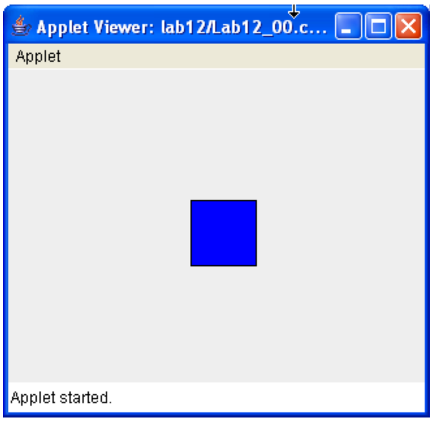
บทที่ 12 การใช้งาน Mouse และ Keyboard

การใช้งาน MouseListener และ MouseEvent ในการตรวจสอบการคลิกเมาส์ในตำแหน่งของวัตถุที่ต้องการ

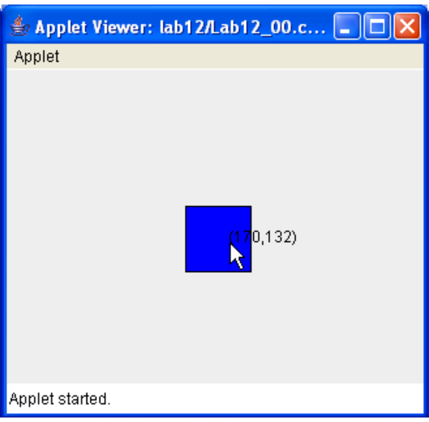
การทดลองที่ 12-1

```
// File Name : Lab12_01.java

import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class Lab12_01 extends JApplet implements MouseListener {
    int x, y, size;
    Color bgcolor, fgcolor;
    boolean isDraw = true;

    public void init () {
        super.init();
        x = 140;
        y = 100;
        size = 50;
        fgcolor = Color.BLUE;
        addMouseListener(this);
    }

    public void paint(Graphics g) {
        super.paint(g);
        if (isDraw == true) {
            g.setColor(fgcolor);
            g.fillRect( x, y, size , size);
            g.setColor( Color.BLACK );
            g.drawRect( x, y, size, size);
        }
    }

    public void mousePressed(MouseEvent event) {
        Graphics g = getGraphics();
        g.drawString("("+event.getX()+","+event.getY()+")",
                      event.getX(), event.getY());
    }

    public void mouseReleased(MouseEvent event) {
        repaint();
    }

    public void mouseClicked(MouseEvent event) {
        booleanflag = isInside(x,y,size,event.getX(),event.getY());

        if (isDraw == true) {
            if (flag == true) isDraw = !isDraw;
        }
        else {
            x = event.getX();
            y = event.getY();
            isDraw = !isDraw;
        }
    }

    public void mouseEntered( MouseEvent event ) {
        repaint();
    }

    public void mouseExited(MouseEvent event) {
        repaint();
    }

    boolean isInside(int x1,int y1,int size,int posx,int posy) {
        int x2 = x1 + size;
        int y2 = y1 + size;

        if (posx >= x1 && posx <= x2)
            if (posy >= y1 && posy <= y2) return true;
        return false;
    }

}
```

ผลลัพธ์

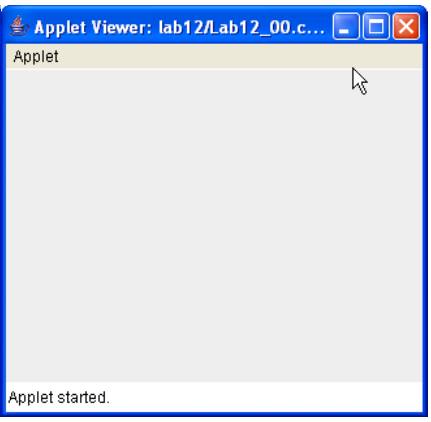


Applet started.

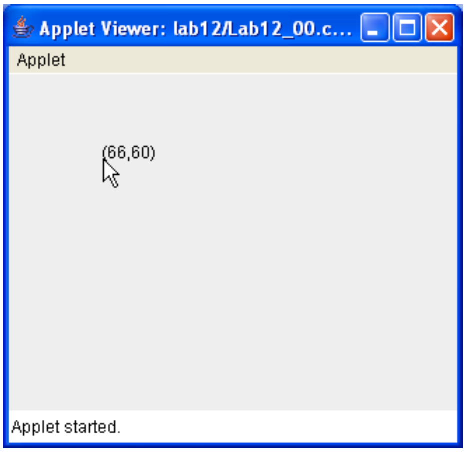


(170,132)

Applet started.

