MODUL VII

GRAFIS DAN OBJEK 2D

1. Tujuan

a. Mahasiswa mampu membuat objek grafis melalui pemrograman Java

b. Mahasiswa mampu menyelesaikan kasus objek 2D melalui koordinat kartesian dengan program Java

c. Mahasiswa mampu menerapkan konsep pemrograman objek untuk pembuatan objek 2D di program Java

2. Latihan praktikum

Buat file .java di editor masing-masing, dan lakukan latihan pemrograman yang ditunjukkan setiap nomor.

a. Kustomisasi warna

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

public class warnaJava extends JPanel
 {

 public void paintComponent( Graphics g )
 {
 super.paintComponent( g ); // panggil superclass paintComponent

 this.setBackground( Color.WHITE );

// contoh lengkap
g.setColor(new Color(255,0,0));
g.fillRect(15, 25, 100, 20);
 g.drawString( "Nilai RGB: "+ ,130, 40 );

 // tambahkan set color 0.50f, 0.75f, dan 0.0f
 g.fillRect( 15, 50, 100, 20 );
 g.drawString( "Nilai RGB: "+ ,130, 65 );

 // tambahkan set warna biru (konstanta)
 g.fillRect( 15, 75, 100, 20 );
 g.drawString( "Nilai RGB: " + g.getColor(), 130, 90 );


Color color = Color.MAGENTA;
g.setColor(color);
 g.fillRect( 15, 100, 100, 20 );
 g.drawString( "RGB: "+ +", " +
 + ", "+ ,130, 115 );
 }
 }
```

```
import javax.swing.JFrame;

public class tampilWarna
 {

 public static void main( String args[] )
 {
 // buat frame untuk ColorJPanel
 JFrame frame = new JFrame( "Pilihan Warna" );
 frame.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );

 ColorJPanel colorJPanel = new ColorJPanel(); // buat ColorJPanel
 frame.add( colorJPanel ); // tambahkan colorJPanel ke frame
 frame.setSize( 400, 180 ); // set frame size
 frame.setVisible( true ); // tampilkan frame
 }
 }
```

b. Pilih Warna Melali Skema Chooser

```
   import java.awt.BorderLayout;
    import java.awt.Color;
    import java.awt.event.ActionEvent;
    import java.awt.event.ActionListener;
    import javax.swing.JButton;
    import javax.swing.JFrame;

    import javax.swing.JPanel;

    public class pilihWarnaJava extends JFrame
    {
    private JButton changeColorJButton;
    private Color color = Color.LIGHT_GRAY;
    private JPanel colorJPanel;


    public ShowColors2JFrame()
    {
    super( "Penggunaan JColorChooser" );


    colorJPanel = new JPanel();
    colorJPanel.setBackground( color );


    changeColorJButton = new JButton( "Ubah Warna" );
    changeColorJButton.addActionListener(
    new ActionListener()
    {
      public void actionPerformed( ActionEvent event )
   {
     color = JColorChooser.showDialog(
   ShowColors2JFrame.this, "Pilih warna", color );

    if ( color == null )
    color = Color.LIGHT_GRAY;

    }
    }
    );
```

```
     add( colorJPanel, BorderLayout.CENTER ); // tampilkan colorJPanel
     add( changeColorJButton, BorderLayout.SOUTH ); // tampilkan button

     setSize( 400, 130 ); // set frame size
     setVisible( true ); // tampilkan frame
     }
     }
```

```
import javax.swing.JFrame;

public class tesPilihWarnaJava
 {

 public static void main( String args[] )
 {
 ShowColors2JFrame application = new ShowColors2JFrame();
 application.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );
 }
 }
```

c. Kustomisasi Font

```
    import java.awt.Font;
    import java.awt.Color;
     import java.awt.Graphics;
     import javax.swing.JPanel;

    public class kustomisasiFont extends JPanel
     {

     public void paintComponent( Graphics g )
     {
     super.paintComponent( g );


    g.setFont( new Font( "Serif", Font.BOLD, 12 ) );
     g.drawString( "Serif 12 point bold.", 20, 50 );

     g.setFont( new Font( "Monospaced", Font.ITALIC, 24 ) );
     g.drawString( "Monospaced 24 point italic.", 20, 70 );

     g.setFont( new Font( "SansSerif", Font.PLAIN, 14 ) );
     g.drawString( "SansSerif 14 point plain.", 20, 90 );


     g.setColor( Color.RED );
    g.setFont( new Font( "Serif", Font.BOLD + Font.ITALIC, 18 ) );
     g.drawString( + " "+ +
     " point bold italic.", 20, 110 );
     }
     }
```

```
import javax.swing.JFrame;

public class Fonts
 {

 public static void main( String args[] )
```

```
 {

 JFrame frame = new JFrame( "Penggunaan Font" );
 frame.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );

 FontJPanel fontJPanel = new FontJPanel();
 frame.add( fontJPanel );
 frame.setSize( 420, 170 );
 frame.setVisible( true );
 }
 }
```

d. Font Metrics

