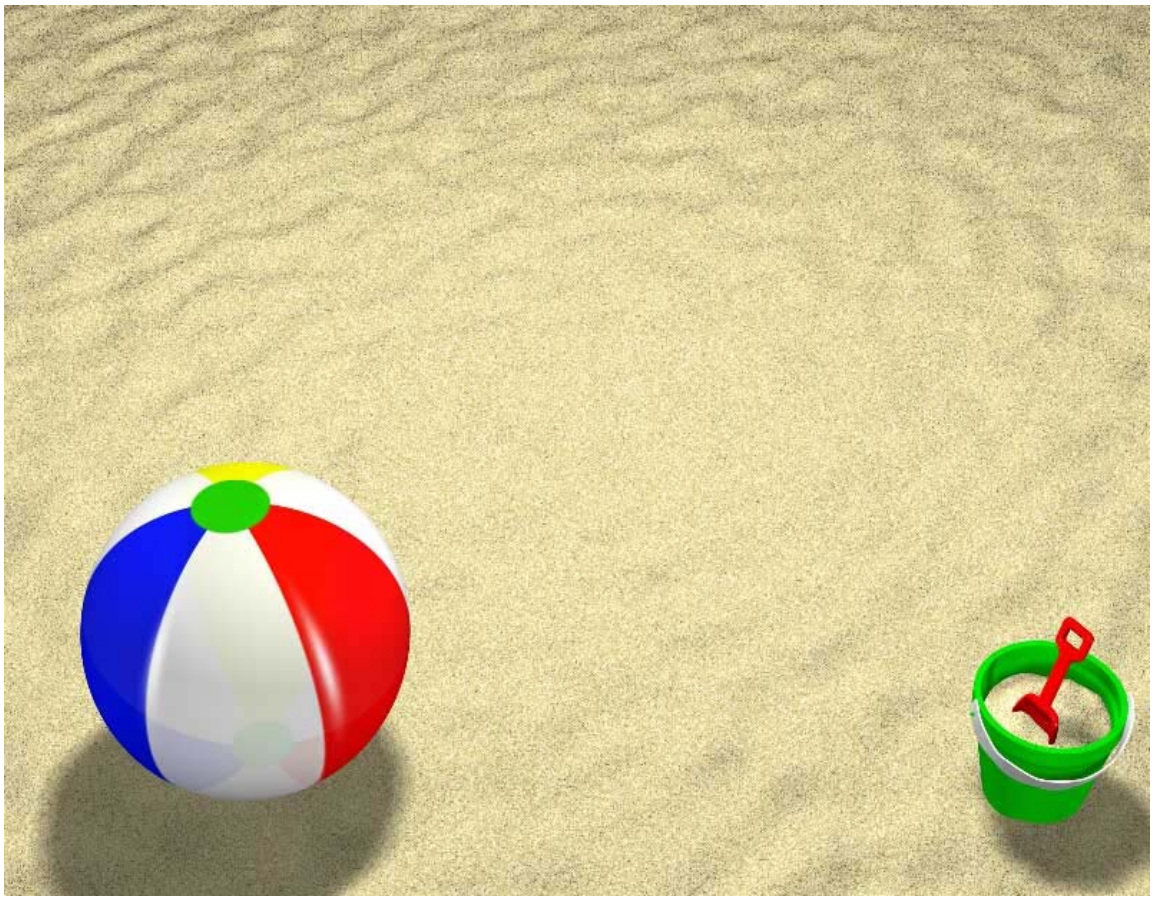
Circuit Sandbox

An open-source logic circuit simulator



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API Documentation

Package
gui

Contains the application's graphical user interface. The `gui`package is responsible for getting commands from the user and issuing them to the controller.

The main classes in the `gui`package are:
- `Gui`: The main `JFrame`class; communicates with the controller
- `Sandbox`: The `JComponent`that displays the model
- `Palette`: The `JTree`for selecting new components
- `Displayable`: The base class for all gui objects displayed in the `Sandbox`
- `ComponentImage`: The base class for gui logic components; correlates with `model.LogicComponent`

gui
Class And2Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.And2Image
```

public class **And2Image**
extends ComponentImage

`And2Image`extends the abstract class `ComponentImage`, and is the gui counterpart to And2Gate.

See Also:
And3Image, And4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`And2Image()` Constructs a new instance of `And2Image`, used by the toybox.
`public`	`And2Image(Gui gui,Point location)` Constructs a new instance of `And2Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

And2Image

`public` **`And2Image`**`()`

Constructs a new instance of `And2Image`, used by the toybox.

And2Image

`public` **`And2Image`**`(Gui gui,`
`Point location)`

Constructs a new instance of `And2Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

`public String` **`getTypeString`**`()`

toString

`public String` **`toString`**`()`

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"AND (2)"`

gui
Class And3Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.And3Image
```

public class **And3Image**
extends ComponentImage

`And3Image`extends the abstract class `ComponentImage`, and is the gui counterpart to And3Gate.

See Also:
And2Image, And4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`And3Image()` Constructs a new instance of `And3Image`, used by the toybox.
`public`	`And3Image(Gui gui,Point location)` Constructs a new instance of `And3Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

And3Image

`public` **`And3Image`**`()`

Constructs a new instance of `And3Image`, used by the toybox.

And3Image

`public` **`And3Image`**`(Gui gui,`
`Point location)`

Constructs a new instance of `And3Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

`public String` **`getTypeString`**`()`

toString

`public String` **`toString`**`()`

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"AND (3)"`

gui
Class And4Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.And4Image
```

public class **And4Image**
extends ComponentImage

`And4Image`extends the abstract class `ComponentImage`, and is the gui counterpart to And4Gate.

See Also:
And2Image, And3Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`And4Image()` Constructs a new instance of `And4Image`, used by the toybox.
`public`	`And4Image(Gui gui,Point location)` Constructs a new instance of `And4Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

And4Image

`public` **`And4Image`**`()`

Constructs a new instance of `And4Image`, used by the toybox.

And4Image

`public` **`And4Image`**`(Gui gui,`
`Point location)`

Constructs a new instance of `And4Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

`public String` **`getTypeString`**`()`

toString

`public String` **`toString`**`()`

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"AND (4)"`

gui
Class ButtonImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.ButtonImage
```

public class **ButtonImage**
extends ComponentImage

The gui part of a button.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`ButtonImage()` Creates a new instance of ButtonImage
`public`	`ButtonImage(Gui gui,Point location)` Constructs a new instance of `ButtonImage`with a given location in the sandbox.

Method Summary

byte	getState() Returns the state of the button image. 0- Off1- On
String	getTypeString() Returns a string that uniquely identifies each ButtonImageobject as a push button.
String	toString() Returns the plain english name of the button, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

ButtonImage

`public` **`ButtonImage`**`()`

Creates a new instance of ButtonImage

ButtonImage

`public` **`ButtonImage`**`(Gui gui,`
`Point location)`

Constructs a new instance of `ButtonImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getState

`public byte` **`getState`**`()`

Returns the state of the button image. `0`- Off`1`- On

Returns:

the button's state

getTypeString

`public String` **`getTypeString`**`()`

Returns a string that uniquely identifies each `ButtonImage`object as a push button.

Returns:

the identifying string

toString

`public String` **`toString`**`()`

Returns the plain english name of the button, for use in the toybox.

Returns:

the string `"Button"`

gui
Class ComponentDesignPane

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.ComponentDesignPane
```

public class **ComponentDesignPane**
extends JComponent

Displays the design of the new custom component as it is created in the `NewComponentDialog`.

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`ComponentDesignPane()` For compatibility with netbeans.
`public`	`ComponentDesignPane(HashSet inputs,HashSet outputs)` Constructs a new `ComponentDesignPane`object.

Method Summary

`Image`	`getImage()` Returns the image that represents the new component.
`ArrayList`	`getInputPins()` Returns an array of the custom component's input pins.
`ArrayList`	`getOutputPins()` Returns an array of the custom component's output pins.
`Rectangle`	`getPinBounds()` Returns the bounding box around the component image.
`void`	`paint(Graphics g)` Draws the component design pane.

void	`setImage(Image image)` Sets the image that will represent the new component.
void	`setMouseOverPin(PlaceholderPin pin)` Sets the pin the mouse is currently over so that the pin's identification information can be displayed.

Methods inherited from class `javax.swing.JComponent`

`addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI`

Methods inherited from class `java.awt.Container`

`add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree`

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

ComponentDesignPane

`public` **`ComponentDesignPane`**`()`

For compatibility with netbeans. Do not use this constructor.

ComponentDesignPane

```
public ComponentDesignPane(HashSet inputs,
                           HashSet outputs)
```

(continued from last page)

Constructs a new `ComponentDesignPane`object.

Parameters:

`inputs` - the set of inputs for the new component
`outputs` - the set of outputs for the new component

Methods

setImage

`public void` **`setImage`**`(Image image)`

Sets the image that will represent the new component. If `null`is passed, a default image will be generated.

Parameters:

`image` - the image

---

getImage

`public Image` **`getImage`**`()`

Returns the image that represents the new component.

Returns:

the new component's image (instances of Pin)

See Also:

`PlaceholderPin`

---

getInputPins

`public ArrayList` **`getInputPins`**`()`

Returns an array of the custom component's input pins.

Returns:

the array of input pins (instances of Pin)

See Also:

`PlaceholderPin`

---

getOutputPins

`public ArrayList` **`getOutputPins`**`()`

Returns an array of the custom component's output pins.

Returns:

the array of output pins

---

getPinBounds

`public Rectangle` **`getPinBounds`**`()`

Returns the bounding box around the component image. The pins must stay within this area.

Returns:

the rectangle around the component

(continued from last page)

setMouseOverPin

`public void setMouseOverPin(PlaceholderPin pin)`

Sets the pin the mouse is currently over so that the pin's identification information can be displayed.

Parameters:

`pin` - the pin, or `null`if mouse isnt over a pin

---

paint

`public void paint(Graphics g)`

Draws the component design pane.

Parameters:

`g` - the graphics to use

gui
Class ComponentImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
```

Direct Known Subclasses:
And2Image, And3Image, And4Image, ButtonImage, CustomImage, DFlipFlopImage, GroundImage, HexDigitImage, JKFlipFlopImage, LEDImage, Nand2Image, Nand3Image, Nand4Image, Nor2Image, Nor3Image, Nor4Image, NotImage, Or2Image, Or3Image, Or4Image, SwitchImage, VccImage, Xor2Image

---

public abstract class **ComponentImage**
extends Displayable

Extends `Displayable`to create an abstract super class for all component images. `ComponentImages` have two collections of `ComponentPin`objects which are drawn over their input and output locations. Adding a `ComponentImage`to the sandbox or removing it will add or remove its `ComponentPins`.

Each component image corresponds to 0 or 1 logic component in the model that simulates the actual function of the component represented. Component images are the visual manifestation of logic components.

Field Summary

int	`frame` the current image number to draw
static final String	`IMAGE_PATH` the relative path where all the component bitmaps are stored Value: **`images/components/`**
static HashMap	`inputPinLocations` the collection of visual locations for component input pins.
ComponentPin[]	`inputPins` the component's graphical wire attachment points (inputs)
LogicComponent	`logicComponent` the corresponding logic component in the model
static HashMap	`outputPinLocations` the collection of visual locations for component output pins.
ComponentPin[]	`outputPins` the component's graphical wire attachment points (outputs)

Fields inherited from class gui.Displayable
COMPONENT, COMPONENT_PIN, gui, ignoreLeftMouse, leftClickedX, leftClickedY, prevLocation, selected, WIRE, WIRE_NODE

Fields inherited from class javax.swing.JComponent
accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component
BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	ComponentImage() Creates new form ComponentImage Note: Do not use this constructor, its for NetBeans only.
public	ComponentImage(Gui gui,Point location) Constructs a new component image with a location in the sandbox.

Method Summary

void	addToSandbox(Sandbox sandbox) Adds the component to the sandbox.
void	bringToFront(Sandbox sandbox) Brings the component to the front of the Z-order in the sandbox.
void	centerAt(Point location) Centers the Displayableat the given location.
Cursor	getAddingCursor() Returns a 32x32 Cursorcontaining the component's first image frame with a small arrow.
int	getCustomComponentPin() Returns the pin number this component will be mapped to, should the model be saved as a custom component.
int	getDisplayableType() Identifies ComponentImageobjects as the COMPONENT type of Displayable.
Icon	getIcon() Returns a small 18x18 Iconof the component's first image frame.
ComponentPin	getInputPin(int pinNumber) Returns the gui pin object associated with the given input number.
Point	getInputPinLocation(int pinNumber) Returns the center point of the specified input pin.

LogicComponent	getLogicComponent() Returns the component images's corresponding LogicComponentthat is used in the model.
ComponentPin	getOutputPin(int pinNumber) Returns the gui pin object associated with the given output number.
Point	getOutputPinLocation(int pinNumber) Returns the center point of the specified output pin.
abstract String	getTypeString() Returns a string that uniquely identifies each type of ComponentImage.
void	loadImages(List imageList) Loads a list of image files representing the component.
static void	loadPinLocations() Loads the visual locations for all components' input and output pins from a text file.
void	paint(Graphics g) Draws the component.
void	removeFromSandbox(Sandbox sandbox) Removes the component from the sandbox.
void	resetState() Resets the frame back to 0 after exiting simulation mode.
void	setCustomComponentPin(int pinNumber) Sets the pin number this component will be mapped to, should the model be saved as a custom component.
void	setLogicComponent(LogicComponent logicComponent) Sets the image component's corresponding logical LogicComponentthat is used by the model.
void	setState(byte state) Sets the state of the component image.
void	shiftLocation(int xShift,int yShift) Moves the ComponentImageand its pins by a relative amount.

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

inputPins

protected gui.ComponentPin **inputPins**

the component's graphical wire attachment points (inputs)

outputPins

protected gui.ComponentPin **outputPins**

(continued from last page)

the component's graphical wire attachment points (outputs)

logicComponent

`protected model.LogicComponent` **`logicComponent`**

the corresponding logic component in the model

frame

`protected int` **`frame`**

the current image number to draw

IMAGE_PATH

`public static final java.lang.String` **`IMAGE_PATH`**

the relative path where all the component bitmaps are stored

inputPinLocations

`protected static java.util.HashMap` **`inputPinLocations`**

the collection of visual locations for component input pins. the key is the typeString of a component and the value is an array of Points.

outputPinLocations

`protected static java.util.HashMap` **`outputPinLocations`**

the collection of visual locations for component output pins. the key is the typeString of a component and the value is an array of Points.

Constructors

ComponentImage

`public` **`ComponentImage`**`()`

Creates new form ComponentImage Note: Do not use this constructor, its for NetBeans only.

ComponentImage

```
public ComponentImage(Gui gui,
                      Point location)
```

Constructs a new component image with a location in the sandbox. The location should be in standard coordinates.

Parameters:

`gui` - the gui
`location` - the location in the sandbox (may be `null`)

Methods

setLogicComponent

`public void` **`setLogicComponent`**`(LogicComponent logicComponent)`

Sets the image component's corresponding logical `LogicComponent`that is used by the model. This method should only be called by a logic component's `setCustomImage`method.

Parameters:

(continued from last page)

`logicComponent` - the logic component (not `null`)

getLogicComponent

`public LogicComponent getLogicComponent()`

Returns the component images's corresponding `LogicComponent`that is used in the model.

Returns:

the logic component object

setState

`public void setState(byte state)`

Sets the state of the component image. The state is used to choose the number of the frame that will be displayed when the component is painted. Each subclass that needs this method must implement it according to the states it has.

Parameters:

`state` - the state number

resetState

`public void resetState()`

Resets the frame back to 0 after exiting simulation mode. This method is called by the `resetState`method of the component image's corresponding logic component.

loadImages

`protected void loadImages(List imageList)`

Loads a list of image files representing the component. The first image will be used in editing mode. All images have the same dimensions.

Parameters:

`imageList` - the list of `String`image file paths

paint

`public void paint(Graphics g)`

Draws the component.

Parameters:

`g` - the graphics to draw with

bringToFront

`public void bringToFront(Sandbox sandbox)`

Brings the component to the front of the Z-order in the sandbox.

Parameters:

`sandbox` - the sandbox

centerAt

`public void centerAt(Point location)`

Centers the `Displayable`at the given location. The location must be in standard coordinates.

Parameters:

(continued from last page)

`location` - the location

shiftLocation

`public void` **`shiftLocation`**`(int xShift, int yShift)`

Moves the `ComponentImage`and its pins by a relative amount.

Parameters:

`xShift` - the horizontal distance in standard coordinates
`yShift` - the vertical distance in standard coordinates

addToSandbox

`public void` **`addToSandbox`**`(Sandbox sandbox)`

Adds the component to the sandbox.

Parameters:

`sandbox` - the sandbox

removeFromSandbox

`public void` **`removeFromSandbox`**`(Sandbox sandbox)`

Removes the component from the sandbox.

Parameters:

`sandbox` - the sandbox

getOutputPinLocation

`public Point` **`getOutputPinLocation`**`(int pinNumber)`

Returns the center point of the specified output pin.

Parameters:

`pinNumber` - the number of the pin whose center is to be returned

Returns:

the center coordinates of the pin

getOutputPin

`public ComponentPin` **`getOutputPin`**`(int pinNumber)`

Returns the gui pin object associated with the given output number.

Parameters:

`pinNumber` - the number of the output

Returns:

the component pin

getInputPinLocation

`public Point` **`getInputPinLocation`**`(int pinNumber)`

Returns the center point of the specified input pin.