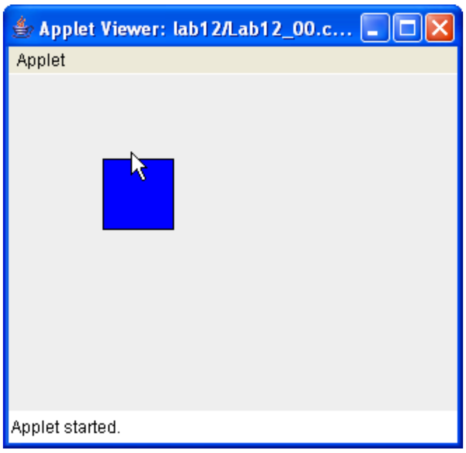


Applet started.



(66,60)

Applet started.



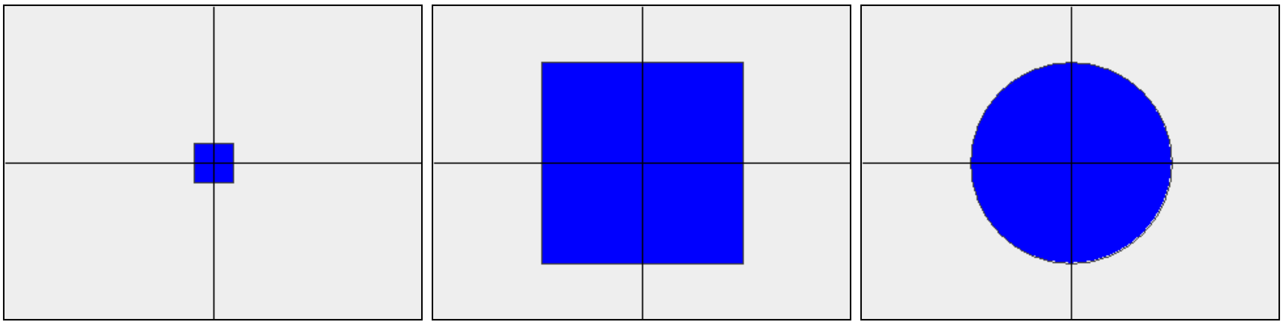
Applet started.

การใช้งาน MouseListener และ KeyListener กับโปรแกรม Java Application

การทดลองที่ 12-2

```
// File Name : Lab12_02.java
import java.applet.*;
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;

public class Lab12_02 extends JApplet implements KeyListener,
MouseListener  {
    private int x, y, size, xCenter, yCenter;
    private int width, height;
    private char typeShape = 'R';

    public Lab12_02() {
        width = 320;
        height = 240;
        xCenter = 160;
        yCenter = 120;
        size = 30;
        x = (width/2) - (size/2);
        y = (height/2) - (size/2);
        addKeyListener( this );
        addMouseListener( this );
    }

    public void paint(Graphics g) {
        super.paint(g);
        g.setColor(Color.BLUE);
        if (typeShape == 'R') {
            g.fillRect( x, y, size , size);
            g.setColor( Color.DARK_GRAY );
            g.drawRect( x, y, size, size);
        }
        else {
            g.fillOval( x, y, size , size);
            g.setColor( Color.DARK_GRAY );
            g.drawOval( x, y, size, size);
        }
        g.setColor(Color.BLACK);
        g.drawLine(1, yCenter,319, yCenter);
        g.drawLine(xCenter, 30,xCenter,239);
    }

    public void mousePressed(MouseEvent event) {
        Graphics g = getGraphics();
        g.drawString(""+ getSize( xCenter, event.getX() ),
                    event.getX(), event.getY()  );
    }

    public void mouseReleased(MouseEvent event) {
        repaint();
    }

    public void mouseClicked(MouseEvent event) {
        this.size = getSize(xCenter, event.getX());
        this.x = (width/2) - (size/2);
        this.y = (height/2) - (size/2);
        System.out.println(x + " , "+ y);
    }

    public void mouseEntered( MouseEvent event ) {  }

    public void mouseExited(MouseEvent event) {  }

    public void keyPressed(KeyEvent event) {
        if ( event.getKeyChar() == 'c')  typeShape = 'C';
        if ( event.getKeyChar() == 'r')  typeShape = 'R';
    }

    public void keyReleased(KeyEvent event) {
        repaint();
    }

    public void keyTyped(KeyEvent event) {  }

    private int getSize(int xCenter, int x) {
        int size = Math.abs ( xCenter  - x) * 2;
        return size;
    }

    public void init( ) {
        Lab12_02  window = new Lab12_02();
    }
}
```

