Laporan Praktikum Modul 4

Bahasa Pemograman 1

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PRETEST

1. Apakah komponen AWT dan Swing dapat digunakan untuk membuat animasi 2D dan 3D?
    - Komponen **AWT** dan **Swing** dapat digunakan untuk membuat animasi 2D sederhana menggunakan kelas seperti `Graphics` dan `Graphics2D`. Namun, untuk animasi 3D, AWT dan Swing tidak ideal karena tidak memiliki dukungan bawaan untuk rendering 3D. Sebagai gantinya, Java menyediakan pustaka seperti **JavaFX** atau **JOGL** (Java OpenGL) untuk animasi 3D yang lebih kompleks dan efisien.

2. Buat program untuk penerapan jawaban NO.1 tersebut dalam java?
    - ```
      import javax.swing.*;
      import java.awt.*;

      public class AnimasiSederhana extends JPanel {
        private int x = 0; // Posisi horizontal
        private int deltaX = 5; // Kecepatan gerak

        public AnimasiSederhana() {
          Timer timer = new Timer(30, e -> {
            x += deltaX; // Gerakkan lingkaran
            if (x <= 0 || x >= getWidth() - 50) deltaX = -deltaX; // Pantul
            repaint(); // Perbarui tampilan
          });
          timer.start();
        }

        @Override
        protected void paintComponent(Graphics g) {
          super.paintComponent(g);
          g.setColor(Color.RED);
          g.fillOval(x, 100, 50, 50); // Gambar lingkaran
        }

        public static void main(String[] args) {
          JFrame frame = new JFrame("Animasi 2D");
          frame.add(new AnimasiSederhana());
          frame.setSize(400, 300);
          frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
          frame.setVisible(true);
        }
      }
      ```
      ```

PRAKTIKUM

1. Tuliskan source code berikut :

   Source code :

```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */

import java.awt.Color;
import java.awt.Dimension;
import java.awt.Graphics;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.util.ArrayList;
import java.util.List;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.SwingUtilities;
import javax.swing.Timer;

public class BP1_P1_M5 extends JPanel {
   private static final int L = 400, T = 400;
   List<Mobil> mobil1;
   public BP1_P1_M5() {
      setBackground(new Color(0, 0, 0));
      setLayout(null);
      mobil1 = new ArrayList();
      mobil1.add(new Mobil(100, 200));
      Timer timer = new Timer(50, new ActionListener(){
         @Override
         public void actionPerformed(ActionEvent e) {
            for (Mobil mobil : mobil1) {
               mobil.Bergerak();
               repaint();
            }
         }
      });
      timer.start();
   }


   protected  void paintComponent(Graphics g) {
      super.paintComponent(g);
      for (Mobil mobil : mobil1)
```