Parameters:

(continued from last page)

`pinNumber` - the number of the pin whose center is to be returned

Returns:

the center coordinates of the pin

---

getInputPin

`public ComponentPin getInputPin(int pinNumber)`

Returns the gui pin object associated with the given input number.

Parameters:

`pinNumber` - the number of the input

Returns:

the component pin

---

setCustomComponentPin

`public void setCustomComponentPin(int pinNumber)`

Sets the pin number this component will be mapped to, should the model be saved as a custom component. This is only relevant for strictly input and output components.

Parameters:

`pinNumber` - the pin number

---

getCustomComponentPin

`public int getCustomComponentPin()`

Returns the pin number this component will be mapped to, should the model be saved as a custom component. This is only relevant for strictly input and output components.

Returns:

the pin number

---

getDisplayableType

`public int getDisplayableType()`

Identifies `ComponentImage`objects as the COMPONENT type of `Displayable`.

Returns:

`Displayable.COMPONENT`

---

getTypeString

`public abstract String getTypeString()`

Returns a string that uniquely identifies each type of `ComponentImage`. This method is analogous to `LogicComponent.getTypeString()`and when implemented will return this component image's `LogicComponent`'s type string.

Returns:

the identifying string

---

getIcon

`public Icon getIcon()`

Returns a small 18x18 `Icon`of the component's first image frame. The icon is used by the `Toybox`to display the components. The `Icon`object is created the first time this method is called, and cached for subsequent calls.

(continued from last page)

Returns:
the icon

getAddingCursor

`public Cursor getAddingCursor()`

Returns a 32x32 `Cursor`containing the component's first image frame with a small arrow.

Returns:
the cursor

loadPinLocations

`protected static void loadPinLocations()`

Loads the visual locations for all components' input and output pins from a text file. If there is an error reading the file, an error is sent to the console. The application must terminate.

gui
Class ComponentPin

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentPin
```

public class **ComponentPin**
extends Displayable

`ComponentPin`extends `Displayable`and is the gui representation of an input/output pin.

Field Summary

static final int	`ALL_PINS` the pin type for both pin types Value: **3**
static final int	`INPUT_PIN` the pin type for an input pin Value: **1**
static final int	`NO_PINS` the pin type for neither pin type Value: **0**
static final int	`OUTPUT_PIN` the pin type for an output pin Value: **2**
static final int	`RADIUS` the radius of circle representing the component pin Value: **5**

Fields inherited from class `gui.Displayable`

`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`

`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	ComponentPin(Gui gui,Point location,ComponentImage owner,int pinType,int pinNumber) Constructs a new ComponentPinobject, given a component image that owns it, a pin type, pin number and location in the sandbox.

Method Summary

void	addToSandbox(Sandbox sandbox) Adds the pin to the sandbox.
int	getDisplayableType() Identifies ComponentPinobjects as the COMPONENT_PINtype of Displayable.
ComponentImage	getOwner() Returns the ComponentImageobject that owns this pin.
void	paint(Graphics g) Paints the component pin.
void	removeFromSandbox(Sandbox sandbox) Removes the pin from the sandbox.

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

NO_PINS

public static final int **NO_PINS**

the pin type for neither pin type

INPUT_PIN

public static final int **INPUT_PIN**

(continued from last page)

the pin type for an input pin

OUTPUT_PIN

```
public static final int OUTPUT_PIN
```

the pin type for an output pin

ALL_PINS

```
public static final int ALL_PINS
```

the pin type for both pin types

RADIUS

```
public static final int RADIUS
```

the radius of circle representing the component pin

Constructors

ComponentPin

```
public ComponentPin(Gui gui,
                    Point location,
                    ComponentImage owner,
                    int pinType,
                    int pinNumber)
```

Constructs a new `ComponentPin`object, given a component image that owns it, a pin type, pin number and location in the sandbox. The pin type must be either `INPUT_PIN`or `OUTPUT_PIN`. The location must be in standard coordinates.

Parameters:

`gui` - the gui
`location` - the center of the pin, relative to the owner
`owner` - the component image to which this pin belongs
`pinType` - the type of pin (an input or an output)
`pinNumber` - the pin number on the owner component

Methods

getDisplayableType

```
public int getDisplayableType()
```

Identifies `ComponentPin`objects as the `COMPONENT_PIN`type of `Displayable`.

Returns:

`Displayable.COMPONENT_PIN`

getOwner

```
public ComponentImage getOwner()
```

Returns the `ComponentImage`object that owns this pin.

Returns:

the pin's owner

(continued from last page)

addToSandbox

`public void` **`addToSandbox`**`(Sandbox sandbox)`

Adds the pin to the sandbox.

Parameters:

`sandbox` - the sandbox

removeFromSandbox

`public void` **`removeFromSandbox`**`(Sandbox sandbox)`

Removes the pin from the sandbox.

Parameters:

`sandbox` - the sandbox

paint

`public void` **`paint`**`(Graphics g)`

Paints the component pin.

Parameters:

`g` - the `Graphics`to be used

gui
Class CustomImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.CustomImage
```

public class **CustomImage**
extends ComponentImage

The gui part of a `ComponentImage`.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`CustomImage(String filePath)` Creates a new instance of CustomImage
`public`	`CustomImage(Gui gui,Point location,String filePath)`

Method Summary

`String`	`getTypeString()`

String	toString()

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

CustomImage

```
public CustomImage(String filePath)
```

Creates a new instance of CustomImage

CustomImage

```
public CustomImage(Gui gui,
                   Point location,
                   String filePath)
```

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

gui
Class DFlipFlopImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.DFlipFlopImage
```

public class **DFlipFlopImage**
extends ComponentImage

`DFlipFlopImage`extends the abstract class `ComponentImage`, and is the gui counterpart to DFlipFlop.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`DFlipFlopImage()` Constructs a new instance of `DFlipFlopImage`, used by the toybox.
`public`	`DFlipFlopImage(Gui gui,Point location)` Constructs a new instance of `DFlipFlopImage`with a given location in the sandbox.

Method Summary

`String`	`getTypeString()`

String	toString() Returns the plain english name of the component, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

DFlipFlopImage

`public DFlipFlopImage()`

Constructs a new instance of `DFlipFlopImage`, used by the toybox.

DFlipFlopImage

```
public DFlipFlopImage(Gui gui,
                      Point location)
```

Constructs a new instance of `DFlipFlopImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

`public String getTypeString()`

toString

`public String toString()`

Returns the plain english name of the component, for use in the toybox.

Returns:

the string `"D FLIP-FLOP"`

gui
Class Displayable

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
```

Direct Known Subclasses:
ComponentImage, ComponentPin, WireImage, WireNode

---

public abstract class **Displayable**
extends JComponent

`Displayable`is the superclass of all logic components, input/ output pins, wires, and wire nodes.

Field Summary

`static final int`	`COMPONENT` Value: **`0`**
`static final int`	`COMPONENT_PIN` Value: **`1`**
`Gui`	`gui` the gui
`boolean`	`ignoreLeftMouse` flag indicating left mouse drag events should be ignored until mouse button release
`int`	`leftClickedX` the x coordinate of the mouse when the left button was pressed (in screen units)
`int`	`leftClickedY` the y coordinate of the mouse when the left button was pressed (in screen units)
`Point`	`prevLocation` the location of the Displayable before it was dragged (in screen coordinates
`boolean`	`selected` flag indicating this Displayable is currently selected
`static final int`	`WIRE` Value: **`2`**
`static final int`	`WIRE_NODE` Value: **`3`**

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Displayable(Gui gui,Point location)` Constructs a new `Displayable`object.

Method Summary

`abstract void`	`addToSandbox(Sandbox sandbox)` Extend this method to add the displayable to the given sandbox.
`void`	`bringToFront(Sandbox sandbox)` Brings the `Displayable`to the front of the Z-order in the sandbox.
`void`	`centerAt(Point location)` Centers the `Displayable`at the given location.
`void`	`displayableMouseDragged(MouseEvent event)` Handles mouseDragged events for the `Displayable`.
`void`	`displayableMousePressed(MouseEvent event)` Handles mousePressed events for the `Displayable`.
`void`	`displayableMouseReleased(MouseEvent event)` Handles mouseReleased events for the `Displayable`.
`abstract int`	`getDisplayableType()` Extend this method to return a value identifying the type of displayable that the subclass is.
`Point`	`getStdCenter()` Returns the center point of the `displayable`in standard coordinates.
`int`	`getStdHeight()` Returns the height in standard units.
`Point`	`getStdLocation()` Returns the location in standard coordinates.
`int`	`getStdWidth()` Returns the width in standard units.

int	`getStdX()` Returns the x coordinate of the location in standard coordinates.
int	`getStdY()` Returns the y coordinate of the location in standard coordinates.
boolean	`isSelected()` Returns `true`if the `Displayable`is currently selected.
abstract void	`removeFromSandbox(Sandbox sandbox)` Extend this method to remove the displayable from the given sandbox.
void	`setSelected(boolean selected)` Selects or unselects the `Displayable`.
void	`setStdLocation(int x,int y)` Sets the location, using standard coordinates.
void	`setStdLocation(Point location)` Sets the location, using standard coordinates.
Dimension	`setStdSize()` Returns the size in standard units.
void	`setStdSize(Dimension size)` Sets the size in standard units.
void	`setStdSize(int width,int height)` Sets the size in standard units.
void	`shiftLocation(int xShift,int yShift)` Moves the `Displayable`in its parent container by a relative amount.
void	`zoom()` Updates the magnification level of the component to the gui's current magnification level.

Methods inherited from class `javax.swing.JComponent`

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

gui

`protected gui.Gui` **`gui`**

the gui

leftClickedX

`protected int` **`leftClickedX`**

the x coordinate of the mouse when the left button was pressed (in screen units)

leftClickedY

`protected int` **`leftClickedY`**

the y coordinate of the mouse when the left button was pressed (in screen units)

selected

`protected boolean` **`selected`**

flag indicating this Displayable is currently selected

ignoreLeftMouse

`protected boolean` **`ignoreLeftMouse`**

flag indicating left mouse drag events should be ignored until mouse button release

prevLocation

`protected java.awt.Point` **`prevLocation`**

the location of the Displayable before it was dragged (in screen coordinates

COMPONENT

`public static final int` **`COMPONENT`**

COMPONENT_PIN

`public static final int` **`COMPONENT_PIN`**

WIRE

`public static final int` **`WIRE`**

WIRE_NODE

`public static final int` **`WIRE_NODE`**

Constructors

Displayable

```
public Displayable(Gui gui,
                   Point location)
```

Constructs a new `Displayable`object.

Parameters:

`gui` - the gui

`location` - the location of the `Displayable`in standard coordinates

(continued from last page)

Methods

isSelected

`public boolean isSelected()`

Returns `true` if the `Displayable` is currently selected.

Returns:

`true` if the object is selected, otherwise `false`

---

setSelected

`public void setSelected(boolean selected)`

Selects or unselects the `Displayable`.

Parameters:

`selected` - the selection state

---

zoom

`public void zoom()`

Updates the magnification level of the component to the gui's current magnification level. This involves changing the location of the component in screen coordinates, as well as resizing the component in screen coordinates.

---

bringToFront

`public void bringToFront(Sandbox sandbox)`

Brings the `Displayable` to the front of the Z-order in the sandbox.

Parameters:

`sandbox` - the sandbox

---

centerAt

`public void centerAt(Point location)`

Centers the `Displayable` at the given location. The location must be in standard coordinates.

Parameters:

`location` - the location

---

getStdCenter

`public Point getStdCenter()`

Returns the center point of the `displayable` in standard coordinates.

Returns:

the center point

---

shiftLocation

`public void shiftLocation(int xShift, int yShift)`

Moves the `Displayable` in its parent container by a relative amount. The distances should be in standard coordinates

Parameters:

(continued from last page)

`xShift` - the horizontal distance
`yShift` - the vertical distance

setStdLocation

`public void setStdLocation(Point location)`

Sets the location, using standard coordinates.

Parameters:

`location` - the new location

setStdLocation

`public void setStdLocation(int x, int y)`

Sets the location, using standard coordinates.

Parameters:

`x` - the x coordinate
`y` - the y coordinate

getStdLocation

`public Point getStdLocation()`

Returns the location in standard coordinates.

Returns:

the location

getStdX

`public int getStdX()`

Returns the x coordinate of the location in standard coordinates.

Returns:

the x coordinate

getStdY

`public int getStdY()`

Returns the y coordinate of the location in standard coordinates.

Returns:

the y coordinate

setStdSize

`public void setStdSize(Dimension size)`

Sets the size in standard units.

Parameters:

`size` - the new dimensions

(continued from last page)

setStdSize

```
public void setStdSize(int width,
                       int height)
```

Sets the size in standard units.

Parameters:

`width` - the new width
`height` - the new height

---

setStdSize

```
public Dimension setStdSize()
```

Returns the size in standard units.

Returns:

the size

---

getStdWidth

```
public int getStdWidth()
```

Returns the width in standard units.

Returns:

the width

---

getStdHeight

```
public int getStdHeight()
```

Returns the height in standard units.

Returns:

the height

---

displayableMousePressed

```
protected void displayableMousePressed(MouseEvent event)
```

Handles mousePressed events for the `Displayable`. This method takes care of selecting/unselecting the object. It is called by event handling methods of classes that extend `Displayable`.

Parameters:

`event` - the mouse event

---

displayableMouseDragged

```
protected void displayableMouseDragged(MouseEvent event)
```

Handles mouseDragged events for the `Displayable`. This method takes care of moving the object. It is called by event handling methods of classes that extend `Displayable`.

Parameters:

`event` - the mouse event

---

displayableMouseReleased

```
protected void displayableMouseReleased(MouseEvent event)
```

(continued from last page)

Handles mouseReleased events for the `Displayable`. This method takes care of moving the object. It is called by event handling methods of classes that extend `Displayable`.

Parameters:

`event` - the mouse event

addToSandbox

`public abstract void` **`addToSandbox`**`(Sandbox sandbox)`

Extend this method to add the displayable to the given sandbox.

Parameters:

`sandbox` - the sandbox

removeFromSandbox

`public abstract void` **`removeFromSandbox`**`(Sandbox sandbox)`

Extend this method to remove the displayable from the given sandbox.

Parameters:

`sandbox` - the sandbox

getDisplayableType

`public abstract int` **`getDisplayableType`**`()`

Extend this method to return a value identifying the type of displayable that the subclass is. Possible values to return are `COMPONENT`for a component image, `COMPONENT_PIN`for a component pin, `WIRE`for a wire, and `WIRE_NODE`for a wire path node.

Returns:

the type of `Displayable`

gui
Class GroundImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.GroundImage
```

public class **GroundImage**
extends ComponentImage

The gui part of a grounded terminal.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`GroundImage()` Creates a new instance of GroundImage
`public`	`GroundImage(Gui gui,Point location)` Constructs a new instance of `GroundImage`with a given location in the sandbox.

Method Summary

String	getTypeString() Returns a string that uniquely identifies each GroundImageobject as a grounded terminal.
String	toString() Returns the plain english name of the switch, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

GroundImage

```
public GroundImage()
```

Creates a new instance of GroundImage

GroundImage

```
public GroundImage(Gui gui,
                   Point location)
```

Constructs a new instance of `GroundImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

Returns a string that uniquely identifies each `GroundImage`object as a grounded terminal.

Returns:

the identifying string

toString

```
public String toString()
```

Returns the plain english name of the switch, for use in the toybox.

Returns:

the string `"Button"`

gui
Class Gui

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-java.awt.Window
            ┗-java.awt.Frame
               ┗-javax.swing.JFrame
                  ┗-gui.Gui
```

public class **Gui**
extends JFrame

Contains the application's main window. The `Gui`class is responsible for responding to the user and interacting with the controller to perform commands.

The basic layout of the frame is simple. A `JToolbar`stretches left to right at the top of the frame. The rest is filled with a `JSplitFrame`, with the `toybox`on the left and the `sandbox`on the right.

Fields inherited from class `javax.swing.JFrame`
`accessibleContext`, `EXIT_ON_CLOSE`, `rootPane`, `rootPaneCheckingEnabled`

Fields inherited from class `java.awt.Frame`
`CROSSHAIR_CURSOR`, `DEFAULT_CURSOR`, `E_RESIZE_CURSOR`, `HAND_CURSOR`, `ICONIFIED`, `MAXIMIZED_BOTH`, `MAXIMIZED_HORIZ`, `MAXIMIZED_VERT`, `MOVE_CURSOR`, `N_RESIZE_CURSOR`, `NE_RESIZE_CURSOR`, `NORMAL`, `NW_RESIZE_CURSOR`, `S_RESIZE_CURSOR`, `SE_RESIZE_CURSOR`, `SW_RESIZE_CURSOR`, `TEXT_CURSOR`, `W_RESIZE_CURSOR`, `WAIT_CURSOR`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Gui()` Do not use, for NetBeans compatibility only.
`public`	`Gui(Controller controller)` Constructs a new `Gui`frame.