ผลลัพธ์

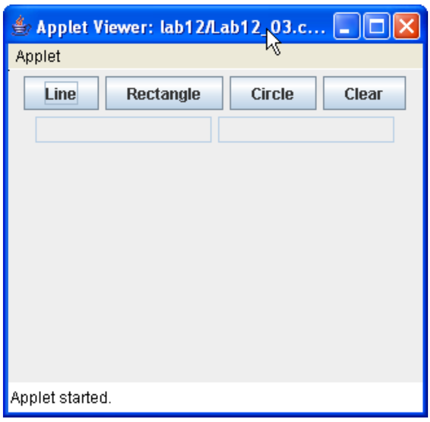


การใช้งาน MouseListener และ ActionListener กับโปรแกรมแบบ Applet

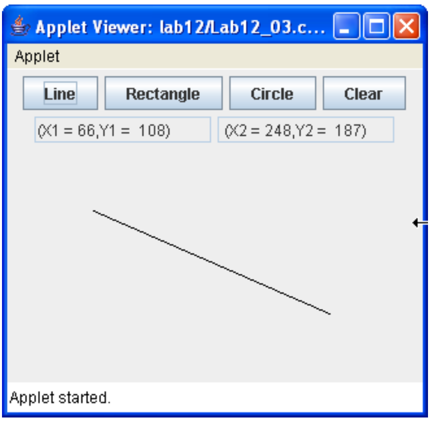
การทดลองที่ 12-03

```
// File Name : Lab12_03.java

import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

public class Lab12_03 extends JApplet implements ActionListener,
MouseListener {
    int x1, y1, x2,y2;
    JButton btnLine, btnRect, btnCircle, btnClear;
    JTextField text1, text2;
    Color oldColor1, oldColor2;
    char typeShape = 'L';

    public void init () {
        super.init();
        Container c = getContentPane();
        c.setLayout( new FlowLayout() );
        btnLine = new JButton("Line");
        btnLine.addActionListener( this );
        c.add(btnLine);
        btnRect = new JButton("Rectangle");
        btnRect.addActionListener( this );
        c.add(btnRect);

        btnCircle = new JButton("Circle");
        btnCircle.addActionListener( this );
        c.add(btnCircle);

        btnClear = new JButton("Clear");
        btnClear.addActionListener( this );
        c.add(btnClear);

        text1 = new JTextField(12);
        text1.setEditable( false );
        c.add( text1 );

        text2 = new JTextField(12);
        text2.setEditable( false );
        c.add( text2 );

        addMouseListener(this);
        setSize(320, 240);
    }

    public void paint(Graphics g) {
        super.paint(g);
        switch (typeShape) {
            case 'L' :
                g.drawLine(x1, y1, x2, y2);
                break;
            case 'R' :
                g.drawRect(x1, y1, x2-x1, y2-y1);
                break;
            case 'C' :
                g.drawOval(x1, y1, x2-x1, y2-y1);
                break;
        }
    }

    public void mousePressed(MouseEvent event) {
        if (event.getButton() == 1) { // Mouse Left
            x1 = event.getX();
            y1 = event.getY();
            text1.setText("(X1 = "+x1+",Y1 =  "+y1+")" );
        }
        else if (event.getButton() == 3) {  // Mouse Right
            x2 = event.getX();
            y2 = event.getY();
            text2.setText(" (X2 = "+x2+",Y2 =  "+y2+")" );
        }
    }

    public void mouseReleased(MouseEvent event) {  }
    public void mouseClicked(MouseEvent event) {
        repaint();
    }

    public void mouseEntered( MouseEvent event ) {
        repaint();
    }

    public void mouseExited(MouseEvent event) {
        repaint();
    }

    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == btnLine) typeShape = 'L';
        else if (e.getSource() == btnRect) typeShape = 'R';
        else if (e.getSource() == btnCircle) typeShape = 'C';
        else if (e.getSource() == btnClear) {
            x1 = y1 = x2 = y2 = 0;
            text1.setText("");
            text2.setText("");
        }
        repaint();
    }

}
```

