



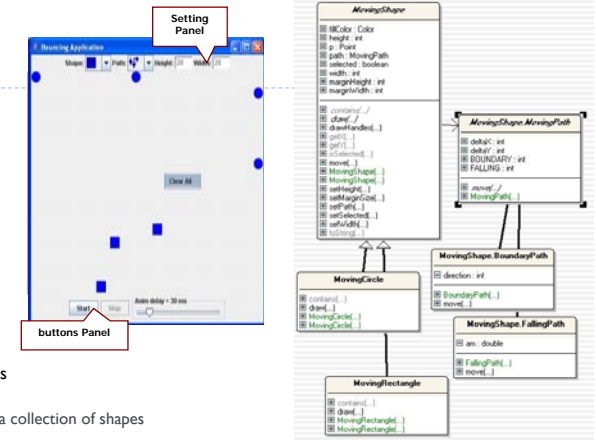
COMPSCI230S2C 2013 Software Construction

Assignment 2



A2

- ▶ A2:
 - ▶ JFrame contains
 - ▶ an animation Panel
 - ▶ a setting panel
 - ▶ a buttons panel
 - ▶ ...
 - ▶ The Setting Panel contains
 - ▶ 2 combo boxes
 - ▶ 2 textboxes
 - ▶ The Buttons Panel contains
 - ▶ Start and stop buttons
 - ▶ A Slider
 - ▶ The Animation Panel contains
 - ▶ A popup menu
 - ▶ An ArrayList which stores a collection of shapes
 - ▶ Current values for:
 - ▶ Current shapeType (0 for rectangle, 1 for square, 2 for triangle, etc – index of the shape combo box)
 - ▶ Current pathType (0 for boundary path, 1 for falling path – index of the path combo box)
 - ▶ currentWidth, currentHeight, etc

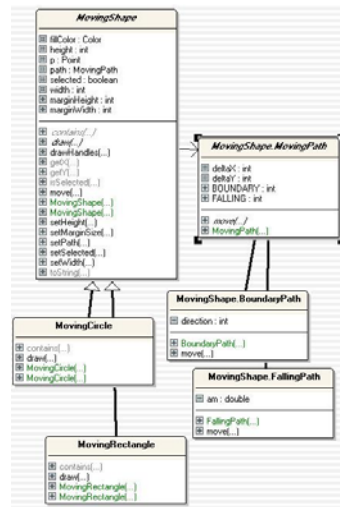


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MovingShape

- ▶ MovingShape - Superclass:
 - ▶ Defines general fields and methods
 - ▶ Fields:
 - ▶ Position of the shape (point p)
 - ▶ Width and height
 - ▶ fillColor and BorderColor (your task)
 - ▶ Selected (boolean)
 - ▶ marginHeight, marginwidth (size of the frame)
 - ▶ ...
 - ▶ Methods:
 - ▶ getX(), getY()
 - ▶ setWidth(...), setHeight(...)
 - ▶ setSelected(...), isSelected()
 - ▶ ...
- ▶ Subclasses:
 - ▶ MovingRectangle, MovingSquare, Moving...
 - ▶ Define specific fields and methods
 - ▶ Methods:
 - ▶ constructors
 - ▶ draw(...)
 - ▶ contains(...)

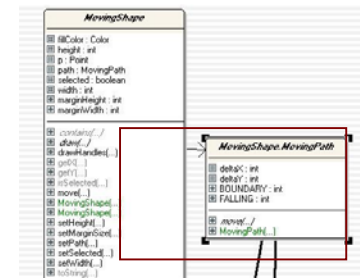


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MovingShape & MovingPath

- ▶ MovingShape:
 - ▶ Has a moving path
 - ▶ MovingPath is an Inner class of MovingShape
 - ▶ can access and change all fields of its outer class
 - ▶ change the position of a shape
- ▶ MovingPath – Superclass
 - ▶ Fields: deltaX, deltaY (distance move in x/y direction each step)
 - ▶ Subclasses:
 - ▶ BoundaryPath and FallingPath
 - ▶ Specific method
 - Move



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Event Flow

- ▶ Adding a new shape: mouse click on AnimationPanel
 - ▶ mouseClicked
 - ▶ If not selected
 - createNewShape(e.getX(), e.getY()) – at mouse point
 - Get all default values: shape, path, width, height, color, etc
 - Create a new instance and add it to the shapes list
 - ▶ If selected
 - Set the selected boolean to true
- ▶ Animation:
 - ▶ animationThread.start()
 - ▶ execute run()
 - ▶ execute repaint()
 - ▶ execute paintComponent()
 - ▶ Loop through the shapes list and execute the move() and draw() method
 - move() of the MovingShape
 - Call path.move of a path
 - Change the p.x and p.y position
 - draw() of the MovingShape
 - Call draw method of an instance of subclass
 - Draw the shape and handles if selected