Method Summary

void	`addComponent(Point location)` Add the component to the sandbox.
void	`addToSandbox(Displayable displayable)` Adds a `Displayable`object to the sandbox and redraws it.
void	`addToSelection(ArrayList list)` Adds the list of `Displayable`objects to the current selection.
void	`addToSelection(Displayable displayable)` Adds the `Displayable`object to the current selection.
void	`bringToFront(Displayable displayable)` Move the `Displayable`object to the top in the sandbox.
void	`cancelWire()` Exits the Add Wire mode.
void	`clearSelection()` Clears the current selection.
WireImage	`getNewWire()` Returns the wire currently being created.
Sandbox	`getSandbox()` Returns the sandbox.
long	`getSimDelay()` Returns the simulation delay from the controller.
float	`getZoomFactor()` Returns the zoom factor for viewing the sandbox.
void	`insertWireNode(WireImage wireImage,int segment,int x,int y)` Inserts a wire node into a segment of an existing wire's path.
boolean	`isAddingComponent()` Returns `true`if the gui is currently in the adding a new component from the toybox state.
boolean	`isCreatingWire()` Returns `true`if the gui is currently in the creating a new wire state.
boolean	`isNodeClickable()` Returns `true`if the node can be highlighted and clicked on.
boolean	`isPinClickable(int pinType)` Returns `true`if the pin can be highlighted and clicked on.
boolean	`isSelectionEmpty()` Returns `true`nothing is selected in the sandbox.
boolean	`isSimulating()` Returns `true`if the gui is currently in simulation mode.

void	`loadToToybox(String type)` Instructs the toybox to load the specified component into its custom components category.
void	`moveSelection(int xShift,int yShift)` Moves all the selected objects by a given distance.
void	`placeNewWireNode(int x,int y)` Places a new node along the path of the wire currently being created.
void	`placeWireLead(ComponentImage component,int pinType,int pinNumber)` Begins creating a wire from the specified pin of a component.
void	`placeWireTail(ComponentImage component,int pinType,int pinNumber)` Finishes creating a wire with the specified pin of a component.
void	`removeFromSandbox(Displayable displayable)` Removes a `Displayable`object from the sandbox and redraws it.
void	`removeFromSelection(Collection group)` Removes a group of `Displayable`objects from the current selection.
void	`removeFromSelection(Displayable displayable)` Removes the `Displayable`object from the current selection.
void	`repaintSandbox()` Passes the `repaint`command to the sandbox.
void	`resizeSandbox()` Passes the `resize`command to the sandbox.
void	`select(Displayable d)` Sets the current selection to the given displayable object.
void	`selectionMoved(int xShift,int yShift)` Notifies the `controller`that the selection has been moved.
void	`setComponentToAdd(ComponentImage component)` Sets the component currently being added to the sandbox.
void	`setZoomFactor(float zoom)` Sets the zoom factor of the sandbox.
void	`showError(String message)` Displays a pop-up box with an error message.
void	`stopSimulation()` Stops executing the simulation.

Methods inherited from class `javax.swing.JFrame`

addImpl, createRootPane, frameInit, getAccessibleContext, getContentPane, getDefaultCloseOperation, getGlassPane, getJMenuBar, getLayeredPane, getRootPane, isDefaultLookAndFeelDecorated, isRootPaneCheckingEnabled, paramString, processWindowEvent, remove, setContentPane, setDefaultCloseOperation, setDefaultLookAndFeelDecorated, setGlassPane, setIconImage, setJMenuBar, setLayeredPane, setLayout, setRootPane, setRootPaneCheckingEnabled, update

Methods inherited from class `java.awt.Frame`

addNotify, finalize, getAccessibleContext, getCursorType, getExtendedState, getFrames, getIconImage, getMaximizedBounds, getMenuBar, getState, getTitle, isResizable, isUndecorated, paramString, remove, removeNotify, setCursor, setExtendedState, setIconImage, setMaximizedBounds, setMenuBar, setResizable, setState, setTitle, setUndecorated

Methods inherited from class `java.awt.Window`

addNotify, addPropertyChangeListener, addPropertyChangeListener, addWindowFocusListener, addWindowListener, addWindowStateListener, applyResourceBundle, applyResourceBundle, createBufferStrategy, createBufferStrategy, dispose, finalize, getAccessibleContext, getBufferStrategy, getFocusableWindowState, getFocusCycleRootAncestor, getFocusOwner, getFocusTraversalKeys, getGraphicsConfiguration, getInputContext, getListeners, getLocale, getMostRecentFocusOwner, getOwnedWindows, getOwner, getToolkit, getWarningString, getWindowFocusListeners, getWindowListeners, getWindowStateListeners, hide, isActive, isAlwaysOnTop, isFocusableWindow, isFocusCycleRoot, isFocused, isLocationByPlatform, isShowing, pack, postEvent, processEvent, processWindowEvent, processWindowFocusEvent, processWindowStateEvent, removeWindowFocusListener, removeWindowListener, removeWindowStateListener, setAlwaysOnTop, setBounds, setCursor, setFocusableWindowState, setFocusCycleRoot, setLocationByPlatform, setLocationRelativeTo, show, toBack, toFront

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Gui

```
public Gui()
```

Do not use, for NetBeans compatibility only.

Gui

```
public Gui(Controller controller)
```

(continued from last page)

Constructs a new `Guiframe`.

Parameters:

`controller` - the gui's controller

Methods

cancelWire

`public void cancelWire()`

Exits the Add Wire mode. `wireBeingCreated`will be cleared.

---

isCreatingWire

`public boolean isCreatingWire()`

Returns `true`if the gui is currently in the creating a new wire state.

Returns:

`true`if the user is creating a wire, otherwise `false`

---

placeWireLead

```
public void placeWireLead(ComponentImage component,
          int pinType,
          int pinNumber)
```

Begins creating a wire from the specified pin of a component.

Parameters:

`component` - the `ComponentImage`the wire is being attached to
`pinType` - the pin type (input or output)
`pinNumber` - the number of the pin on the component

---

placeWireTail

```
public void placeWireTail(ComponentImage component,
          int pinType,
          int pinNumber)
```

Finishes creating a wire with the specified pin of a component.

Parameters:

`component` - the `ComponentImage`the wire is being attached to
`pinType` - the pin type (input or output)
`pinNumber` - the number of the pin on the component

---

placeNewWireNode

```
public void placeNewWireNode(int x,
          int y)
```

Places a new node along the path of the wire currently being created.

Parameters:

`x` - the x coordinate
`y` - the y coordinate

(continued from last page)

getNewWire

`public WireImage getNewWire()`

Returns the wire currently being created. If a wire is not being created at this time, `null` is returned.

Returns:

the wire image being created

---

insertWireNode

```
public void insertWireNode(WireImage wireImage,
                           int segment,
                           int x,
                           int y)
```

Inserts a wire node into a segment of an existing wire's path. The location must be in standard coordinates.

Parameters:

`wireImage` - the wire image receiving the new node
`segment` - the segment to split, base 0 starting from the source
`x` - the x coordinate
`y` - the y coordinate

---

isPinClickable

`public boolean isPinClickable(int pinType)`

Returns `true` if the pin can be highlighted and clicked on.

Parameters:

`pinType` - the code for the pinType

Returns:

`true` if the pin can be used

See Also:

`ComponentPin`

---

isNodeClickable

`public boolean isNodeClickable()`

Returns `true` if the node can be highlighted and clicked on.

Returns:

`true` if the node can be clicked on

---

isAddingComponent

`public boolean isAddingComponent()`

Returns `true` if the gui is currently in the adding a new component from the toybox state.

Returns:

`true` if the user is adding a component, otherwise `false`

---

isSimulating

`public boolean isSimulating()`

Returns `true` if the gui is currently in simulation mode.

(continued from last page)

Returns:
`true`if the simulation is running

stopSimulation

`public void` **`stopSimulation`**`()`

Stops executing the simulation. If this is called and the simulation is running, it will have no side effects.

bringToFront

`public void` **`bringToFront`**`(Displayable displayable)`

Move the `Displayable`object to the top in the sandbox.

Parameters:
`displayable` - the obect to bring to the top

isSelectionEmpty

`public boolean` **`isSelectionEmpty`**`()`

Returns `true`nothing is selected in the sandbox.

Returns:
`true`if the selection is empty

select

`public void` **`select`**`(Displayable d)`

Sets the current selection to the given displayable object.

Parameters:
`d` - the displayable object to select

addToSelection

`public void` **`addToSelection`**`(Displayable displayable)`

Adds the `Displayable`object to the current selection.

Parameters:
`displayable` - the displayable object

addToSelection

`public void` **`addToSelection`**`(ArrayList list)`

Adds the list of `Displayable`objects to the current selection.

Parameters:
`list` - the list of `Displayables`

removeFromSelection

`public void` **`removeFromSelection`**`(Collection group)`

Removes a group of `Displayable`objects from the current selection.

Parameters:
`group` - the `Displayables`

removeFromSelection

`public void removeFromSelection(Displayable displayable)`

Removes the `Displayable`object from the current selection.

Parameters:

`displayable` - the `Displayable`

clearSelection

`public void clearSelection()`

Clears the current selection.

moveSelection

`public void moveSelection(int xShift, int yShift)`

Moves all the selected objects by a given distance. The distances are in standard units.

Parameters:

`xShift` - the horizontal distance
`yShift` - the vertical distance

addComponent

`public void addComponent(Point location)`

Add the component to the sandbox. The location should be in standard coordinates.

Parameters:

`location` - the location for the center of the component

selectionMoved

`public void selectionMoved(int xShift, int yShift)`

Notifies the `controller`that the selection has been moved. The distances are in standard units.

Parameters:

`xShift` - the horizontal distance
`yShift` - the vertical distance

setComponentToAdd

`public void setComponentToAdd(ComponentImage component)`

Sets the component currently being added to the sandbox. If the component is `null`, the gui will leave the adding component state.

Parameters:

`component` - the component image to be adding

loadToToybox

`public void loadToToybox(String type)`

Instructs the toybox to load the specified component into its custom components category.

(continued from last page)

Parameters:

`type` - the `typeString`of the component to load

repaintSandbox

`public void` **`repaintSandbox`**`()`

Passes the `repaint`command to the sandbox.

resizeSandbox

`public void` **`resizeSandbox`**`()`

Passes the `resize`command to the sandbox.

addToSandbox

`public void` **`addToSandbox`**`(Displayable displayable)`

Adds a `Displayable`object to the sandbox and redraws it. If the sandbox already contains the object, it will still be added again.

Parameters:

`displayable` - the `Displayable`to add

removeFromSandbox

`public void` **`removeFromSandbox`**`(Displayable displayable)`

Removes a `Displayable`object from the sandbox and redraws it. If the sandbox does not contain the object, nothing is done.

Parameters:

`displayable` - the `Displayable`to remove

showError

`public void` **`showError`**`(String message)`

Displays a pop-up box with an error message.

Parameters:

`message` - the message to display

getZoomFactor

`public float` **`getZoomFactor`**`()`

Returns the zoom factor for viewing the sandbox. 1.0 is no magnification, 2.0 is 200% magnification, etc.

Returns:

the zoom factor

setZoomFactor

`public void` **`setZoomFactor`**`(float zoom)`

Sets the zoom factor of the sandbox. 1.0 is no magnification, 2.0 is 200% magnification, etc.

Parameters:

`zoom` - the zoom factor

(continued from last page)

getSandbox

`public Sandbox getSandbox()`

Returns the sandbox. This is for debugging purposes only. // Remove this debugging method

Returns:

the sandbox

---

getSimDelay

`public long getSimDelay()`

Returns the simulation delay from the controller.

Returns:

the simulation delay

gui
Class HexDigitImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.HexDigitImage
```

public class **HexDigitImage**
extends ComponentImage

The gui part of a HexDigit.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`HexDigitImage()` Creates a new instance of HexDigitImage
`public`	`HexDigitImage(Gui gui,Point location)` Constructs a new instance of `HexDigitImage`with a given location in the sandbox.

Method Summary

String	getTypeString() Returns a string that uniquely identifies each HexDigitImageobject as a push button.
void	setState(byte s) Sets the state of the HexDigit image, called by the computemethod of HexDigit. 0-Off/Undefined>0 - Digit to display plus 1 (ex: 11 -> A)
String	toString() Returns the plain english name of the HexDigit, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

HexDigitImage

`public HexDigitImage()`

Creates a new instance of HexDigitImage

HexDigitImage

`public HexDigitImage(Gui gui, Point location)`

Constructs a new instance of `HexDigitImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

setState

`public void setState(byte s)`

Sets the state of the HexDigit image, called by the `compute`method of `HexDigit`. `0`- Off/Undefined>`0 - Digit to display plus 1 (ex: 11 -> A)`

Parameters:

`s` - the state

See Also:

`model.HexDigit`

getTypeString

`public String getTypeString()`

Returns a string that uniquely identifies each `HexDigitImage`object as a push button.

Returns:

the identifying string

toString

`public String toString()`

Returns the plain english name of the HexDigit, for use in the toybox.

Returns:

the string `"Hex Digit"`

gui
Class JKFlipFlopImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.JKFlipFlopImage
```

public class **JKFlipFlopImage**
extends ComponentImage

`JKFlipFlopImage`extends the abstract class `ComponentImage`, and is the gui counterpart to JKFlipFlop.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`JKFlipFlopImage()` Constructs a new instance of `JKFlipFlopImage`, used by the toybox.
`public`	`JKFlipFlopImage(Gui gui,Point location)` Constructs a new instance of `JKFlipFlopImage`with a given location in the sandbox.

Method Summary

`String`	`getTypeString()`

String	toString() Returns the plain english name of the component, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

JKFlipFlopImage

```
public JKFlipFlopImage()
```

Constructs a new instance of `JKFlipFlopImage`, used by the toybox.

JKFlipFlopImage

```
public JKFlipFlopImage(Gui gui,
                       Point location)
```

Constructs a new instance of `JKFlipFlopImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the component, for use in the toybox.

Returns:

the string `"JK FLIP-FLOP"`

gui
Class LEDImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.LEDImage
```

public class **LEDImage**
extends ComponentImage

The gui part of an LED.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`LEDImage()` Creates a new instance of LEDImage
`public`	`LEDImage(Gui gui,Point location)` Constructs a new instance of `LEDImage`with a given location in the sandbox.

Method Summary

String	getTypeString() Returns a string that uniquely identifies each LEDImageobject as a push button.
void	setState(byte s) Sets the state of the LED image, called by the computemethod of LED. LogicComponent.TRUE- OnLogicComponent.FALSE- OffLogicComponent.UNDEFINED- Off
String	toString() Returns the plain english name of the LED, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

LEDImage

```
public LEDImage()
```

Creates a new instance of LEDImage

LEDImage

```
public LEDImage(Gui gui,
                Point location)
```

Constructs a new instance of `LEDImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

setState

```
public void setState(byte s)
```

Sets the state of the LED image, called by the `compute`method of `LED`. `LogicComponent.TRUE`- On`LogicComponent.FALSE`- Off`LogicComponent.UNDEFINED`- Off

Parameters:

`s` - the state

See Also:

`model.LED`

getTypeString

```
public String getTypeString()
```

Returns a string that uniquely identifies each `LEDImage`object as a push button.

Returns:

the identifying string

toString

```
public String toString()
```

Returns the plain english name of the LED, for use in the toybox.

Returns:

the string `"LED"`

gui
Class Nand2Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nand2Image
```

public class **Nand2Image**
extends ComponentImage

`Nand2Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nand2Gate.

See Also:
Nand3Image, Nand4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nand2Image()` Creates a new instance of Nand2Image, used by Toybox
`public`	`Nand2Image(Gui gui,Point location)` Constructs a new instance of `Nand2Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the or gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nand2Image

```
public Nand2Image()
```

Creates a new instance of Nand2Image, used by Toybox

Nand2Image

```
public Nand2Image(Gui gui,
                  Point location)
```

Constructs a new instance of `Nand2Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the or gate, for use in the toybox.

Returns:

the string `"NAND (2)"`

gui
Class Nand3Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nand3Image
```

public class **Nand3Image**
extends ComponentImage

`Nand3Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nand3Gate.

See Also:
Nand2Image, Nand4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nand3Image()` Constructs a new instance of `Nand3Image`, used by the toybox.
`public`	`Nand3Image(Gui gui,Point location)` Constructs a new instance of `Nand3Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nand3Image

```
public Nand3Image()
```

Constructs a new instance of `Nand3Image`, used by the toybox.

Nand3Image

```
public Nand3Image(Gui gui,
                  Point location)
```

Constructs a new instance of `Nand3Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"NAND (3)"`

gui
Class Nand4Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nand4Image
```

public class **Nand4Image**
extends ComponentImage

`Nand4Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nand4Gate.

See Also:
Nand2Image, Nand3Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nand4Image()` Constructs a new instance of `Nand4Image`, used by the toybox.
`public`	`Nand4Image(Gui gui,Point location)` Constructs a new instance of `Nand4Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nand4Image

```
public Nand4Image()
```

Constructs a new instance of `Nand4Image`, used by the toybox.