```
   import java.awt.Font;
   import java.awt.FontMetrics;
   import java.awt.Graphics;
   import javax.swing.JPanel;

   public class fntMetrics extends JPanel{
     public void paintComponent( Graphics g )
    {
    super.paintComponent( g );

    g.setFont( new Font( "SansSerif", Font.BOLD, 12 ) );
    FontMetrics metrics = g.getFontMetrics();
    //tambahkan method getFont(), getAscent(), getDescent(), getHeight(), dan
   getLeading() sesuai penggunaan secara tepat
    g.drawString( "Font: "+ g.getFont() ,10, 40 );
    g.drawString( "Ascent: "+ ,10, 55 );
    g.drawString( "Descent: "+ ,10, 70 );
    g.drawString( "Height: "+ ,10, 85 );
    g.drawString( "Leading: "+ ,10, 100 );

   //tambahkan method getFont(), getAscent(), getDescent(), getHeight(), dan
   getLeading() sesuai penggunaan secara tepat
    Font font = new Font( "Serif", Font.ITALIC, 14 );
    metrics = g.getFontMetrics(font);
    g.setFont( font );
    g.drawString( "Font : " + font, 10, 130 );
    g.drawString( "Ascent: "+ ,10, 145 );
    g.drawString( "Descent: "+ ,10, 160 );
    g.drawString( "Height: "+ ,10, 175 );
    g.drawString( "Leading: "+ ,10, 190 );
    } // end method paintComponent
    } //

   }
```

```
import javax.swing.JFrame;

public class tesFntMetrics
 {

 public static void main( String args[] )
 {

 JFrame frame = new JFrame( "Contoh Implementasi FontMetrics" );
 frame.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );
```

```
MetricsJPanel metricsJPanel = new MetricsJPanel();
frame.add( metricsJPanel );
frame.setSize( 510, 250 );
frame.setVisible( true );
}
}
```

e. Objek 2D Sederhana

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

public class LinesRectsOvalsJPanel extends JPanel
 {

 public void paintComponent( Graphics g )
 {
 super.paintComponent( g );

 this.setBackground( Color.WHITE );
 g.setColor( Color.RED );
 //  garis dengan parameter (5, 30, 380, 30)


 g.setColor( Color.BLUE );
 //  drawRect dengan parameter (5, 40, 90, 55)
 //  fillRect dengan parameter (100, 40, 90, 55)

 g.setColor( Color.CYAN );
 //  fillRoundRect dengan parameter (195, 40, 90, 55, 50, 50)
 //  drawRoundRect dengan parameter (5, 30, 380, 30)

 g.setColor( Color.YELLOW );
 //  draw3DRect dengan parameter (5, 100, 90, 55, true)
 //  fill3DRect dengan parameter (100, 100, 90, 55, false)

 g.setColor( Color.MAGENTA );
 //  drawOval dengan parameter (195, 100, 90, 55)
 //  fillOval dengan parameter (290, 100, 90, 55)


 }
 }
```

```
import java.awt.Color;
 import javax.swing.JFrame;

public class tesObjek2DSederhana
 {

 public static void main( String args[] )
 {

 JFrame frame =
 new JFrame( "Gambar Objek Garis, Persegi Panjang, dan Oval" );
 frame.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );
 LinesRectsOvalsJPanel linesRectsOvalsJPanel =
```

```
 new LinesRectsOvalsJPanel();
 linesRectsOvalsJPanel.setBackground( Color.WHITE );
 frame.add( linesRectsOvalsJPanel );
 frame.setSize( 400, 210 );
 frame.setVisible( true );
 }
 }
```

f. Objek Arc

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

   public class objekArc extends JPanel
    {
        // draw rectangles and arcs
          public void paintComponent( Graphics g )
          {
               super.paintComponent( g ); // call superclass's paintComponent

               // start at 0 and sweep 360 degrees
               g.setColor( Color.RED );
               g.drawRect( 15, 35, 80, 80 );
               g.setColor( Color.BLACK );
               // tambahkan drawArc dengan parameter x bernilai 15, y bernilai 35,
               width bernilai 80, height bernilai 80, 0 derajat sebagai sudut awal, dan
               360 derjata sebagai set sudut


               // start at 0 and sweep 110 degrees
               g.setColor( Color.RED );
               g.drawRect( 100, 35, 80, 80 );
               g.setColor( Color.BLACK );
               g.drawArc( 100, 35, 80, 80, 0, 110 );

              g.setColor( Color.RED );
              g.drawRect( 185, 35, 80, 80 );
              g.setColor( Color.BLACK );
              g.drawArc( 185, 35, 80, 80, 0, -270 );


              g.fillArc( 15, 120, 80, 40, 0, 360 );

              g.fillArc( 100, 120, 80, 40, 270, -90 );

              g.fillArc( 185, 120, 80, 40, 0, -270 );
```

```
import javax.swing.JFrame;

public class tesObjekArc
 {

 public static void main( String args[] )
 {

 JFrame frame = new JFrame( "Objek Arc Dari Berbagai Contoh Sudut" );
 frame.setDefaultCloseOperation( JFrame.EXIT_ON_CLOSE );
```

```
ArcsJPanel arcsJPanel = new ArcsJPanel(); // create ArcsJPanel
frame.add( arcsJPanel ); // add arcsJPanel to frame
frame.setSize( 300, 210 ); // set frame size
frame.setVisible( true ); // display frame
} // end main
}
```

3. Tugas Praktikum

1) Buat bentuk objek segitiga dan poligon tak beraturan (minimal empat sudut) dengan mengimplementasikan teknik polimorfisme!