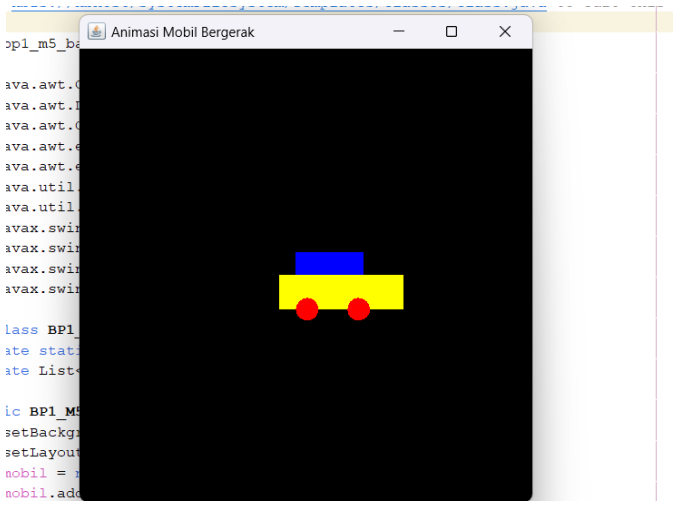
```
        { mobil.GambarMobil(g);}
    }

    public Dimension getPreferredSize() {
        return new Dimension(L, T);
    }

    public class Mobil {
        private static final int INCREMENT = 5;
        int x, y;
        public Mobil(int x, int y) {
            this.x = x;
            this.y = y;
        }
        public void GambarMobil(Graphics g){
            g.setColor(Color.BLUE);
            g.fillRect(x + 15, y - 12, 60, 35);
            g.setColor(Color.yellow);
            g.fillRect(x, y, 110, 30);
            g.setColor(Color.red);
            g.fillOval(x + 15, y + 20, 20, 20);
            g.fillOval(x + 60, y + 20, 20, 20);
        }

        public void Bergerak() {
            if (x == L) {
                x = 1;
            } else {
                x += INCREMENT;
            }
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            public void run() {
                JFrame frame = new JFrame();
                frame.getContentPane().add(new BP1_P1_M5());
                frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
                frame.setTitle("Animasi Mobil Bergerak");
                frame.pack();
                frame.setLocationRelativeTo(null);
                frame.setVisible(true);
            }
        });
    }
}
```



POSTEST

```
/*
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 */
package bp1_m5_bayu;

import java.awt.Color;
import java.awt.Dimension;
import java.awt.Graphics;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.util.ArrayList;
import java.util.List;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.SwingUtilities;
import javax.swing.Timer;

public class BP1_M5_PostTest_Bayu extends JPanel {
```

```
private static final int L = 400, T = 400;
private List<Bola> bola;

public BP1_M5_PostTest_Bayu() {
    setBackground(Color.BLACK);
    setLayout(null);
    bola = new ArrayList<>();
    bola.add(new Bola(200, 0));

    Timer timer = new Timer(50, new ActionListener() {
        @Override
        public void actionPerformed(ActionEvent e) {
            for (Bola b : bola) {
                b.Bergerak();
            }
            repaint();
        }
    });
    timer.start();
}

@Override
protected void paintComponent(Graphics g) {
    super.paintComponent(g);
    for (Bola b : bola) {
        b.GambarBola(g);
    }
}

@Override
public Dimension getPreferredSize() {
```

```
    return new Dimension(L, T);
}

private static class Bola {
    private static final int INCREMENT = 8; //kecepatan bola
    private int x, y;
    private static final int DIAMETER = 100; //ddiameter bola

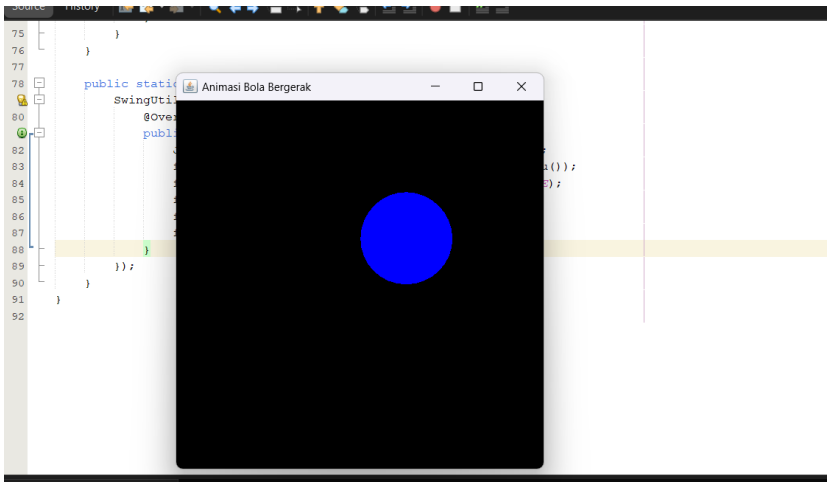
    public Bola(int x, int y) {
        this.x = x;
        this.y = y;
    }

    public void GambarBola(Graphics g) {
        g.setColor(Color.BLUE);
        g.fillOval(x, y, DIAMETER, DIAMETER);
    }

    public void Bergerak() {
        if (y >= T) {
            y = -DIAMETER;
        } else {
            y += INCREMENT;
        }
    }
}

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

