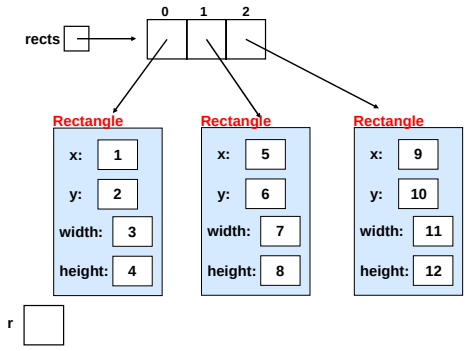
Lecture 29

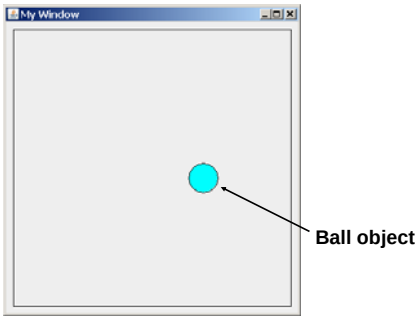
Assignment Discussion

```
Rectangle[] rects = new Rectangle[3];

rects[0] = new Rectangle(1, 2, 3, 4);
rects[1] = new Rectangle(5, 6, 7, 8);
rects[2] = new Rectangle(9, 10, 11, 12);

Rectangle r = rects[0];

r.x = 13;
r.y = 14;

rects[0] = rects[1];
rects[1] = rects[2];
rects[2] = r;

System.out.println(rects[0].x + " , " + rects[0].y);
System.out.println(rects[1].x + " , " + rects[1].y);
System.out.println(rects[2].x + " , " + rects[2].y);
```

Point object exercise



Using a boundary




```
public class Ball {

	private int x, y;
	private int xSpeed, ySpeed;

	public Ball() {
		x = 200;
		y = 200;
		xSpeed = (int)(Math.random() * 11) - 5;
		ySpeed = (int)(Math.random() * 11) - 5;
	}

	public void move() {
		x += xSpeed;
		y += ySpeed;
	}

	public void draw(Graphics g) {
		g.setColor(Color.cyan);
		g.fillOval(x-20, y-20, 40, 40);
		g.setColor(Color.black);
		g.drawOval(x-20, y-20, 40, 40);
	}
}
```

initialises the position and speeds

updates the position

draws at the current position

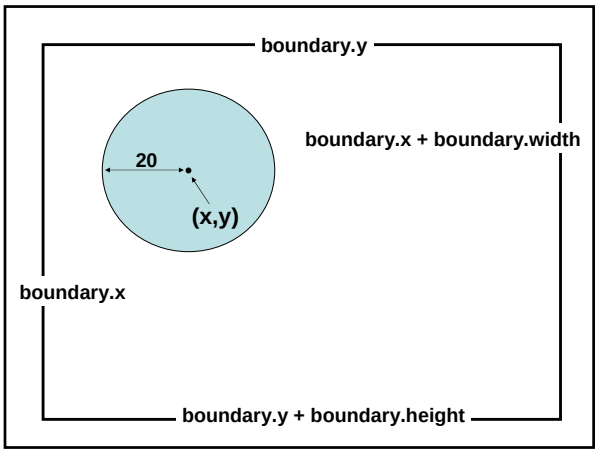
```
public class MyJPanel extends JPanel implements ActionListener {

	private Rectangle boundary;
	private Ball ball;
	private Timer t;

	public MyJPanel() {
		boundary = new Rectangle(10, 10, 380, 380);
		ball = new Ball();

		t = new Timer(25, this);
		t.start();
	}

	public void actionPerformed(ActionEvent e) {
		ball.move();
		repaint();
	}

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

		ball.draw(g);
		g.drawRect(boundary.x, boundary.y, boundary.width,
				boundary.height);
	}
}
```

declare instance variables

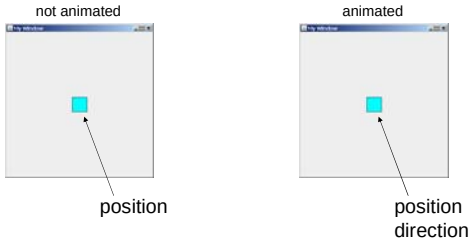
initialise instance variables

update instance variables

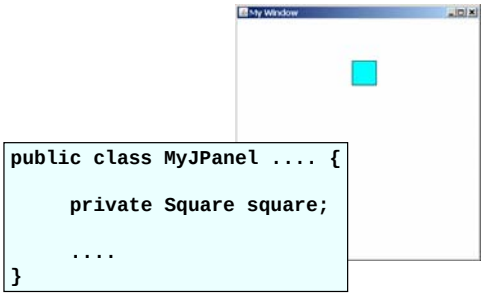
draw based on instance variables



Controlling a moving object

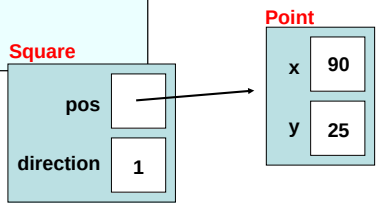


Controlling a moving object



Controlling a moving object

```
public class Square .... {

     private Point pos;
     private int direction;

     ....
}
```



The Square class

```
public class Square .... {

     private Point pos;
     private int direction;

     public Square(int x, int y) ....

     public void draw(Graphics g) ....

     public void move() ....

     public void turnLeft() ....
     public void turnRight() ....
     public void turnUp() ....
     public void turnDown() ....
}
```

initialises the position and direction

draws at the current position

updates the position

updates the direction

```
public class MyJPanel extends JPanel ....  {
     private Square square;
     public MyJPanel() {
          square = new Square(200, 200);
     }
     public void keyPressed(KeyEvent e) {

     }
     public void actionPerformed(ActionEvent e) {

     }
     public void paintComponent(Graphics g){
          super.paintComponent(g);
          square.draw(g);
     }
}
```

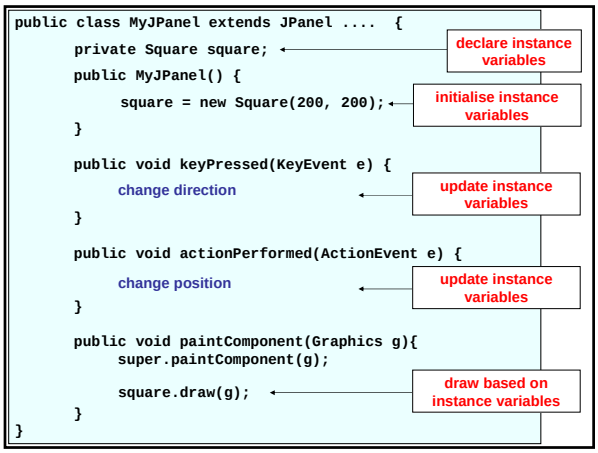
declare instance variables

initialise instance variables

update instance variables

update instance variables

draw based on instance variables


public class MyJPanel extends JPanel .... {
private Square square;
public MyJPanel() {
square = new Square(200, 200);
}
public void keyPressed(KeyEvent e) {
change direction
}
public void actionPerformed(ActionEvent e) {
change position
}
public void paintComponent(Graphics g){
super.paintComponent(g);
square.draw(g);
}
}
declare instance variables
initialise instance variables
update instance variables
update instance variables
draw based on instance variables