Nand4Image

```
public Nand4Image(Gui gui,
                  Point location)
```

Constructs a new instance of `Nand4Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"NAND (4)"`

gui
Class NewComponentDialog

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-java.awt.Window
            ┗-java.awt.Dialog
               ┗-javax.swing.JDialog
                  ┗-gui.NewComponentDialog
```

public class **NewComponentDialog**
extends JDialog

A dialog box for saving a custom component.

Field Summary

static final int	OPTION_ACCEPT the accept option for this dialog, save the component Value: **1**
static final int	OPTION_CANCEL the cancel option for this dialog, dont save the component Value: **0**

Fields inherited from class javax.swing.JDialog
accessibleContext, rootPane, rootPaneCheckingEnabled

Fields inherited from class java.awt.Component
BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	NewComponentDialog(Gui gui,HashSet inputs,HashSet outputs) Creates new form NewComponentDialog

Method Summary

String	getComponentName() Returns the plain english name the user entered for the component.

Image	getImage() Returns the image the user selected to represent the component
ArrayList	getInputPins() Returns an array of the custom component's input pins.
ArrayList	getOutputPins() Returns an array of the custom component's output pins.
int	showDialog() Displays the dialog for the user.

Methods inherited from class javax.swing.JDialog

addImpl, createRootPane, dialogInit, getAccessibleContext, getContentPane, getDefaultCloseOperation, getGlassPane, getJMenuBar, getLayeredPane, getRootPane, isDefaultLookAndFeelDecorated, isRootPaneCheckingEnabled, paramString, processWindowEvent, remove, setContentPane, setDefaultCloseOperation, setDefaultLookAndFeelDecorated, setGlassPane, setJMenuBar, setLayeredPane, setLayout, setRootPane, setRootPaneCheckingEnabled, update

Methods inherited from class java.awt.Dialog

addNotify, getAccessibleContext, getTitle, hide, isModal, isResizable, isUndecorated, paramString, setModal, setResizable, setTitle, setUndecorated, show

Methods inherited from class java.awt.Window

addNotify, addPropertyChangeListener, addPropertyChangeListener, addWindowFocusListener, addWindowListener, addWindowStateListener, applyResourceBundle, applyResourceBundle, createBufferStrategy, createBufferStrategy, dispose, finalize, getAccessibleContext, getBufferStrategy, getFocusableWindowState, getFocusCycleRootAncestor, getFocusOwner, getFocusTraversalKeys, getGraphicsConfiguration, getInputContext, getListeners, getLocale, getMostRecentFocusOwner, getOwnedWindows, getOwner, getToolkit, getWarningString, getWindowFocusListeners, getWindowListeners, getWindowStateListeners, hide, isActive, isAlwaysOnTop, isFocusableWindow, isFocusCycleRoot, isFocused, isLocationByPlatform, isShowing, pack, postEvent, processEvent, processWindowEvent, processWindowFocusEvent, processWindowStateEvent, removeWindowFocusListener, removeWindowListener, removeWindowStateListener, setAlwaysOnTop, setBounds, setCursor, setFocusableWindowState, setFocusCycleRoot, setLocationByPlatform, setLocationRelativeTo, show, toBack, toFront

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

OPTION_CANCEL

public static final int **OPTION_CANCEL**

the cancel option for this dialog, dont save the component

OPTION_ACCEPT

public static final int **OPTION_ACCEPT**

(continued from last page)

the accept option for this dialog, save the component

Constructors

NewComponentDialog

```
public NewComponentDialog(Gui gui,
                          HashSet inputs,
                          HashSet outputs)
```

Creates new form NewComponentDialog

Parameters:

`gui` - the gui
`inputs` - the collection of input components
`outputs` - the collection of output components

Methods

showDialog

```
public int showDialog()
```

Displays the dialog for the user.

Returns:

the user's response, either `ACCEPT`or `CANCEL`

---

getComponentName

```
public String getComponentName()
```

Returns the plain english name the user entered for the component.

Returns:

the name

---

getImage

```
public Image getImage()
```

Returns the image the user selected to represent the component

Returns:

the image

---

getInputPins

```
public ArrayList getInputPins()
```

Returns an array of the custom component's input pins.

Returns:

the array of input pins (instances of PlaceholderPin)

See Also:

`PlaceholderPin`

(continued from last page)

getOutputPins

`public ArrayList` **`getOutputPins`**`()`

Returns an array of the custom component's output pins.

Returns:

the array of output pins (instances of PlaceholderPin)

See Also:

`PlaceholderPin`

gui
Class Nor2Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nor2Image
```

public class **Nor2Image**
extends ComponentImage

`Nor2Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nor2Gate.

See Also:
Nor3Image, Nor4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nor2Image()` Creates a new instance of Nor2Image, used by Toybox
`public`	`Nor2Image(Gui gui,Point location)` Constructs a new instance of `Nor2Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the or gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nor2Image

```
public Nor2Image()
```

Creates a new instance of Nor2Image, used by Toybox

Nor2Image

```
public Nor2Image(Gui gui,
                 Point location)
```

Constructs a new instance of `Nor2Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the or gate, for use in the toybox.

Returns:

the string `"NOR (2)"`

gui
Class Nor3Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nor3Image
```

public class **Nor3Image**
extends ComponentImage

`Nor3Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nor3Gate.

See Also:
Nor2Image, Nor4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nor3Image()` Constructs a new instance of `Nor3Image`, used by the toybox.
`public`	`Nor3Image(Gui gui,Point location)` Constructs a new instance of `Nor3Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nor3Image

```
public Nor3Image()
```

Constructs a new instance of `Nor3Image`, used by the toybox.

Nor3Image

```
public Nor3Image(Gui gui,
                 Point location)
```

Constructs a new instance of `Nor3Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"NOR (3)"`

gui
Class Nor4Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Nor4Image
```

public class **Nor4Image**
extends ComponentImage

`Nor4Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Nor4Gate.

See Also:
Nor2Image, Nor3Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Nor4Image()` Constructs a new instance of `Nor4Image`, used by the toybox.
`public`	`Nor4Image(Gui gui,Point location)` Constructs a new instance of `Nor4Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Nor4Image

```
public Nor4Image()
```

Constructs a new instance of `Nor4Image`, used by the toybox.

Nor4Image

```
public Nor4Image(Gui gui,
                 Point location)
```

Constructs a new instance of `Nor4Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"NOR (4)"`

gui
Class NotImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.NotImage
```

public class **NotImage**
extends ComponentImage

The gui part of a NOT gate.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`NotImage()` Constructs a new instance of `NotImage`, used by the toybox.
`public`	`NotImage(Gui gui,Point location)` Constructs a new instance of `NotImage`with a given location in the sandbox.

Method Summary

String	getTypeString() Returns a string that uniquely identifies each NotImageobject as a not gate.
String	toString() Returns the plain english name of the not gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

NotImage

`public NotImage()`

Constructs a new instance of `NotImage`, used by the toybox.

NotImage

`public NotImage(Gui gui, Point location)`

Constructs a new instance of `NotImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

`public String getTypeString()`

Returns a string that uniquely identifies each `NotImage`object as a not gate.

Returns:

the identifying string

toString

`public String toString()`

Returns the plain english name of the not gate, for use in the toybox.

Returns:

the string `"NOT"`

gui
Class Or2Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Or2Image
```

public class **Or2Image**
extends ComponentImage

`Or2Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Or2Gate.

See Also:
Or3Image, Or4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Or2Image()` Constructs a new instance of `Or2Image`, used by the toybox.
`public`	`Or2Image(Gui gui,Point location)` Constructs a new instance of `Or2Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the or gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Or2Image

```
public Or2Image()
```

Constructs a new instance of `Or2Image`, used by the toybox.

Or2Image

```
public Or2Image(Gui gui,
                Point location)
```

Constructs a new instance of `Or2Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the or gate, for use in the toybox.

Returns:

the string `"OR (2)"`

gui
Class Or3Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Or3Image
```

public class **Or3Image**
extends ComponentImage

`Or3Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Or3Gate.

See Also:
Or2Image, Or4Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Or3Image()` Constructs a new instance of `Or3Image`, used by the toybox.
`public`	`Or3Image(Gui gui,Point location)` Constructs a new instance of `Or3Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Or3Image

```
public Or3Image()
```

Constructs a new instance of `Or3Image`, used by the toybox.

Or3Image

```
public Or3Image(Gui gui,
                Point location)
```

Constructs a new instance of `Or3Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"OR (3)"`

gui
Class Or4Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Or4Image
```

public class **Or4Image**
extends ComponentImage

`Or4Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Or4Gate.

See Also:
Or2Image, Or3Image

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Or4Image()` Constructs a new instance of `Or4Image`, used by the toybox.
`public`	`Or4Image(Gui gui,Point location)` Constructs a new instance of `Or4Image`with a given location in the sandbox.

Method Summary

String	getTypeString()
String	toString() Returns the plain english name of the and gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Or4Image

```
public Or4Image()
```

Constructs a new instance of `Or4Image`, used by the toybox.

Or4Image

```
public Or4Image(Gui gui,
                Point location)
```

Constructs a new instance of `Or4Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the and gate, for use in the toybox.

Returns:

the string `"OR (4)"`

gui
Class PlaceholderPin

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.PlaceholderPin
```

public class **PlaceholderPin**
extends JComponent

Represents the pin of a custom component before the component is created. Each input pin of a custom component is represented by exactly one output pin of an input component in the model, and each output pin of a custom component is represented by exactly one input pin of an output component in the model.

This class extends JComponent so it can be arranged visually by ComponentDesignPane when designing the custom component.

The relavent information stored in a PlaceHolderPin is:

- the input/output component and pin number thats the place holder for the custom component's pin
- the location of the pin on the custom component's image (use `getCenter`to retrieve it

Field Summary

`static final int`	`INPUT` the type of an input pin on the custom component Value: **`0`**
`int`	`leftClickedX` the x coordinate of the mouse when the left button was pressed (in screen units)
`int`	`leftClickedY` the y coordinate of the mouse when the left button was pressed (in screen units)
`static final int`	`OUTPUT` the type of an output pin on the custom component Value: **`1`**
`static final int`	`RADIUS` the radius of the pin Value: **`5`**

Fields inherited from class `javax.swing.JComponent`

`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	PlaceholderPin(ComponentDesignPane cdp,int type,LogicComponent lc,int x,int y) Constructs a new Pin.

Method Summary

void	centerAt(int x,int y) Centers the Pinat the given location.
Point	getCenter() Returns the location of the center of the pin, relative to the pinBounds rectangle of the parent ComponentDesignPane.
LogicComponent	getLogicComponent() Returns the logic component that is currently taking the place of the custom component pin.
void	paint(Graphics g) Draws the Pin.

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

leftClickedX

`protected int` **`leftClickedX`**

the x coordinate of the mouse when the left button was pressed (in screen units)

leftClickedY

`protected int` **`leftClickedY`**

the y coordinate of the mouse when the left button was pressed (in screen units)

INPUT

`public static final int` **`INPUT`**

the type of an input pin on the custom component

OUTPUT

`public static final int` **`OUTPUT`**

the type of an output pin on the custom component

RADIUS

`public static final int` **`RADIUS`**

the radius of the pin

Constructors

PlaceholderPin

```
public PlaceholderPin(ComponentDesignPane cdp,
                      int type,
                      LogicComponent lc,
                      int x,
                      int y)
```

Constructs a new Pin.

Parameters:

`cdp` - the parent ComponentDesignPane
`type` - the type of pin on the new custom component (input or output) (used by `paint()`)
`lc` - the logic component associated with it
`x` - the x coordinate of the center
`y` - the y coordinate of the center

Methods

getCenter

`public Point` **`getCenter`**`()`

(continued from last page)

Returns the location of the center of the pin, relative to the pinBounds rectangle of the parent ComponentDesignPane. Use this to get the location to be used for the custom component.

Returns:

the relative center point

---

centerAt

```
public void centerAt(int x,
                     int y)
```

Centers the `Pin`at the given location.

Parameters:

`x` - the x coordinate

`y` - the y coordinate

---

getLogicComponent

```
public LogicComponent getLogicComponent()
```

Returns the logic component that is currently taking the place of the custom component pin. A pin number is also needed.

Returns:

a logic component

---

paint

```
public void paint(Graphics g)
```

Draws the Pin.

Parameters:

`g` - the graphics to use

gui
Class Sandbox

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Sandbox
```

public class **Sandbox**
extends JComponent

Extends `JComponent`to provide a workspace for the visual circuit model. Onlu `Displayable`and `WireImage`objects may be added to the `Sandbox`class for painting.

Dragging component images to the outer edges (right and down) of the sandbox will cause the sandbox area to grow when the move is completed. Dragging objects away from the edges and toward the upper-left will caus the sandbox to shrink.

Multiple `Displayables` can be selected simultaneously by left-clicking and dragging a bounding box over the desired components. Clicking anywhere on the sandbox without dragging will unselect all `Displayables`.

`WireImages` are drawn directly on the sandbox `Graphics`object, due to their nature. If the sandbox is clicked on, it first checks if the click is on the segment of a wire so it can be selected/unselected.

Field Summary

static final int	`GRID_SIZE` the grid size in standard units Value: **10**

Fields inherited from class `javax.swing.JComponent`

`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`

`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

public	`Sandbox()` Do not use this constructor, it is for NetBeans compatibility only.
public	`Sandbox(Gui gui)` Constructs a new `Sandbox`object given a reference to the gui.

Method Summary

Component	`add(Component c)` Adds the `component`to the `sandbox`.
void	`paint(Graphics graphics)` Draws the component and all child components.
void	`remove(Component c)` Removes the `component`from the `sandbox`.
void	`removeAll()` Clears the sandbox of components and wires.
void	`resize()` Resizes the area of the sandbox to fit the layout of the circuits.
void	`saveImage(java.io.File file)` Writes an image of the sandbox contents to disk as a .PNG file.
void	`setShowGrid(boolean enabled)` Enables/disables drawing the grid.
void	`zoom()` Zooms the sandbox to the gui's current level of magnification.

Methods inherited from class `javax.swing.JComponent`

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

GRID_SIZE

`public static final int GRID_SIZE`

the grid size in standard units

Constructors

Sandbox

`public Sandbox()`

Do not use this constructor, it is for NetBeans compatibility only. Does not create a useful `Sandbox`object.

Sandbox

`public Sandbox(Gui gui)`

Constructs a new `Sandbox`object given a reference to the gui.

Parameters:

`gui` - the gui

Methods

setShowGrid

`public void setShowGrid(boolean enabled)`

Enables/disables drawing the grid.

Parameters:

`enabled` - set `true`to show the grid

paint

`public void paint(Graphics graphics)`

Draws the component and all child components.

Parameters:

`graphics` - the graphics to draw with

saveImage

`public void saveImage(java.io.File file) throws Exception`

Writes an image of the sandbox contents to disk as a .PNG file.

Parameters:

`file` - the image file to write

Throws:

`Exception` - if the file cannot be saved

resize

`public void resize()`

Resizes the area of the sandbox to fit the layout of the circuits.

zoom

`public void zoom()`

Zooms the sandbox to the gui's current level of magnification. The `zoom`command is passed to all objects contained in the sandbox so they can adjust their own size and location accordingly.

add

`public Component add(Component c)`

Adds the `component`to the `sandbox`.

Parameters:

`c` - component to add

Returns:

the component added

remove

`public void remove(Component c)`

Removes the `component`from the `sandbox`.

Parameters:

`c` - component to remove

removeAll

`public void removeAll()`

Clears the sandbox of components and wires.

gui
Class SimDelayDialog

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-java.awt.Window
            ┗-java.awt.Dialog
               ┗-javax.swing.JDialog
                  ┗-gui.SimDelayDialog
```

public class **SimDelayDialog**
extends JDialog

A dialog box for editing the signal propagation delay.

Fields inherited from class `javax.swing.JDialog`
`accessibleContext`, `rootPane`, `rootPaneCheckingEnabled`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`SimDelayDialog(Gui gui)` Creates new SimDelayDialog.

Method Summary

`long`	`showDialog()` Displays the dialog for the user.

Methods inherited from class `javax.swing.JDialog`
`addImpl, createRootPane, dialogInit, getAccessibleContext, getContentPane, getDefaultCloseOperation, getGlassPane, getJMenuBar, getLayeredPane, getRootPane, isDefaultLookAndFeelDecorated, isRootPaneCheckingEnabled, paramString, processWindowEvent, remove, setContentPane, setDefaultCloseOperation, setDefaultLookAndFeelDecorated, setGlassPane, setJMenuBar, setLayeredPane, setLayout, setRootPane, setRootPaneCheckingEnabled, update`

Methods inherited from class `java.awt.Dialog`
`addNotify, getAccessibleContext, getTitle, hide, isModal, isResizable, isUndecorated, paramString, setModal, setResizable, setTitle, setUndecorated, show`

Methods inherited from class `java.awt.Window`

addNotify, addPropertyChangeListener, addPropertyChangeListener, addWindowFocusListener, addWindowListener, addWindowStateListener, applyResourceBundle, applyResourceBundle, createBufferStrategy, createBufferStrategy, dispose, finalize, getAccessibleContext, getBufferStrategy, getFocusableWindowState, getFocusCycleRootAncestor, getFocusOwner, getFocusTraversalKeys, getGraphicsConfiguration, getInputContext, getListeners, getLocale, getMostRecentFocusOwner, getOwnedWindows, getOwner, getToolkit, getWarningString, getWindowFocusListeners, getWindowListeners, getWindowStateListeners, hide, isActive, isAlwaysOnTop, isFocusableWindow, isFocusCycleRoot, isFocused, isLocationByPlatform, isShowing, pack, postEvent, processEvent, processWindowEvent, processWindowFocusEvent, processWindowStateEvent, removeWindowFocusListener, removeWindowListener, removeWindowStateListener, setAlwaysOnTop, setBounds, setCursor, setFocusableWindowState, setFocusCycleRoot, setLocationByPlatform, setLocationRelativeTo, show, toBack, toFront

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SimDelayDialog

`public` **`SimDelayDialog`**`(Gui gui)`

Creates new SimDelayDialog.

Parameters:

`gui` - the gui

(continued from last page)

Methods

showDialog

`public long` **`showDialog`**`()`

Displays the dialog for the user.

Returns:

the user's response- the simulation delay in milliseconds

gui
Class SwitchImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.SwitchImage
```

public class **SwitchImage**
extends ComponentImage

The gui part of an ON/OFF switch.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`SwitchImage()` Creates a new instance of SwitchImage
`public`	`SwitchImage(Gui gui,Point location)` Constructs a new instance of `SwitchImage`with a given location in the sandbox.

