible(true);
      frame.miscaMinge();

   }
}
```



```
"C:\Program Files\Java\jdk1.6.0\bin\javaw.exe" -client -classpath C:\JDeveloper\mywork\16\PrAnim2\cla
Process exited with exit code 0.
```

Clasa Planeta.java:

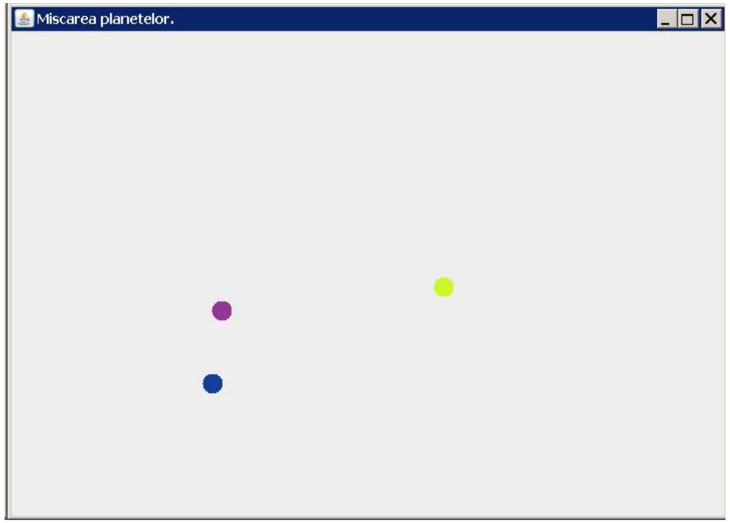
```
import java.awt.Color;
import java.awt.Graphics;
import java.awt.geom.Ellipse2D;
import java.util.Random;

class Planeta {
   public double Px, Py; //pozitia
   public double Vx, Vy; //viteza
   public double masa;
   public double raza;
   public Color culoare;

   private static final int XSIZE = 2;
   private static final int YSIZE = 2;

   public int aleator(int i) {
      Random rnd = new Random();
      return rnd.nextInt(i);
   }

   public Planeta(double x, double y, double vx, double vy, double masa,
               double raza) {
      this.Px = x;
      this.Py = y;
      this.Vx = vx;
      this.Vy = vy;
      this.masa = masa;
      this.raza = raza;
      this.culoare = new Color(aleator(255), aleator(255), aleator(255));
   }

   public void misca() {
      Px += Vx;
      Py += Vy;
   }

   public String toString() {
      return "P(" + Px + "," + Py + ")\n" +
         "V(" + Vx + "," + Vy + ")\n";
   }

   public Ellipse2D desenare(Graphics g) {
      g.setColor(culoare);
      return new Ellipse2D.Double(Px, Py, XSIZE * raza, YSIZE * raza);
   }
}
```

Clasa jpPlaneta.java:

```
import java.awt.Graphics;
import java.awt.Graphics2D;
import javax.swing.JPanel;

public class jpPlaneta extends JPanel {
   public Planeta planete[] = new Planeta[10];
   public int NrPlanete = 0;
   private static final double F_SCALA = 1000;


   public jpPlaneta() {
      /*
      NrPlanete = 2;
      planete[0] = new Planeta(100, 175, 0, -7, 50, 20) ;
      planete[1] = new Planeta(400, 250, 0, 7, 50, 10) ;
      */

      NrPlanete = 3;
      planete[0] = new Planeta(200, 175, 0, -0.5, 30, 10);
      planete[1] = new Planeta(250, 175, 0, 25, 1, 10);
      planete[2] = new Planeta(350, 175, 0, 13, 1, 10);

   }

   public void pozUrmat() {
      for (int i = 0; i < NrPlanete - 1; ++i)
         for (int j = i + 1; j < NrPlanete; ++j) {
            double dx = planete[i].Px - planete[j].Px;
            double dy = planete[i].Py - planete[j].Py;
            double d2 = dx * dx + dy * dy;
            double f = F_SCALA * planete[i].masa * planete[j].masa /
d2;
            double d = Math.sqrt(d2);

            double a_d = f / planete[i].masa / d;
            planete[i].Vx -= a_d * dx;
            planete[i].Vy -= a_d * dy;

            a_d = f / planete[j].masa / d;
            planete[j].Vx += a_d * dx;
            planete[j].Vy += a_d * dy;
         }
      /*
      for(int i=0;i<NrPlanete;++i)
         System.out.println(planete[i]);
      */
   }

   public void paintComponent(Graphics g) {
      super.paintComponent(g);
      Graphics2D g2 = (Graphics2D)g;

      for (int i = 0; i < NrPlanete; ++i)
         g2.fill(planete[i].desenare(g2));
   }
}
```

Clasa fPlanete.java:

```
import java.awt.Dimension;
import java.awt.Rectangle;
import javax.swing.JFrame;

public class fPlanete extends JFrame {
    private jpPlaneta jpP = new jpPlaneta();

    public fPlanete() {
        try {
            jbInit();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }

    private void jbInit() throws Exception {
        this.getContentPane().setLayout(null);
        this.setSize(new Dimension(718, 518));
        this.setTitle("Miscarea planetelor.");
        jpP.setBounds(new Rectangle(5, 5, 720, 490));
        jpP.setLocation(0, 0);
        this.getContentPane().add(jpP, null);
    }

    public void miscaPlanete() {
        //pozitia initiala
        repaint();
        try {
            for (int i = 1; i <= 10000; i++) {
                jpP.pozUrmat();
                for (int j = 0; j < jpP.NrPlanete; ++j)
                    jpP.planete[j].misca();
                jpP.paint(jpP.getGraphics());
                Thread.sleep(20);
            }
        } catch (InterruptedException e) {
        }
    }

    public static void main(String[] args) {
        fPlanete frame = new fPlanete();

        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setVisible(true);
        frame.miscaPlanete();

    }
}
```


Miscarea planetelor.