ผลลัพธ์

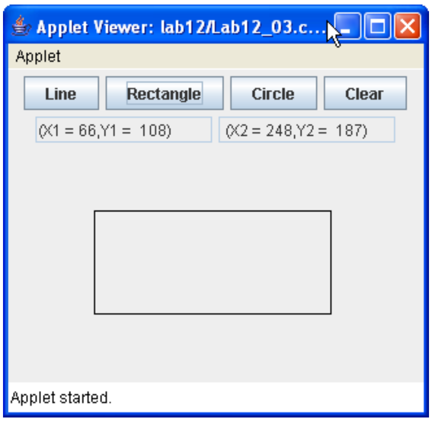


Applet started.



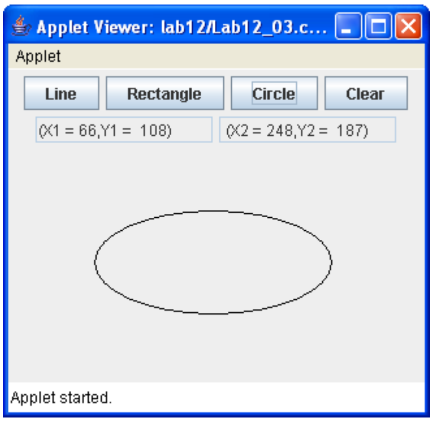
(X1 = 66,Y1 = 108) (X2 = 248,Y2 = 187)

Applet started.



(X1 = 66,Y1 = 108) (X2 = 248,Y2 = 187)

Applet started.



(X1 = 66,Y1 = 108) (X2 = 248,Y2 = 187)

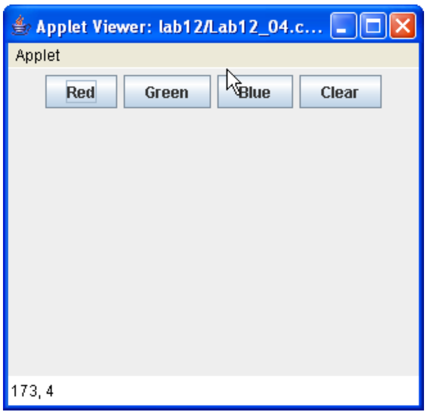
Applet started.

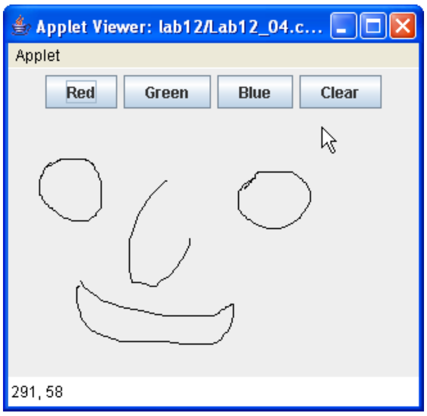
การใช้งาน MouseMontionListener ซึ่งมีเมธอด mouseDragged และ mouseMoved ในการรับเหตุการณ์