Method Summary

byte	getState() Returns the state of the switch image. 0- Off1- On
String	getTypeString() Returns a string that uniquely identifies each SwithcImageobject as a toggle switch.
String	toString() Returns the plain english name of the switch, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

SwitchImage

`public SwitchImage()`

Creates a new instance of SwitchImage

SwitchImage

`public SwitchImage(Gui gui, Point location)`

Constructs a new instance of `SwitchImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getState

`public byte getState()`

Returns the state of the switch image. `0`- Off`1`- On

Returns:

the button's state

getTypeString

`public String getTypeString()`

Returns a string that uniquely identifies each `SwithcImage`object as a toggle switch.

Returns:

the identifying string

toString

`public String toString()`

Returns the plain english name of the switch, for use in the toybox.

Returns:

the string `"Toggle Switch"`

gui
Class Toybox

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-javax.swing.JTree
               ┗-gui.Toybox
```

All Implemented Interfaces:
PopupMenuListener, FocusListener, TreeSelectionListener, java.io.Serializable, MenuContainer, ImageObserver, java.io.Serializable, javax.accessibility.Accessible, Scrollable

---

public class **Toybox**
extends JTree
implements Scrollable, javax.accessibility.Accessible, java.io.Serializable, ImageObserver, MenuContainer, java.io.Serializable, TreeSelectionListener, FocusListener, PopupMenuListener

Extends `JTree`to display components in groups for the user to select and add to the `Sandbox`. `Toybox`also includes a pop-up menu that is activated by right clicking anywhere on the component.

Custom components can be added and removed from the "Custom Components" category in the list, using the pop-up menu. Additionally, all custom component files in the `components/`directory are automatically loaded into the list by the constructor.

Fields inherited from class `javax.swing.JTree`
`ANCHOR_SELECTION_PATH_PROPERTY`, `CELL_EDITOR_PROPERTY`, `CELL_RENDERER_PROPERTY`, `cellEditor`, `cellRenderer`, `editable`, `EDITABLE_PROPERTY`, `EXPANDS_SELECTED_PATHS_PROPERTY`, `INVOKES_STOP_CELL_EDITING_PROPERTY`, `invokesStopCellEditing`, `LARGE_MODEL_PROPERTY`, `largeModel`, `LEAD_SELECTION_PATH_PROPERTY`, `ROOT_VISIBLE_PROPERTY`, `rootVisible`, `ROW_HEIGHT_PROPERTY`, `rowHeight`, `SCROLLS_ON_EXPAND_PROPERTY`, `scrollsOnExpand`, `SELECTION_MODEL_PROPERTY`, `selectionModel`, `selectionRedirector`, `SHOWS_ROOT_HANDLES_PROPERTY`, `showsRootHandles`, `TOGGLE_CLICK_COUNT_PROPERTY`, `toggleClickCount`, `TREE_MODEL_PROPERTY`, `treeModel`, `treeModelListener`, `VISIBLE_ROW_COUNT_PROPERTY`, `visibleRowCount`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

public	`Toybox()` Constructs a new `Toybox`object.
public	`Toybox(Gui gui)` Constructs a new `Toybox`object, passing a reference to the `Gui`.

Method Summary

void	`focusGained(FocusEvent focusEvent)` Necessary for a `FocusListener`but not used.
void	`focusLost(FocusEvent focusEvent)` Called when the `Toybox`loses focus.
void	`loadComponent(String type)` Loads a custom component into the tree, given a type string of the component.
void	`loadComponentDialog()` Displays a dialog to load a custom component.
void	`popupMenuCanceled(PopupMenuEvent e)` Called when the pop-up menu has been cancelled.
void	`popupMenuWillBecomeInvisible(PopupMenuEvent e)` Called when the pop-up menu will become invisible.
void	`popupMenuWillBecomeVisible(PopupMenuEvent e)` Called when the pop-up menu will become visible.
void	`valueChanged(TreeSelectionEvent treeSelectionEvent)` Called when the selection changes.

Methods inherited from class `javax.swing.JTree`

addSelectionInterval, addSelectionPath, addSelectionPaths, addSelectionRow, addSelectionRows, addTreeExpansionListener, addTreeSelectionListener, addTreeWillExpandListener, cancelEditing, clearSelection, clearToggledPaths, collapsePath, collapseRow, convertValueToText, createTreeModel, createTreeModelListener, expandPath, expandRow, fireTreeCollapsed, fireTreeExpanded, fireTreeWillCollapse, fireTreeWillExpand, fireValueChanged, getAccessibleContext, getAnchorSelectionPath, getCellEditor, getCellRenderer, getClosestPathForLocation, getClosestRowForLocation, getDefaultTreeModel, getDescendantToggledPaths, getDragEnabled, getEditingPath, getExpandedDescendants, getExpandsSelectedPaths, getInvokesStopCellEditing, getLastSelectedPathComponent, getLeadSelectionPath, getLeadSelectionRow, getMaxSelectionRow, getMinSelectionRow, getModel, getNextMatch, getPathBetweenRows, getPathBounds, getPathForLocation, getPathForRow, getPreferredScrollableViewportSize, getRowBounds, getRowCount, getRowForLocation, getRowForPath, getRowHeight, getScrollableBlockIncrement, getScrollableTracksViewportHeight, getScrollableTracksViewportWidth, getScrollableUnitIncrement, getScrollsOnExpand, getSelectionCount, getSelectionModel, getSelectionPath, getSelectionPaths, getSelectionRows, getShowsRootHandles, getToggleClickCount, getToolTipText, getTreeExpansionListeners, getTreeSelectionListeners, getTreeWillExpandListeners, getUI, getUIClassID, getVisibleRowCount, hasBeenExpanded, isCollapsed, isCollapsed, isEditable, isEditing, isExpanded, isExpanded, isFixedRowHeight, isLargeModel, isPathEditable, isPathSelected, isRootVisible, isRowSelected, isSelectionEmpty, isVisible, makeVisible, paramString, removeDescendantSelectedPaths, removeDescendantToggledPaths, removeSelectionInterval, removeSelectionPath, removeSelectionPaths, removeSelectionRow, removeSelectionRows, removeTreeExpansionListener, removeTreeSelectionListener, removeTreeWillExpandListener, scrollPathToVisible, scrollRowToVisible, setAnchorSelectionPath, setCellEditor, setCellRenderer, setDragEnabled, setEditable, setExpandedState, setExpandsSelectedPaths, setInvokesStopCellEditing, setLargeModel, setLeadSelectionPath, setModel, setRootVisible, setRowHeight, setScrollsOnExpand, setSelectionInterval, setSelectionModel, setSelectionPath, setSelectionPaths, setSelectionRow, setSelectionRows, setShowsRootHandles, setToggleClickCount, setUI, setVisibleRowCount, startEditingAtPath, stopEditing, treeDidChange, updateUI

Methods inherited from class `javax.swing.JComponent`

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Toybox

`public Toybox()`

Constructs a new `Toybox`object. This constructor should not be called except by the `Toybox(Gui)`constructor.

Toybox

`public Toybox(Gui gui)`

Constructs a new `Toybox`object, passing a reference to the `Gui`. Call this constructor to create a new `Toybox`object.

Parameters:

`gui` - the gui

Methods

valueChanged

`public void valueChanged(TreeSelectionEvent treeSelectionEvent)`

Called when the selection changes. This method ensures that only component nodes may be selected and that only one at a time may be selected. The current working component in the gui (the one that can be added by clicking on the sandbox) is updated appropriately.

Parameters:

`treeSelectionEvent` - the tree selection event

focusGained

`public void focusGained(FocusEvent focusEvent)`

Necessary for a `FocusListener`but not used.

Parameters:

`focusEvent` - the focus event

focusLost

`public void focusLost(FocusEvent focusEvent)`

Called when the `Toybox`loses focus. Unselects the currently selected component if there was one.

Parameters:

`focusEvent` - the focus event

loadComponent

`public void loadComponent(String type)`

Loads a custom component into the tree, given a type string of the component. If the component can't be loaded, no error is given.

Parameters:

`type` - the component's type string

loadComponentDialog

`public void` **`loadComponentDialog`**`()`

Displays a dialog to load a custom component. If the file chosen is not within the `components/`directory tree, an error message is sent to the `gui`.

popupMenuCanceled

`public void` **`popupMenuCanceled`**`(PopupMenuEvent e)`

Called when the pop-up menu has been cancelled. Does nothing.

Parameters:

`e` - the pop-up event

popupMenuWillBecomeVisible

`public void` **`popupMenuWillBecomeVisible`**`(PopupMenuEvent e)`

Called when the pop-up menu will become visible. Does nothing.

Parameters:

`e` - the pop-up event

popupMenuWillBecomeInvisible

`public void` **`popupMenuWillBecomeInvisible`**`(PopupMenuEvent e)`

Called when the pop-up menu will become invisible. If a custom component was originally clicked on to make the pop-up appear, it will become unselected again to make its colored background disappear.

Parameters:

`e` - the pop-up event

gui
Class VccImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.VccImage
```

public class **VccImage**
extends ComponentImage

The gui part of a grounded terminal.

Fields inherited from class gui.ComponentImage
frame, IMAGE_PATH, inputPinLocations, inputPins, logicComponent, outputPinLocations, outputPins

Fields inherited from class gui.Displayable
COMPONENT, COMPONENT_PIN, gui, ignoreLeftMouse, leftClickedX, leftClickedY, prevLocation, selected, WIRE, WIRE_NODE

Fields inherited from class javax.swing.JComponent
accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component
BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	VccImage() Creates a new instance of VccImage
public	VccImage(Gui gui,Point location) Constructs a new instance of VccImagewith a given location in the sandbox.

Method Summary

String	getTypeString() Returns a string that uniquely identifies each VccImageobject as a grounded terminal.
String	toString() Returns the plain english name of the switch, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

VccImage

```
public VccImage()
```

Creates a new instance of VccImage

VccImage

```
public VccImage(Gui gui,
                Point location)
```

Constructs a new instance of `VccImage`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

Returns a string that uniquely identifies each `VccImage`object as a grounded terminal.

Returns:

the identifying string

toString

```
public String toString()
```

Returns the plain english name of the switch, for use in the toybox.

Returns:

the string `"Button"`

gui
Class WireImage

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.WireImage
```

public class **WireImage**
extends Displayable

The gui part of a wire. Includes a collection of wire nodes.

Fields inherited from class gui.Displayable
COMPONENT, COMPONENT_PIN, gui, ignoreLeftMouse, leftClickedX, leftClickedY, prevLocation, selected, WIRE, WIRE_NODE

Fields inherited from class javax.swing.JComponent
accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component
BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	WireImage(Gui gui) Creates a new instance of WireImage.

Method Summary

WireNode	addNodeToBack(int x,int y) Adds a new node at the sink end of the wire.
WireNode	addNodeToFront(int x,int y) Adds a new node at the source end of the wire.
void	addToSandbox(Sandbox sandbox) Adds the wire and its nodes to the sandbox.

Rectangle	`getBounds()` Returns the bounding rectangle for the wire that encompasses all points on the wire path including end points.
Color	`getColor()` Returns the wire's color.
int	`getDisplayableType()` Identifies `WireImage`objects as the `WIRE`type of `Displayable`.
ArrayList	`getNodes()` Returns a list of the wire nodes, in order from sink to source.
int	`getPathPosition(WireNode node)` Returns the position of a wire node in the path.
ArrayList	`getPoints()` Returns the coordinates of all the nodes and the starting and ending points of the wire.
Wire	`getWire()` Returns the corresponding logical `Wire`object.
void	`insertNodeAt(WireNode node,int position)` Inserts a node, splitting a segment of the path.
void	`removeFromSandbox(Sandbox sandbox)` Removes the wire and its nodes from the sandbox.
void	`removeNode(WireNode node)` Removes a node from the wire.
void	`setWire(Wire wire)` Sets the corresponding `wire`object in the model.
WireNode	`splitPathSegment(int segment,int x,int y)` Inserts a new node, splitting a segment of the path.

Methods inherited from class `gui.Displayable`

`addToSandbox`, `bringToFront`, `centerAt`, `displayableMouseDragged`, `displayableMousePressed`, `displayableMouseReleased`, `getDisplayableType`, `getStdCenter`, `getStdHeight`, `getStdLocation`, `getStdWidth`, `getStdX`, `getStdY`, `isSelected`, `removeFromSandbox`, `setSelected`, `setStdLocation`, `setStdLocation`, `setStdSize`, `setStdSize`, `setStdSize`, `shiftLocation`, `zoom`

Methods inherited from class `javax.swing.JComponent`

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class `java.awt.Container`

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class `java.awt.Component`

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

WireImage

public **WireImage**(Gui gui)

Creates a new instance of WireImage.

Parameters:

gui - the gui

(continued from last page)

Methods

getPoints

`public ArrayList getPoints()`

Returns the coordinates of all the nodes and the starting and ending points of the wire. Coordinates are in standard units.

Returns:

the list of coordinates from source to sink

---

getNodes

`public ArrayList getNodes()`

Returns a list of the wire nodes, in order from sink to source.

Returns:

the path node list

---

setWire

`public void setWire(Wire wire)`

Sets the corresponding `wire`object in the model. If the `wire`isn't already associated with this `wireImage`, it will be associatesd with this.

Parameters:

`wire` - the wire to set

---

getWire

`public Wire getWire()`

Returns the corresponding logical `Wire`object.

Returns:

the wire

---

getColor

`public Color getColor()`

Returns the wire's color.

Returns:

the color

---

addNodeToFront

`public WireNode addNodeToFront(int x, int y)`

Adds a new node at the source end of the wire. Location is in standard coordinates. If a node on this wire already exists at x, y no node will be added and `null`well be returned.

Parameters:

`x` - the x coordinate

`y` - the y coordinate

Returns:

the created node

addNodeToBack

```
public WireNode addNodeToBack(int x,
                              int y)
```

Adds a new node at the sink end of the wire. Location is in standard coordinates. If a node on this wire already exists at x, y then no node will be added and `null`will be returned.

Parameters:

`x` - the x coordinate
`y` - the y coordinate

Returns:

the created node

splitPathSegment

```
public WireNode splitPathSegment(int segment,
                                 int x,
                                 int y)
```

Inserts a new node, splitting a segment of the path. The location must be in standard coordinates. If a node on this wire already exists at x, y then no node will be added and `null`will be returned.

Parameters:

`segment` - the segment to split, base 0 starting from the source end
`x` - the x coordinate
`y` - the y coordinate

Returns:

the created node

insertNodeAt

```
public void insertNodeAt(WireNode node,
                         int position)
```

Inserts a node, splitting a segment of the path. This method differs from `splitPathSegment`in that it takes an existing node object and adds it to the path.

Parameters:

`node` - the node to add
`position` - the slot to insert the node at, base 0 from the source

getPathPosition

```
public int getPathPosition(WireNode node)
```

Returns the position of a wire node in the path. The positions are base 0 and start from the source end of the wire. This method is called by the wire node that wants to know its position, so call `wireNode.getPathPosition`instead.

Parameters:

`node` - the node to return the position of

Returns:

the node's position

removeNode

```
public void removeNode(WireNode node)
```

Removes a node from the wire.

(continued from last page)

Parameters:
`node` - the node to remove

getDisplayableType

`public int` **`getDisplayableType`**`()`

Identifies `WireImage`objects as the `WIRE`type of `Displayable`.

Returns:
`Displayable.WIRE`

addToSandbox

`public void` **`addToSandbox`**`(Sandbox sandbox)`

Adds the wire and its nodes to the sandbox.

Parameters:
`sandbox` - the sandbox

removeFromSandbox

`public void` **`removeFromSandbox`**`(Sandbox sandbox)`

Removes the wire and its nodes from the sandbox.

Parameters:
`sandbox` - the sandbox

getBounds

`public Rectangle` **`getBounds`**`()`

Returns the bounding rectangle for the wire that encompasses all points on the wire path including end points. The rectangle returned is in standard units.

Returns:
the bounding rectangle

gui
Class WireNode

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.WireNode
```

public class **WireNode**
extends Displayable

A node on a wire (away from input/output pins) that can be dragged to change the shape of a the wire.

Fields inherited from class gui.Displayable
COMPONENT, COMPONENT_PIN, gui, ignoreLeftMouse, leftClickedX, leftClickedY, prevLocation, selected, WIRE, WIRE_NODE

Fields inherited from class javax.swing.JComponent
accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component
BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Constructor Summary

public	WireNode(Gui gui,int x,int y,WireImage owner) Constructs a new WireNodeobject for the path of a wire.

Method Summary

void	addToSandbox(Sandbox sandbox) Adds the node to the sandbox.
int	getDisplayableType() Identifies ComponentPinobjects as the COMPONENT_PINtype of Displayable.
WireImage	getOwner() Returns the WireImageobject that owns this node.

int	getPathPosition() Returns the position of the in its owner's path.
void	paint(Graphics g) Paints the wire node.
void	removeFromSandbox(Sandbox sandbox) Removes the node from the sandbox.

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

WireNode

```
public WireNode(Gui gui,
                int x,
                int y,
                WireImage owner)
```

Constructs a new `WireNode`object for the path of a wire. The owner of a wire node is its wire image.

Parameters:

`gui` - the gui
`x` - the x coordinate of the center
`y` - the y coordinate of the center
`owner` - the wire to which this node belongs

Methods

getDisplayableType

```
public int getDisplayableType()
```

Identifies `ComponentPin`objects as the `COMPONENT_PIN`type of `Displayable`.

Returns:

`Displayable.COMPONENT_PIN`

---

getOwner

```
public WireImage getOwner()
```

Returns the `WireImage`object that owns this node.

Returns:

the node's owner

---

getPathPosition

```
public int getPathPosition()
```

Returns the position of the in its owner's path. The positions are base 0 and start from the source end of the wire.

Returns:

the node's position

---

addToSandbox

```
public void addToSandbox(Sandbox sandbox)
```

Adds the node to the sandbox.