```
            JFrame frame = new JFrame("Animasi Bola Bergerak");
            frame.getContentPane().add(new BP1_M5_PostTest_Bayu());
            frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
            frame.pack();
            frame.setLocationRelativeTo(null);
            frame.setVisible(true);
        }
    });
  }
}
```



Program ini membuat animasi lingkaran bergerak dari atas ke bawah

TUGAS

```
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 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package bp1_m5_bayu;

import java.awt.Color;
import java.awt.Dimension;
import java.awt.Graphics;
```

```
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.util.ArrayList;
import java.util.List;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.SwingUtilities;
import javax.swing.Timer;

public class BP1_M5_Tugas_Bayu extends JPanel {
    private static final int L = 400, T = 400;
    private List<Bola> bola;

    public BP1_M5_Tugas_Bayu() {
        setBackground(Color.BLACK);
        setLayout(null);
        bola = new ArrayList<>();
        bola.add(new Bola(0, 0, 9, 10)); //posisi awal bola dengan kecepatan awal

        Timer timer = new Timer(28, new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                for (Bola b : bola) {
                    b.Bergerak();
                }
                repaint();
            }
        });
        timer.start();
    }
```

```
@Override
protected void paintComponent(Graphics g) {
   super.paintComponent(g);
   for (Bola b : bola) {
      b.GambarBola(g);
   }
}

@Override
public Dimension getPreferredSize() {
   return new Dimension(L, T);
}

private static class Bola {
   private static final int DIAMETER = 50; //ukuran bola
   private int x, y;
   private int dx, dy;

   public Bola(int x, int y, int dx, int dy) {
      this.x = x;
      this.y = y;
      this.dx = dx;
      this.dy = dy;
   }

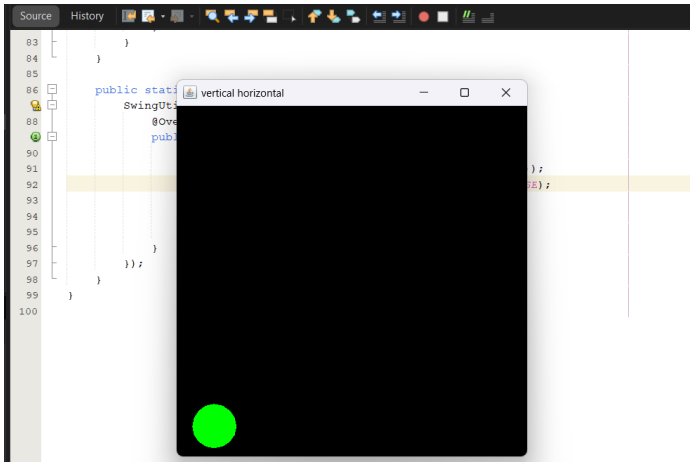
   public void GambarBola(Graphics g) {
      g.setColor(Color.GREEN);
      g.fillOval(x, y, DIAMETER, DIAMETER);
   }

   public void Bergerak() {
```

```
            //gerakan horizontal
            x += dx;
            if (x <= 0 || x + DIAMETER >= L) {
                dx = -dx;
            }

            //gerakan vertikal
            y += dy;
            if (y <= 0 || y + DIAMETER >= T) {
                dy = -dy;
            }
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            @Override
            public void run() {
                JFrame frame = new JFrame("vertical horizontal");
                frame.getContentPane().add(new BP1_M5_Tugas_Bayu());
                frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
                frame.pack();
                frame.setLocationRelativeTo(null);
                frame.setVisible(true);
            }
        });
    }
}
```


Source
History
vertical horizontal