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2. Restructuring

- ▶ Think about the structure –
 - ▶ MovingSquare extends _____
 - ▶ Do need to implement all abstract methods?
 - ▶ Draw?
 - ▶ Contains?
 - ▶ How many arguments are required to define a square?
 - ▶ Is square a special kind of Rectangle?
- ▶ What will happen when the user change height/width only?

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3: Border & Fill Colours

- ▶ MovingShape
 - ▶ Add variables and get/set methods
 - ▶ Modify the constructor
- ▶ Subclasses
 - ▶ Modify the constructor
 - ▶ Modify the draw method
- ▶ AnimationPanel
 - ▶ Add variables and methods to store the current fill/border colour in the panel
- ▶ A2
 - ▶ Add two buttons in the setting/buttons panel
 - ▶ Event Handling
 - ▶ Add a color chooser for users to select the fillColour /borderColor
 - ▶ Start a ColorChooser
 - When the user has selected a colour,
 - change the _____/_____ color of the button
 - Set the default _____/_____ Color
 - When the user cancels the action, the default colour is remain unchanged

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4. MovingMessage

- ▶ Create a new Class
 - ▶ Extends _____
 - ▶ Create constructors
 - ▶ Do you need to store additional fields?
 - ▶ Do you need to add additional methods?
 - ▶ Do you need to override any methods in the super class?
 - ▶ What do you want to draw?
 - ▶ Do you need to implement the contains method?
- ▶ AnimationPanel
 - ▶ Modify the _____ method to create a new instance
- ▶ A2
 - ▶ Add an imageButton to the shapes combo box
 - ▶ Add a text field and event handler for users to enter a message

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Centering Display Using the FontMetrics Class

- ▶ You can display a string at any location in a panel. Can you display it centered? To do so, you need to use the FontMetrics class to measure the exact width and height of the string for a particular font. A FontMetrics can measure the following attributes:

- public int getAscent()
- public int getDescent()
- public int getLeading()
- public int getHeight()
- public int stringWidth(String str)



The FontMetrics Class

- ▶ FontMetrics is an abstract class. To get a FontMetrics object for a specific font, use the following getFontMetrics methods defined in the Graphics class:

- ▶ public FontMetrics getFontMetrics(Font f)
 - ▶ Returns the font metrics of the specified font.
 - ▶ Example: g.getFontMetrics(font);
- ▶ public FontMetrics getFontMetrics()
 - ▶ Returns the font metrics of the current font.

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4. Moving Outline

- ▶ Create a new Class
 - ▶ Extends _____
 - ▶ Create constructors
 - ▶ Do you need to store additional fields?
 - ▶ Do you need to add additional methods?
 - ▶ Do you need to override any methods in the super class?
 - ▶ What do you want to draw?
 - ▶ Do you need to implement the contains method?
- ▶ AnimationPanel
 - ▶ Modify the _____ method to create a new instance
- ▶ A2
 - ▶ Add an imageButton to the shapes combo box
 - ▶ Add a text field/slider and event handler for users to adjust the line width

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Stroke

- ▶ In AWT, could only do 1-pixel wide lines, no control over how lines are joined
- ▶ Much more flexibility in Java2D – can specify:
 - ▶ Pen thickness
 - ▶ Dashing pattern
 - ▶ The way line segments are joined together
- ▶ Create a BasicStroke object (several constructors)
 - ▶ Stroke l = new BasicStroke (1.0f); // basic one
 - ▶ Graphics2D g2 = (Graphics2D) g;
float dash[] = { 10.0f };
g2.setStroke(**new** BasicStroke(3.0f, BasicStroke.CAP_BUTT, BasicStroke.JOIN_MITER, 10.0f, dash, 0.0f));

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5.Path

- ▶ **MovingStairs / your own designed path**

- ▶ Create a new member inner class
- ▶ Extends _____
- ▶ Create constructors
- ▶ Do you need to store additional field?
- ▶ Do you need to override any methods in the super class?

- ▶ **MovingShape**

- ▶ Modify the _____ method to create a new instance

- ▶ **A2**

- ▶ Add an imageButton to the path combo box