Parameters:

`sandbox` - the sandbox

(continued from last page)

removeFromSandbox

`public void removeFromSandbox(Sandbox sandbox)`

Removes the node from the sandbox.

Parameters:

`sandbox` - the sandbox

---

paint

`public void paint(Graphics g)`

Paints the wire node.

Parameters:

`g` - the `Graphics`to be used

gui
Class Xor2Image

```
java.lang.Object
   ┗-java.awt.Component
      ┗-java.awt.Container
         ┗-javax.swing.JComponent
            ┗-gui.Displayable
               ┗-gui.ComponentImage
                  ┗-gui.Xor2Image
```

public class **Xor2Image**
extends ComponentImage

`Xor2Image`extends the abstract class `ComponentImage`, and is the gui counterpart to Xor2Gate.

Fields inherited from class `gui.ComponentImage`
`frame`, `IMAGE_PATH`, `inputPinLocations`, `inputPins`, `logicComponent`, `outputPinLocations`, `outputPins`

Fields inherited from class `gui.Displayable`
`COMPONENT`, `COMPONENT_PIN`, `gui`, `ignoreLeftMouse`, `leftClickedX`, `leftClickedY`, `prevLocation`, `selected`, `WIRE`, `WIRE_NODE`

Fields inherited from class `javax.swing.JComponent`
`accessibleContext`, `listenerList`, `TOOL_TIP_TEXT_KEY`, `ui`, `UNDEFINED_CONDITION`, `WHEN_ANCESTOR_OF_FOCUSED_COMPONENT`, `WHEN_FOCUSED`, `WHEN_IN_FOCUSED_WINDOW`

Fields inherited from class `java.awt.Component`
`BOTTOM_ALIGNMENT`, `CENTER_ALIGNMENT`, `LEFT_ALIGNMENT`, `RIGHT_ALIGNMENT`, `TOP_ALIGNMENT`

Constructor Summary

`public`	`Xor2Image()` Creates a new instance of Xor2Image, used by Toybox
`public`	`Xor2Image(Gui gui,Point location)` Constructs a new instance of `Xor2Image`with a given location in the sandbox.

Method Summary

`String`	`getTypeString()`

String	toString() Returns the plain english name of the or gate, for use in the toybox.

Methods inherited from class gui.ComponentImage

addToSandbox, bringToFront, centerAt, getAddingCursor, getCustomComponentPin, getDisplayableType, getIcon, getInputPin, getInputPinLocation, getLogicComponent, getOutputPin, getOutputPinLocation, getTypeString, loadImages, loadPinLocations, paint, removeFromSandbox, resetState, setCustomComponentPin, setLogicComponent, setState, shiftLocation

Methods inherited from class gui.Displayable

addToSandbox, bringToFront, centerAt, displayableMouseDragged, displayableMousePressed, displayableMouseReleased, getDisplayableType, getStdCenter, getStdHeight, getStdLocation, getStdWidth, getStdX, getStdY, isSelected, removeFromSandbox, setSelected, setStdLocation, setStdLocation, setStdSize, setStdSize, setStdSize, shiftLocation, zoom

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getAccessibleContext, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getAlignmentX, getAlignmentY, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getInsets, getLayout, getListeners, getMaximumSize, getMinimumSize, getMousePosition, getPreferredSize, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paint, paintComponents, paramString, preferredSize, print, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, removeNotify, setComponentZOrder, setFocusCycleRoot, setFocusTraversalKeys, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setFont, setLayout, transferFocusBackward, transferFocusDownCycle, update, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, addNotify, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, bounds, checkImage, checkImage, coalesceEvents, contains, contains, createImage, createImage, createVolatileImage, createVolatileImage, deliverEvent, disable, disableEvents, dispatchEvent, doLayout, enable, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getAccessibleContext, getAlignmentX, getAlignmentY, getBackground, getBounds, getBounds, getColorModel, getComponentAt, getComponentAt, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeys, getFocusTraversalKeysEnabled, getFont, getFontMetrics, getForeground, getGraphics, getGraphicsConfiguration, getHeight, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getListeners, getLocale, getLocation, getLocation, getLocationOnScreen, getMaximumSize, getMinimumSize, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPreferredSize, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getSize, getToolkit, getTreeLock, getWidth, getX, getY, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, invalidate, isBackgroundSet, isCursorSet, isDisplayable, isDoubleBuffered, isEnabled, isFocusable, isFocusCycleRoot, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isOpaque, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, layout, list, list, list, list, list, locate, location, lostFocus, minimumSize, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paint, paintAll, paramString, postEvent, preferredSize, prepareImage, prepareImage, print, printAll, processComponentEvent, processEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processKeyEvent, processMouseEvent, processMouseMotionEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removeNotify, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, repaint, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, reshape, resize, resize, setBackground, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setEnabled, setFocusable, setFocusTraversalKeys, setFocusTraversalKeysEnabled, setFont, setForeground, setIgnoreRepaint, setLocale, setLocation, setLocation, setMaximumSize, setMinimumSize, setName, setPreferredSize, setSize, setSize, setVisible, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle, update, validate

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Xor2Image

```
public Xor2Image()
```

Creates a new instance of Xor2Image, used by Toybox

Xor2Image

```
public Xor2Image(Gui gui,
                 Point location)
```

Constructs a new instance of `Xor2Image`with a given location in the sandbox.

Parameters:

`gui` - the gui
`location` - the location, in standard coordinates

Methods

getTypeString

```
public String getTypeString()
```

toString

```
public String toString()
```

Returns the plain english name of the or gate, for use in the toybox.

Returns:

the string `"XOR (2)"`

Package
controller

Executes commands issued by the GUI, such as making changes to the model or loading and saving data. Provides Undo functionality with the Command design pattern.

The main classes in the `controller`package are:
- `Controller`: Communicates between the gui and the model, and manages the collections of `Command`objects
- `Command`: The base class for creating commands

controller
Class AddComponent

```
java.lang.Object
   |-controller.Command
      |-controller.AddComponent
```

public class **AddComponent**
extends Command

Implements the action for adding a component to the sandbox.

Fields inherited from class `controller.Command`
`description`, `gui`, `model`

Constructor Summary

`public`	`AddComponent(Gui gui,Model model,String type,int x,int y)` Constructs a new `AddComponent`object.

Method Summary

`void`	`execute()` Executes the command.
`void`	`unexecute()` Unexecutes the command.

Methods inherited from class `controller.Command`
`getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

(continued from last page)

AddComponent

```
public AddComponent(Gui gui,
                    Model model,
                    String type,
                    int x,
                    int y)
```

Constructs a new `AddComponent`object. The component location is the upper left of the new component in standard coordinates.

Parameters:

`gui` - the gui
`model` - the model
`type` - the `TYPE_STRING`of the component to add
`x` - the x coordinate
`y` - the y coordinate

Methods

execute

```
public void execute()
```

Executes the command.

unexecute

```
public void unexecute()
```

Unexecutes the command.

controller
Class AddWire

```
java.lang.Object
   ┗-controller.Command
      ┗-controller.AddWire
```

public class **AddWire**
extends Command

Implements the action for connecting components with a wire. Handles both the gui and model aspects.

Fields inherited from class controller.Command
description, gui, model

Constructor Summary

public	AddWire(Gui gui,Model model,Wire wire) Constructs a new AddWirecommand.

Method Summary

void	execute() Executes the command.
void	unexecute() Unexecutes the command.

Methods inherited from class controller.Command
getDescription

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

AddWire

```
public AddWire(Gui gui,
               Model model,
               Wire wire)
```

Constructs a new AddWirecommand. The wire must have both ends set.

(continued from last page)

Parameters:

`gui` - the gui
`model` - the model
`wire` - the wire to be added

Methods

execute

`public void` **`execute`**`()`

Executes the command.

---

unexecute

`public void` **`unexecute`**`()`

Unexecutes the command.

controller
Class Command

```
java.lang.Object
   |
   +-controller.Command
```

Direct Known Subclasses:
AddComponent, AddWire, DeleteSelection, InsertWireNode, MoveSelection

---

public abstract class **Command**
extends Object

Performs operations on the data model. This class is the abstract super class for the concrete command classes, as specified by the Command design pattern. The `execute`method must be implemented to perform the subclass' operation, and the `unexecute` method must be implemented to undo whatever changes are made to the model.

Field Summary

`String`	`description` a brief description of the command
`Gui`	`gui` the gui
`Model`	`model` the model

Constructor Summary

`public`	`Command(Gui gui,Model model,String description)` Creates a new `Command`object.

Method Summary

`String`	`getDescription()` Gets a description of the command

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Fields

(continued from last page)

gui

```
protected gui.Gui gui
```

the gui

model

```
protected model.Model model
```

the model

description

```
protected java.lang.String description
```

a brief description of the command

Constructors

Command

```
public Command(Gui gui,
               Model model,
               String description)
```

Creates a new `Command`object.

Parameters:

`gui` - the gui
`model` - the model
`description` - a brief description of the command

Methods

getDescription

```
public String getDescription()
```

Gets a description of the command

Returns:

a brief description of the command

controller
Class Controller

```
java.lang.Object
   |
   +-controller.Controller
```

public class **Controller**
extends Object

Communicates between the model and gui.

Constructor Summary

public	`Controller()` Creates a new `Controller`object, then creates and registers itself with a new `Gui`and `Model`.

Method Summary

void	`addComponent(String type,int x,int y)` Creates a new `AddComponent`command object and executes it.
void	`addWire(Wire wire)` Creates a new `AddWire`command object and executes it.
boolean	`canModelBeAComponent()` Checks if the current model can be saved as a custom component.
boolean	`canRedo()` Returns `true`if commands are on the `redoStack`.
boolean	`canUndo()` Returns `true`if commands are on the `undoStack`.
void	`deleteSelection(ArrayList selection)` Creates a `DeleteSelection`object and executes it.
HashSet	`getInputComponents()` Returns the input components in the model.
Model	`getModel()` Returns the current working model.
HashSet	`getOutputComponents()` Returns the output components in the model.
long	`getSimDelay()` Returns the model's signal propagation delay in milliseconds.

void	`insertWireNode(WireImage wireImage,int segment,int x,int y)` Inserts a wire node into a segment of an existing wire's path.
boolean	`isModified()` Returns `null`if the model has been modified since it was created or loaded.
void	`loadModel(java.io.File file)` Loads a new model, discarding the old model object.
void	`loadToToybox(String type)` Instructs the toybox to load the specified component into its custom components category.
static void	`main(String[] args)` Start the Circuit Sandbox application by creating an instance of this class.
void	`newModel()` Creates a new model, discarding the old model object.
void	`redo()` Redoes the most recently undone command.
void	`repaintSandbox()` Instructs the gui to repaint its sandbox component.
void	`saveAsCustomComponent(java.io.File file,String name,Image image,ArrayList inputPins,ArrayList outputPins)` Saves the current model to disk as a custom component.
void	`saveModel(java.io.File file)` Saves the current model to disk.
void	`selectionMoved(ArrayList selection,int xShift,int yShift)` Creates a `MoveSelection`object and executes it.
void	`setModified(boolean modified)` Sets whether the model has been modified or not.
void	`setSimDelay(long delay)` Sets the model's signal propagation delay in milliseconds.
void	`startSimulation()` Starts the execution of the simulation.
void	`stopSimulation()` Stops the execution of the simulation.
void	`undo()` Undoes the most recent command.

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

Controller

`public Controller()`

Creates a new `Controller`object, then creates and registers itself with a new `Gui`and `Model`.

Methods

main

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

Start the Circuit Sandbox application by creating an instance of this class.

Parameters:

`args` - command line parameters (unused)

---

getModel

`public Model getModel()`

Returns the current working model.

Returns:

the model

---

newModel

`public void newModel()`

Creates a new model, discarding the old model object.

---

loadModel

`public void loadModel(java.io.File file)`
`  throws Exception`

Loads a new model, discarding the old model object. If an error occurs, it will be passed to `showError`and the old model will be left untouched.

Parameters:

`file` - the file to load

Returns:

`true`if the file was loaded successfully

---

saveModel

`public void saveModel(java.io.File file)`
`  throws Exception`

Saves the current model to disk. If an error occurs, it will be thrown as an exception.

Parameters:

`file` - the file to write

Throws:

(continued from last page)

`Exception -` if the file can't be written to disk

saveAsCustomComponent

```
public void saveAsCustomComponent(java.io.File file,
          String name,
          Image image,
          ArrayList inputPins,
          ArrayList outputPins)
  throws Exception
```

Saves the current model to disk as a custom component. If an error occurs, it will be thrown as an exception.

Parameters:

`file -` the custom component file to write
`name -` the english name of the component
`image -` the image of the component
`inputPins -` array of input pins (PlaceholderPin objects)
`outputPins -` array of output pins (PlaceholderPin objects)

Throws:

`Exception -` if the file can't be written to disk

canModelBeAComponent

```
public boolean canModelBeAComponent()
  throws Exception
```

Checks if the current model can be saved as a custom component. Called by the gui before showing the new custom component dialog.

Returns:

`true`if the model can be a custom component

getInputComponents

```
public HashSet getInputComponents()
```

Returns the input components in the model. This is used for the new custom component dialog in the gui.

Returns:

a set of logic components

getOutputComponents

```
public HashSet getOutputComponents()
```

Returns the output components in the model. This is used for the new custom component dialog in the gui.

Returns:

a set of logic components

loadToToybox

```
public void loadToToybox(String type)
```

Instructs the toybox to load the specified component into its custom components category.

Parameters:

`type -` the `typeString`of the component to load

(continued from last page)

repaintSandbox

`public void repaintSandbox()`

Instructs the gui to repaint its sandbox component. This is called to update the gui from the model during simultion mode.

isModified

`public boolean isModified()`

Returns `null`if the model has been modified since it was created or loaded. Always test this method before creating a new model or loading a saved model.

Returns:

the model's status

setModified

`public void setModified(boolean modified)`

Sets whether the model has been modified or not.

Parameters:

`modified` - if the model has been modified

canUndo

`public boolean canUndo()`

Returns `true`if commands are on the `undoStack`.

Returns:

`true`if a command can be undone

canRedo

`public boolean canRedo()`

Returns `true`if commands are on the `redoStack`.

Returns:

`true`if a command can be redone

undo

`public void undo()`

Undoes the most recent command.

redo

`public void redo()`

Redoes the most recently undone command.

startSimulation

`public void startSimulation()`

Starts the execution of the simulation.

(continued from last page)

stopSimulation

`public void stopSimulation()`

Stops the execution of the simulation.

getSimDelay

`public long getSimDelay()`

Returns the model's signal propagation delay in milliseconds.

Returns:
the delay

setSimDelay

`public void setSimDelay(long delay)`

Sets the model's signal propagation delay in milliseconds.

Parameters:
`delay` - the delay

selectionMoved

```
public void selectionMoved(ArrayList selection,
                           int xShift,
                           int yShift)
```

Creates a `MoveSelection`object and executes it. Distances are given in standard coordinates.

Parameters:
`selection` - the selection that was moved
`xShift` - the horizontal distance moved
`yShift` - the vertical distance moved

deleteSelection

`public void deleteSelection(ArrayList selection)`

Creates a `DeleteSelection`object and executes it.

Parameters:
`selection` - the selection that will be deleted

addComponent

```
public void addComponent(String type,
                         int x,
                         int y)
```

Creates a new `AddComponent`command object and executes it. The component location is the upper left of the new component in standard coordinates.

Parameters:
`type` - the `TYPE_STRING`of the component to add
`x` - the x coordinate
`y` - the y coordinate

(continued from last page)

addWire

```
public void addWire(Wire wire)
```

Creates a new `AddWire`command object and executes it.

Parameters:

`wire` - the wire to be created

---

insertWireNode

```
public void insertWireNode(WireImage wireImage,
          int segment,
          int x,
          int y)
```

Inserts a wire node into a segment of an existing wire's path. The location must be in standard coordinates.

Parameters:

`wireImage` - the wire image receiving the new node
`segment` - the segment to split, base 0 starting from the source
`x` - the x coordinate for the new node
`y` - the y coordinate for the new node

controller
Class DeleteSelection

```
java.lang.Object
   |-controller.Command
      |-controller.DeleteSelection
```

public class **DeleteSelection**
extends Command

Implements the actions for deleting all objects selected in the gui.

Fields inherited from class controller.Command
description, gui, model

Constructor Summary

public	DeleteSelection(Gui gui,Model model,ArrayList selection) Constructs a new DeleteSelectioncommand.

Method Summary

void	execute() Executes the command.
void	unexecute() Unexecutes the command.

Methods inherited from class controller.Command
getDescription

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

DeleteSelection

```
public DeleteSelection(Gui gui,
                       Model model,
                       ArrayList selection)
```

Constructs a new DeleteSelectioncommand.

(continued from last page)

Parameters:

`gui` - the gui
`model` - the model
`selection` - the collection of gui objects to delete

Methods

execute

`public void` **`execute`**`()`

Executes the command.

unexecute

`public void` **`unexecute`**`()`

Unexecutes the command.

controller
Class InsertWireNode

```
java.lang.Object
   |
   +-controller.Command
      |
      +-controller.InsertWireNode
```

public class **InsertWireNode**
extends Command

Implements the actions for adding a new node to a wire, splitting a segment.

Fields inherited from class `controller.Command`
`description`, `gui`, `model`

Constructor Summary

public	`InsertWireNode(Gui gui,WireImage wireImage,int segment,int x,int y)` Constructs a new `InsertWireNode`command object.

Method Summary

void	`execute()` Executes the command.
void	`unexecute()` Unexecutes the command.