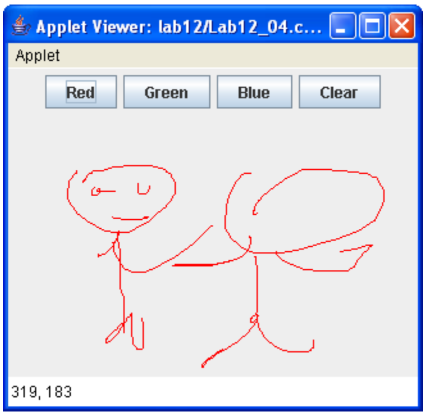
การทดลองที่ 12-04

```
// File Name : Lab12_04.java

import java.applet.*;
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;

public class Lab12_04 extends JApplet implements ActionListener,
MouseListener, MouseMotionListener{
    private int lastx, lasty;
    private JButton redBtn, greenBtn, blueBtn,clearBtn;
    private Graphics g;
    private Color color;

    public void init() {
        Container c = getContentPane();
        c.setLayout(new FlowLayout());
        redBtn = new JButton("Red");
        redBtn.addActionListener(this);
        c.add(redBtn);

        greenBtn = new JButton("Green");
        greenBtn.addActionListener(this);
        c.add(greenBtn);

        blueBtn = new JButton("Blue");
        blueBtn.addActionListener(this);
        c.add(blueBtn);

        clearBtn = new JButton("Clear");
        clearBtn.addActionListener(this);
        c.add(clearBtn);

        g = getGraphics();
        color = Color.BLACK;
        addMouseListener(this);
        addMouseMotionListener(this);
        setSize(320, 240);
    }

    public void paint(Graphics g) {
        super.paint(g);
    }
    public void mousePressed(MouseEvent event) {
        lastx = event.getX();
        lasty = event.getY();
    }

    public void mouseReleased(MouseEvent event) {  }

    public void mouseClicked(MouseEvent event) {  }

    public void mouseEntered( MouseEvent event ) {  }

    public void mouseExited(MouseEvent event) {  }

    public void mouseDragged(MouseEvent event) {
        int x =  event.getX();
        int y =  event.getY();
        g.setColor( color );
        g.drawLine(lastx, lasty, x, y);
        lastx = x;
        lasty = y;
    }

    public void mouseMoved(MouseEvent event) {
        showStatus(event.getX() + ", " + event.getY() );
    }

    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == redBtn) color = Color.RED;
        else if (e.getSource() == greenBtn) color = Color.GREEN;
        else if (e.getSource() == blueBtn) color = Color.BLUE;
        else if (e.getSource() == clearBtn) {
            color = Color.BLACK;
            clear();
        }
    }

    public void clear() {
        repaint();
        g.setColor(this.getBackground());
        g.fillRect(0, 0, bounds().width, bounds().height );
    }

}
```

ผลลัพธ์







การสร้างโปรแกรมแบบ Java Application ทำงานกับ KeyListener และ Timer

การทดลองที่ 12-05

```
// File Name : Lab12_05.java

import java.applet.*;
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;

public class Lab12_05 extends JApplet implements KeyListener,
ActionListener  {
    private int width, height;
    private JButton startBtn, stopBtn;
    private int xMin, xMax, yMin, yMax;
    private int x, y, size, xSpeed, ySpeed;
    Timer swTimer;

    public Lab12_05() {
        Container c = getContentPane();
        c.setLayout(new FlowLayout());

        startBtn = new JButton("Play");
        startBtn.addActionListener(this);
        startBtn.addKeyListener(this);
        c.add(startBtn);

        stopBtn = new JButton("Stop");
        stopBtn.addActionListener(this);
        stopBtn.addKeyListener(this);
        c.add(stopBtn);

        width = 480;    height = 320;
        xMin = 1;        xMax = 478;
        yMin = 30;      yMax = 319;
        xSpeed = 2;    ySpeed = 2;
        x = 240; y = 160;  size = 40;
        swTimer = new Timer(10, this);
    }

    public void paint(Graphics g) {
        super.paint(g);
        g.setColor( Color.BLACK );
        g.drawRect( 4, 30, 471, 285);
        g.setColor( Color.BLUE );
        g.fillOval( x, y, size, size);
    }

    public void keyPressed(KeyEvent event) {
        if ( event.getKeyChar() == 'p')
            swTimer.start();
        else if ( event.getKeyChar() == 's')
            swTimer.stop();
    }

    public void keyReleased(KeyEvent event) { }

    public void keyTyped(KeyEvent event) {  }

    public void actionPerformed(ActionEvent e) {
        if (e.getSource() == startBtn)  swTimer.start();
        else if (e.getSource() == stopBtn) swTimer.stop();
        else {
            move();
            repaint();
        }
    }

    public void move() {
        x = x + xSpeed;
        y = y + ySpeed;
        if (x < xMin) {
            x = xMin;
            xSpeed = -xSpeed;
        }
        else if (x+size > xMax) {
            x = xMax - size;
            xSpeed = -xSpeed;
        }
        if (y < yMin) {
            y = yMin;
            ySpeed = -ySpeed;
        }
        else if (y+size > yMax) {
            y = yMax - size;
            ySpeed = -ySpeed;
        }
    }

    public static void main(String[] args) {
        Lab12_05  window = new Lab12_05();
    }
}
```

ผลลัพธ์