Methods inherited from class `controller.Command`
`getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

(continued from last page)

InsertWireNode

```
public InsertWireNode(Gui gui,
                      WireImage wireImage,
                      int segment,
                      int x,
                      int y)
```

Constructs a new `InsertWireNode`command object.

Parameters:

`gui` - the gui
`wireImage` - the wire image object involved
`segment` - the segment to split, base 0 starting from the source
`x` - the x coordinate of the node
`y` - the y coordinate of the node

Methods

execute

```
public void execute()
```

Executes the command.

---

unexecute

```
public void unexecute()
```

Unexecutes the command.

controller
Class MoveSelection

```
java.lang.Object
   |
   +-controller.Command
      |
      +-controller.MoveSelection
```

public class **MoveSelection**
extends Command

Implements the action for a moving a selection.

Fields inherited from class controller.Command
description, gui, model

Constructor Summary

public	MoveSelection(Gui gui,ArrayList selection,int xShift,int yShift) Creates a new instance of MoveSelection.

Method Summary

void	execute() Executes the command.
void	unexecute() Unexecutes the command.

Methods inherited from class controller.Command
getDescription

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

MoveSelection

```
public MoveSelection(Gui gui,
                     ArrayList selection,
                     int xShift,
                     int yShift)
```

(continued from last page)

Creates a new instance of MoveSelection.

Methods

execute

`public void execute()`

Executes the command.

---

unexecute

`public void unexecute()`

Unexecutes the command.

Package
model

Contains the circuit model and implements logic for running the simulation.

The main classes in the `model`package are:
- `Model`: Contains the circuit model
- `LogicComponent`: The base class for creating components
- `Wire`: Represents the visual connection between two components

model
Class And2Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.And2Gate
```

public class **And2Gate**
extends LogicComponent

`And2Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a two-input AND gate.

See Also:
And3Gate, And4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **and2**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`And2Gate(Model model)` Constructs a solitary new `And2Gate`object.

Method Summary

`void`	`compute()` Computes the output of the AND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

And2Gate

`public And2Gate(Model model)`

Constructs a solitary new `And2Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the AND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `And2Gate`objects return `And2Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class And3Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.And3Gate
```

public class **And3Gate**
extends LogicComponent

`And3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a three-input AND gate.

See Also:
And2Gate, And4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **and3**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`And3Gate(Model model)` Constructs a solitary new `And3Gate`object.

Method Summary

`void`	`compute()` Computes the output of the AND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

```
public static final java.lang.String TYPE_STRING
```

used to identify And2Gateobjects

Constructors

And3Gate

```
public And3Gate(Model model)
```

Constructs a solitary new And3Gateobject.

Parameters:

model - the model

Methods

compute

```
protected void compute()
```

Computes the output of the AND gate based on the inputs. If the calculated value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

getTypeString

```
public String getTypeString()
```

Returns the identifying string for this type of LogicComponentobject. All And3Gateobjects return And3Gate.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class And4Gate

```
java.lang.Object
   |
   +-java.util.Observable
      |
      +-model.LogicComponent
         |
         +-model.And4Gate
```

public class **And4Gate**
extends LogicComponent

`And4Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a four-input AND gate.

See Also:
And2Gate, And3Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **and4**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`And4Gate(Model model)` Constructs a solitary new `And4Gate`object.

Method Summary

`void`	`compute()` Computes the output of the AND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

And4Gate

`public And4Gate(Model model)`

Constructs a solitary new `And4Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the AND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `And4Gate`objects return `And4Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Button

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Button
```

public class **Button**
extends LogicComponent

`Button`extends the abstract class `LogicComponent`, implementing the logic required to simulate a push button.

Field Summary

`static final String`	`TYPE_STRING` used to identify `Button`objects Value: **`button`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Button(Model model)` Constructs a solitary new `Button`object.

Method Summary

`void`	`compute()` Computes the output of the button based on the state of its corresponding gui object, `ButtonImage`.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`setState(byte s)` Switches the button off or on.

Methods inherited from class `model.LogicComponent`

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class java.util.Observable

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify Buttonobjects

Constructors

Button

public **Button**(Model model)

Constructs a solitary new Buttonobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Computes the output of the button based on the state of its corresponding gui object, ButtonImage. If the value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

setState

public void **setState**(byte s)

Switches the button off or on. Possible states are: 0- Off1- On

Parameters:

s - the state

(continued from last page)

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`object. All `Button`objects return `Button.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class CustomComponent

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.CustomComponent
```

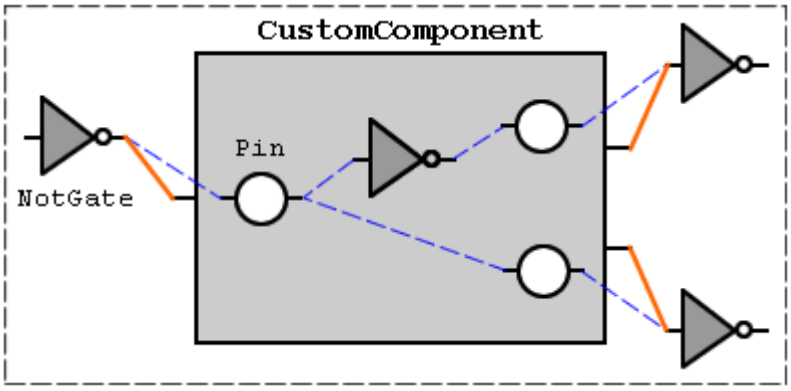
public class **CustomComponent**
extends LogicComponent

`CustomComponent`extends the abstract class `LogicComponent`and provides customizable functionality. The `CustomComponent` class is basically a container component with no logic functionality of its own. Each `CustomComponent`contains a collection of components (including other `CustomComponents`) that perform the logic displayed by their parent `CustomComponent`.

When an external component passes its output values to a `CustomComponent`, the values are transferred via special input `Pin` components to inputs of components inside the `CustomComponent`'s collection. When the last components inside the container update their outputs, the values are again transferred by output `Pin`components to the inputs of other components outside the `CustomComponent`.

Visually, external components are connected directly to the inputs and outputs of the `CustomComponent`object, but logically external source components are connected to internal input `Pin`components and internal output `Pin`components are connected to the external sink components.

Below is a diagram of a simple custom component. The blue dashed lines are logical connections and the solid orange lines are visual connections made with wires.



Field Summary

`static final String`	`TYPE_STRING` used to identify `CustomComponent`objects Value: **`custom`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

public	`CustomComponent(Model model,String filePath)` Constructs a solitary new `CustomComponent`object.

Method Summary

void	`compute()` Does nothing because custom components do not directly compute their output values.
void	`connectToInput(int inputNumber,LogicComponent source,int sourcePin)` Overrides `LogicComponent.connectToInput(int, LogicComponent, int)`.
void	`connectToInput(int inputNumber,LogicComponent source,int sourcePin,int wireId)` Overrides `LogicComponent.connectToInput(int, LogicComponent, int, int)`.
void	`connectToOutput(int outputNumber,LogicComponent sink,int sinkPin)` Overrides `LogicComponent.connectToOutput(int, LogicComponent, int)`.
void	`connectToOutput(int outputNumber,LogicComponent sink,int sinkPin,int wireId)` Overrides `LogicComponent.connectToOutput(int, LogicComponent, int, int)`.
void	`disconnectFromInput(int inputNumber)` Overrides `LogicComponent.disconnectFromInput(int)`.
void	`disconnectFromOutput(int outputNumber,LogicComponent sink,int sinkPin)` Overrides `LogicComponent.disconnectFromOutput(int, LogicComponent, int)`.
`LogicComponent.ConnectionPoint`	`getConnectionPointIn(int inputNumber)` Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired input pin.
`LogicComponent.ConnectionPoint`	`getConnectionPointOut(int outputNumber)` Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired output pin.
`Point[]`	`getInputLocations()` Returns the array of input pin locations.
`String`	`getName()` Returns the plain english name of the component.
`Point[]`	`getOutputLocations()` Returns the array of output pin locations.
`String`	`getPath()` Returns the component's file path as a string relative to the working directory.

String	getTypeString() Returns the identifying string for this type of LogicComponentand CustomComponentobject.
byte	getValueOfOutput(int outputNumber) Returns the output value of the custom component's pin object associated with the output number, since the custom component itself doesn't have output values.
void	resetState() Sets the values of all the output pins on the internal components to UNDEFINED.
static void	saveComponent(Model model,java.io.File file,String name,Image image,ArrayList inputPins,ArrayList outputPins) Saves all of the data necessary for a custom component to disk.

Methods inherited from class model.LogicComponent

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class java.util.Observable

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

```
public static final java.lang.String TYPE_STRING
```

used to identify CustomComponentobjects

Constructors

CustomComponent

```
public CustomComponent(Model model,
                       String filePath)
```

Constructs a solitary new CustomComponentobject.

Parameters:

model - the model

filePath - relative path of the file to be loaded

(continued from last page)

Throws:

`java.lang.Exception` - if the component file could not be loaded

Methods

connectToInput

```
public void connectToInput(int inputNumber,
          LogicComponent source,
          int sourcePin)
```

Overrides `LogicComponent.connectToInput(int, LogicComponent, int)`. The `CustomComponent`first connects the source component to itself, then connects the source to its internal input `Pin`component corresponding to the input number.

Parameters:

`inputNumber` - the input number on this component
`source` - the source component
`sourcePin` - the output pin number on the source component

---

connectToInput

```
public void connectToInput(int inputNumber,
          LogicComponent source,
          int sourcePin,
          int wireId)
```

Overrides `LogicComponent.connectToInput(int, LogicComponent, int, int)`. The `CustomComponent`first connects the source component to itself visually, then makes a logical connection from the source to its internal input `Pin`component corresponding to the input number.

Parameters:

`inputNumber` - the input number on this component
`source` - the source component
`sourcePin` - the output pin number on the source component
`wireId` - the id number of the `wire`representing this connection

---

disconnectFromInput

```
public void disconnectFromInput(int inputNumber)
```

Overrides `LogicComponent.disconnectFromInput(int)`. The `CustomComponent`first disconnects from its own internal input `Pin`component corresponding to the input number, then disconnects from itself.

Parameters:

`inputNumber` - the input pin number to disconnect

---

connectToOutput

```
public void connectToOutput(int outputNumber,
          LogicComponent sink,
          int sinkPin)
```

Overrides `LogicComponent.connectToOutput(int, LogicComponent, int)`. The `CustomComponent`first connects the sink component to itself, then connects the sink to its internal output `Pin`component corresponding to the output number.

Parameters:

`outputNumber` - the output number on this component
`sink` - the sink component
`sinkPin` - the input pin number on the sink component

connectToOutput

```
public void connectToOutput(int outputNumber,
                            LogicComponent sink,
                            int sinkPin,
                            int wireId)
```

Overrides `LogicComponent.connectToOutput(int, LogicComponent, int, int)`. The `CustomComponent`first connects the sink component to itself visually, then makes a logical connection from the sink to its internal output `Pin`component corresponding to the output number.

Parameters:

`outputNumber` - the output number on this component
`sink` - the sink component
`sinkPin` - the input pin number on the sink component
`wireId` - the id number of the `wire`representing this connection

disconnectFromOutput

```
public void disconnectFromOutput(int outputNumber,
                                 LogicComponent sink,
                                 int sinkPin)
```

Overrides `LogicComponent.disconnectFromOutput(int, LogicComponent, int)`. The `CustomComponent`first disconnects from its own internal output `Pin`component corresponding to the output number, then disconnects from itself.

Parameters:

`outputNumber` - the output pin number to disconnect
`sink` - the sink `LogicComponent`being disconnected from
`sinkPin` - the input pin number on the sink `LogicComponent`

getConnectionPointIn

```
protected LogicComponent.ConnectionPoint getConnectionPointIn(int inputNumber)
```

Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired input pin.

Parameters:

`inputNumber` - the input pin number to connect to

Returns:

the `ConnectionPoint`

getConnectionPointOut

```
protected LogicComponent.ConnectionPoint getConnectionPointOut(int outputNumber)
```

Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired output pin.

Parameters:

`outputNumber` - the output pin number to connect to

Returns:

the `ConnectionPoint`

getValueOfOutput

```
public byte getValueOfOutput(int outputNumber)
```

Returns the output value of the custom component's pin object associated with the output number, since the custom component itself doesn't have output values.

Parameters:

(continued from last page)

`outputNumber` - the output number to get the value from

Returns:
the output value (`TRUE`| `FALSE`| `UNDEFINED`)

---

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`and `CustomComponent`object. The string preceding the colon character identifies this object as a `CustomComponent`, and the string following the colon identifies the file that this CustomComponent was loaded from.

Returns:
the object's type-identifying string

---

getName

`public String` **`getName`**`()`

Returns the plain english name of the component.

Returns:
the component name

---

getPath

`public String` **`getPath`**`()`

Returns the component's file path as a string relative to the working directory.

Returns:
the path string

---

getInputLocations

`public Point[]` **`getInputLocations`**`()`

Returns the array of input pin locations. Used by the gui custom component images.

Returns:
the array of input pin locations

---

getOutputLocations

`public Point[]` **`getOutputLocations`**`()`

Returns the array of output pin locations. Used by the gui custom component images.

Returns:
the array of output pin locations

---

compute

`public void` **`compute`**`()`

Does nothing because custom components do not directly compute their output values. This method should never be called.

---

resetState

`public void` **`resetState`**`()`

(continued from last page)

Sets the values of all the output pins on the internal components to `UNDEFINED`. Call this method to reset the state of each component after running the simulation.

saveComponent

```
public static void saveComponent(Model model,
         java.io.File file,
         String name,
         Image image,
         ArrayList inputPins,
         ArrayList outputPins)
  throws Exception
```

Saves all of the data necessary for a custom component to disk. An XML file containing the model data will be written, as well as a .png image file of the specified image for the component.

Parameters:

`model` - the model
`file` - the custom component file to write (.csc)
`name` - the english name of the component
`image` - the image representing the component
`inputPins` - the array of Pin objects that will be custom component input pins
`outputPins` - the array of Pin objects that will be custom component output pins

Throws:

`Exception` - if the file could not be written

model
Class DFlipFlop

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.DFlipFlop
```

public class **DFlipFlop**
extends LogicComponent

`DFlipFlopGate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a D Flip-Flop.

Field Summary

`static final String`	`TYPE_STRING` used to identify `DFlipFlopGate`objects Value: **`dflipflop`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`DFlipFlop(Model model)` Constructs a solitary new `DFlipFlopGate`object.

Method Summary

`void`	`compute()` Computes the output of the AND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`resetState()` Resets the state of the Flip-Flop to undefined when the simulation is stopped.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `DFlipFlopGate`objects

Constructors

DFlipFlop

`public DFlipFlop(Model model)`

Constructs a solitary new `DFlipFlopGate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the AND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `DFlipFlopGate`objects return `DFlipFlopGate.TYPE_STRING`.

Returns:

the object's type-identifying string

resetState

`public void resetState()`

Resets the state of the Flip-Flop to undefined when the simulation is stopped.

model
Class Ground

```
java.lang.Object
   ┣-java.util.Observable
      ┣-model.LogicComponent
         ┣-model.Ground
```

public class **Ground**
extends LogicComponent

`Ground`extends the abstract class `LogicComponent`, implementing the logic required to simulate a grounded terminal.

Field Summary

`static final String`	`TYPE_STRING` used to identify `Button`objects Value: **`ground`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Ground(Model model)` Constructs a solitary new `Ground`object.

Method Summary

`void`	`compute()` If the output value isn't `FALSE`yet, a `State`object is created and put on the `model`'s queue to change the output value to `FALSE`later.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`setState(byte s)` Sends the initial signal from the grounded terminal.

Methods inherited from class `model.LogicComponent`

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class `java.util.Observable`

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String` **`TYPE_STRING`**

used to identify `Button`objects

Constructors

Ground

`public` **`Ground`**`(Model model)`

Constructs a solitary new `Ground`object.

Parameters:

`model` - the model

Methods

compute

`protected void` **`compute`**`()`

If the output value isn't `FALSE`yet, a `State`object is created and put on the `model`'s queue to change the output value to `FALSE`later.

setState

`public void` **`setState`**`(byte s)`

Sends the initial signal from the grounded terminal. The state is not applicable to this type of input component.

Parameters:

`s` - *unused*

(continued from last page)

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`object. All `Ground`objects return `Switch.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class HexDigit

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.HexDigit
```

public class **HexDigit**
extends LogicComponent

`HexDigit`extends the abstract class `LogicComponent`, implementing the logic required to simulate a display capable of showing a four bit number in hexadecimal.

Field Summary

`static final String`	`TYPE_STRING` used to identify `HexDigit`objects Value: **`hexdigit`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`HexDigit(Model model)` Constructs a solitary new `HexDigit`object.

Method Summary

`void`	`compute()` Updates the component image's state based on the input values.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class `java.util.Observable`

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify HexDigitobjects

Constructors

HexDigit

public **HexDigit**(Model model)

Constructs a solitary new HexDigitobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Updates the component image's state based on the input values. No outputs are computed because hex digits don't have any. Changing the state of the HexDigit image will cause it to update its frame and repaint;

getTypeString

public String **getTypeString**()

Returns the identifying string for this type of LogicComponentobject. All Buttonobjects return HexDigit.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class JKFlipFlop

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.JKFlipFlop
```

public class **JKFlipFlop**
extends LogicComponent

`JKFlipFlopGate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a JK Flip-Flop.

Field Summary

`static final String`	`TYPE_STRING` used to identify `JKFlipFlopGate`objects Value: **`jkflipflop`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`JKFlipFlop(Model model)` Constructs a solitary new `JKFlipFlopGate`object.

Method Summary

`void`	`compute()` Computes the output of the AND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`resetState()` Resets the state of the Flip-Flop to undefined when the simulation is stopped.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `JKFlipFlopGate`objects

Constructors

JKFlipFlop

`public JKFlipFlop(Model model)`

Constructs a solitary new `JKFlipFlopGate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the AND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `JKFlipFlopGate`objects return `JKFlipFlopGate.TYPE_STRING`.

Returns:

the object's type-identifying string

resetState

`public void resetState()`

Resets the state of the Flip-Flop to undefined when the simulation is stopped.

model
Class LED

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.LED
```

public class **LED**
extends LogicComponent

LEDextends the abstract class LogicComponent, implementing the logic required to simulate a light-emitting diode.

Field Summary

static final String	TYPE_STRING used to identify LEDobjects Value: **LED**

Fields inherited from class model.LogicComponent

componentImage, FALSE, id, INPUT, inputs, LOGIC, model, newOutputValues, OUTPUT, outputs, outputValues, TRUE, UNDEFINED

Constructor Summary

public	LED(Model model) Constructs a solitary new LEDobject.

Method Summary

void	compute() Updates the component image's state based on the input value.
String	getTypeString() Returns the identifying string for this type of LogicComponentobject.

Methods inherited from class model.LogicComponent

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class java.util.Observable

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify LEDobjects

Constructors

LED

public **LED**(Model model)

Constructs a solitary new LEDobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Updates the component image's state based on the input value. No outputs are computed because an LED doesn't have any. Changing the state of the LED image will cause it to update its frame and repaint;

getTypeString

public String **getTypeString**()

Returns the identifying string for this type of LogicComponentobject. All LEDobjects return LED.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class LogicComponent

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
```

All Implemented Interfaces:
Cloneable, Observer

Direct Known Subclasses:
And2Gate, And3Gate, And4Gate, Button, CustomComponent, DFlipFlop, Ground, HexDigit, JKFlipFlop, LED, Nand2Gate, Nand3Gate, Nand4Gate, Nor2Gate, Nor3Gate, Nor4Gate, NotGate, Or2Gate, Or3Gate, Or4Gate, Switch, Vcc, Xor2Gate

---

public abstract class **LogicComponent**
extends Observable
implements Observer, Cloneable

`LogicComponent`is the abstract class that all components extend. Components basically read values on their input pins, compute their output values, and then notify the components connected to theiroutputs that they need to recalculate as well.

`LogicComponent`objects extend the Java `Observable`class and implement the `Observer`interface so that each component can observe other components and be observed.

Values (`TRUE | FALSE | UNDEFINED`) propagate through connected components using their observer/observable properties. When a component is notified by one of its observables, it checks its inputs, computes its outputs and notifies its observers.

To connect two `LogicComponents`(designated "source" and "sink"), the `connectToOutput`method of the source component and the `connectToInput`method of the sink component must both be called. The order in which they are called doesn't matter.

There are two types of connections that can be made between components. The first type of connection is referred to as a logical connection, simply meaning the sink component becomes an observer of the source component and they pass values. This type of connection is used inside a custom component where the internal components and their connections are not visible to the user. Use the `connectToInput(int, LogicComponent, int)`and `connectToOutput(int, LogicComponent, int)`methods to do this.

The second type of connection is referred to as a visual connection. This type of connection implies a logical connection, but a `Wire`object is used in the connection also. Users can see visual connections on the screen in the form of wires drawn between two component images. Use the `connectToInput(int, LogicComponent, int, int)`and `connectToOutput(int, LogicComponent, int, int)`methods to do this. Note that the `Wire`object must already exist in the model before creating the visual connection.

See Also:
Wire

Field Summary

`ComponentImage`	`componentImage` the corresponding visual image of the component

static final byte	FALSE a LogicComponent's boolean False value Value: **0**
int	id the unique id of the component in the model
static final int	INPUT a component's function if it has no outputs Value: **1**
ConnectionPoint[]	inputs an array of input ConnectionPointsrepresenting incoming connections from other components
static final int	LOGIC a component's function if it has inputs and outputs Value: **3**
Model	model the model
byte[]	newOutputValues an array with the ouput value used in the most recently created state change object for each output
static final int	OUTPUT a component's function if it has no inputs Value: **2**
ArrayList[]	outputs an array of collections that contain output ConnectionPointsrepresenting outgoing connections to other components
byte[]	outputValues an array of the currently computed output values
static final byte	TRUE a LogicComponent's boolean True value Value: **1**
static final byte	UNDEFINED a LogicComponent's undefined boolean value Value: **-1**

Constructor Summary

public	LogicComponent() Empty constructor used only when a component doesn't know how many inputs and outputs it will have.

public	`LogicComponent(Model model,int numberOfInputs,int numberOfOutputs)` Initializes a new `LogicComponent`object.

Method Summary

abstract void	`compute()` This method is called when the `LogicComponent`is notified that one of its input values has changed.
void	`connectToInput(int inputNumber,LogicComponent source,int sourcePin)` Makes a connection from an input pin on this component to the given output pin on another `LogicComponent`.
void	`connectToInput(int inputNumber,LogicComponent source,int sourcePin,int wireId)` Makes a connection from an input pin on this component to the given output pin on another `LogicComponent`.
void	`connectToOutput(int outputNumber,LogicComponent sink,int sinkPin)` Makes a connection from an output pin on this component to the given input pin on another `LogicComponent`.
void	`connectToOutput(int outputNumber,LogicComponent sink,int sinkPin,int wireId)` Makes a connection from an output pin on this component to the given input pin on another `LogicComponent`.
void	`disconnectFromInput(int inputNumber)` Breaks the connection from a given input pin on this component to another `LogicComponent`.
void	`disconnectFromOutput(int outputNumber,LogicComponent sink,int sinkPin)` Breaks the connection from a given output pin on this component to another `LogicComponent`.
LogicComponent	`getClone()` Returns a copy of this logic component.
ComponentImage	`getComponentImage()` Returns the logic component's corresponding visual `ComponentImage`that is used by the gui.
LogicComponent.ConnectionPoint	`getConnectionPointIn(int inputNumber)` Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired input pin.
LogicComponent.ConnectionPoint	`getConnectionPointOut(int outputNumber)` Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired output pin.
int	`getFunction()` Returns the function of the component in a circuit.
int	`getId()` Returns the id number of this component.

LogicComponent.ConnectionPoint[]	getInputConnections() Returns an array of the component's input ConnectionPoints.
int	getNumberOfInputs() Returns the number of inputs this component has.
int	getNumberOfOutputs() Returns the number of outputs this component has.
abstract String	getTypeString() Returns a string that uniquely identifies each type of LogicComponent.
byte	getValueOfInput(int inputNumber) Returns the value of a given input by checked the connected source component's output pin.
byte	getValueOfOutput(int outputNumber) Returns the computed value of an output, given an output pin number.
HashSet	getWires() Returns a collection of all the IDs of the wires attached to the componenent.
boolean	isASink(LogicComponent lc) Returns trueif a given LogicComponentis attached to an output on this component.
boolean	isInputAvailable(int pinNumber) Returns trueif the specified input pin has not connected to anything.
void	resetState() Sets the values of all the output pins to UNDEFINED.
void	setComponentImage(ComponentImage componentImage) Sets the logic component's corresponding visual ComponentImagethat is used by the gui.
void	setId(int id) Sets the id number of this component.
void	setState(byte s) Sets the state of the component.
void	setValueOfOutput(int outputNumber,byte value) Sets the value of a given output pin and notifies all observing LogicComponents.
void	update(Observable observerable,Object o) Called when a LogicComponentthat this component was observing has updated its output values.

Methods inherited from class java.util.Observable

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

model

protected model.Model **model**

the model

id

protected int **id**

the unique id of the component in the model

inputs

protected model.LogicComponent.ConnectionPoint **inputs**

an array of input ConnectionPointsrepresenting incoming connections from other components

outputs

protected java.util.ArrayList **outputs**

an array of collections that contain output ConnectionPointsrepresenting outgoing connections to other components

outputValues

protected byte **outputValues**

an array of the currently computed output values

newOutputValues

protected byte **newOutputValues**

an array with the ouput value used in the most recently created state change object for each output

componentImage

protected gui.ComponentImage **componentImage**

the corresponding visual image of the component

FALSE

public static final byte **FALSE**

a LogicComponent's boolean False value

TRUE

public static final byte **TRUE**

a LogicComponent's boolean True value

UNDEFINED

`public static final byte` **`UNDEFINED`**

a `LogicComponent`'s undefined boolean value

INPUT

`public static final int` **`INPUT`**

a component's function if it has no outputs

OUTPUT

`public static final int` **`OUTPUT`**

a component's function if it has no inputs

LOGIC

`public static final int` **`LOGIC`**

a component's function if it has inputs and outputs

Constructors

LogicComponent

`public` **`LogicComponent`**`()`

Empty constructor used only when a component doesn't know how many inputs and outputs it will have. `CustomComponent`objects use this constructor.

See Also:

`CustomComponent`

LogicComponent

```
public LogicComponent(Model model,
                      int numberOfInputs,
                      int numberOfOutputs)
```

Initializes a new `LogicComponent`object.

Parameters:

`model` - the model
`numberOfInputs` - the number of input pins
`numberOfOutputs` - the number of output pins

Methods

setId

`public void` **`setId`**`(int id)`

Sets the id number of this component.

Parameters:

`id` - the id number

(continued from last page)

getId

`public int` **`getId`**`()`

Returns the id number of this component.

Returns:

the id number

getNumberOfInputs

`public int` **`getNumberOfInputs`**`()`

Returns the number of inputs this component has.

Returns:

the number of inputs

getNumberOfOutputs

`public int` **`getNumberOfOutputs`**`()`

Returns the number of outputs this component has.

Returns:

the number of outputs

setComponentImage

`public void` **`setComponentImage`**`(ComponentImage componentImage)`

Sets the logic component's corresponding visual `ComponentImage`that is used by the gui. This method will also call the `setLogicComponent`method of the component image so that only one calls needs to be made to create the association.

Parameters:

`componentImage` - the component image

getComponentImage

`public ComponentImage` **`getComponentImage`**`()`

Returns the logic component's corresponding visual `ComponentImage`that is used by the gui.

Returns:

the component image object

connectToInput

```
public void connectToInput(int inputNumber,
          LogicComponent source,
          int sourcePin)
```

Makes a connection from an input pin on this component to the given output pin on another `LogicComponent`. The connection is logical only and does not have a wire visually representing it. The connection created by calling this method is unidirectional, so the `connectToOutput(int, LogicComponent, int)`method of the source component must also be called to connect this component to it. The order in which these two methods are called to create a connect doesn't matter.

Parameters:

`inputNumber` - the input number on this component
`source` - the source component
`sourcePin` - the output pin number on the source component

connectToInput

```
public void connectToInput(int inputNumber,
          LogicComponent source,
          int sourcePin,
          int wireId)
```

Makes a connection from an input pin on this component to the given output pin on another `LogicComponent`. The `Wire`object with the given `wireId`will visually represent the connection. The connection created by calling this method is unidirectional, so the `connectToOutput(int, LogicComponent, int, int)`method of the source component must also be called to connect this component to it. The order in which these two methods are called to create a connect doesn't matter.

Parameters:

`inputNumber` - the input number on this component
`source` - the source component
`sourcePin` - the output pin number on the source component
`wireId` - the id number of the `wire`representing this connection

disconnectFromInput

```
public void disconnectFromInput(int inputNumber)
```

Breaks the connection from a given input pin on this component to another `LogicComponent`. The `disconnectFromOutput`method of the source component must also be called to break the other end of the connection.

Parameters:

`inputNumber` - the input pin number to disconnect

connectToOutput

```
public void connectToOutput(int outputNumber,
          LogicComponent sink,
          int sinkPin)
```

Makes a connection from an output pin on this component to the given input pin on another `LogicComponent`. The connection is logical only and does not have a wire visually representing it. The connection created by calling this method is unidirectional, so the `connectToInput(int, LogicComponent, int)`method of the sink component must also be called to connect this component to it. The order in which these two methods are called to create a connect doesn't matter.

Parameters:

`outputNumber` - the output number on this component
`sink` - the sink component
`sinkPin` - the input pin number on the sink component

connectToOutput

```
public void connectToOutput(int outputNumber,
          LogicComponent sink,
          int sinkPin,
          int wireId)
```

Makes a connection from an output pin on this component to the given input pin on another `LogicComponent`. The `Wire`object with the given `wireId`will visually represent the connection. The connection created by calling this method is unidirectional, so the `connectToInput(int, LogicComponent, int, int)`method of the sink component must also be called to connect this component to it. The order in which these two methods are called to create a connect doesn't matter.

Parameters:

`outputNumber` - the output number on this component
`sink` - the sink component
`sinkPin` - the input pin number on the sink component
`wireId` - the id number of the `wire`representing this connection

disconnectFromOutput

```
public void disconnectFromOutput(int outputNumber,
          LogicComponent sink,
          int sinkPin)
```

Breaks the connection from a given output pin on this component to another `LogicComponent`. The `disconnectFromInput`method of the sink component must also be called to break the other end of the connection.

Parameters:

`outputNumber` - the output pin number to disconnect
`sink` - the sink `LogicComponent`being disconnected from
`sinkPin` - the input pin number on the sink `LogicComponent`

getConnectionPointIn

```
protected LogicComponent.ConnectionPoint getConnectionPointIn(int inputNumber)
```

Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired input pin.

Parameters:

`inputNumber` - the input pin number to connect to

Returns:

the `ConnectionPoint`

getConnectionPointOut

```
protected LogicComponent.ConnectionPoint getConnectionPointOut(int outputNumber)
```

Returns a `ConnectionPoint`object containing the information necessary to make a connection to the desired output pin.

Parameters:

`outputNumber` - the output pin number to connect to

Returns:

the `ConnectionPoint`

update

```
public void update(Observable observerable,
          Object o)
```

Called when a `LogicComponent`that this component was observing has updated its output values.

Parameters:

`observerable` - the source component `LogicComponent`
`o` - unused; should be `null`

setState

```
public void setState(byte s)
```

Sets the state of the component. The state is used to re-compute all the outputs and notify its observers. Each subclass that needs this method must implement it according to the states it has. Call this method to initialize the component if its an input component, or change its state if the user interacts with its component image during simulation.

Parameters:

`s` - the state number

(continued from last page)

getValueOfInput

`protected byte` **`getValueOfInput`**`(int inputNumber)`

Returns the value of a given input by checked the connected source component's output pin. If no component is connected to the input pin, `UNDEFINED`is returned.

Parameters:

`inputNumber -` the input number

Returns:

the value of the input

---

getValueOfOutput

`public byte` **`getValueOfOutput`**`(int outputNumber)`

Returns the computed value of an output, given an output pin number.

Parameters:

`outputNumber -` the output pin number

Returns:

the value on the output pin

---

setValueOfOutput

```
public void setValueOfOutput(int outputNumber,
         byte value)
```

Sets the value of a given output pin and notifies all observing `LogicComponents`. The value may be `TRUE`, `FALSE`or `UNDEFINED`.

Parameters:

`outputNumber -` the output pin number
`value -` the new value

---

resetState

`public void` **`resetState`**`()`

Sets the values of all the output pins to `UNDEFINED`. Call this method to reset the state of each component after running the simulation.

---

getInputConnections

`public LogicComponent.ConnectionPoint[]` **`getInputConnections`**`()`

Returns an array of the component's input `ConnectionPoints`.

Returns:

the input connections

---

isInputAvailable

`public boolean` **`isInputAvailable`**`(int pinNumber)`

Returns `true`if the specified input pin has not connected to anything.

Parameters:

`pinNumber -` the pin number

Returns:

(continued from last page)

`true`if the pin has no connections

isASink

`public boolean` **`isASink`**`(LogicComponent lc)`

Returns `true`if a given `LogicComponent`is attached to an output on this component.

Parameters:

`lc` - the possible sink component

Returns:

`true`if `lc`is connected, otherwise `false`

getWires

`public HashSet` **`getWires`**`()`

Returns a collection of all the IDs of the wires attached to the componenent. // TODO return a set of Wires instead

Returns:

the collection of IDs as `Integers`

getClone

`public LogicComponent` **`getClone`**`()`

Returns a copy of this logic component. If it has a corresponding component image, it will be stripped from the copy.

Returns:

a copy of the logic component

compute

`protected abstract void` **`compute`**`()`

This method is called when the `LogicComponent`is notified that one of its input values has changed. Implement this method to compute the new `outputValues`.

getTypeString

`public abstract String` **`getTypeString`**`()`

Returns a string that uniquely identifies each type of `LogicComponent`.

Returns:

the identifying string

getFunction

`public int` **`getFunction`**`()`

Returns the function of the component in a circuit. It may be an input component (with no outputs), an output component (with no inputs), or a logic component. The three values returned respectively are `INPUT`, `OUTPUT`, and `LOGIC`.

Returns:

the component's function in a circuit

model
Class LogicComponent.ConnectionPoint

```
java.lang.Object
   |
   +-model.LogicComponent.ConnectionPoint
```

protected class **LogicComponent.ConnectionPoint**
extends Object

A `ConnectionPoint`object encapsulates all the information necessary to represent the endpoint of a connection made to a `LogicComponent`: the component, the pin number on the component and the id number of the wire attached to the pin on the component, if it exists (otherwise `null`).

Field Summary

`LogicComponent`	`component` the `LogicComponent`that this is for
`int`	`pinNumber` the pin number (input or output) on `component`
`int`	`wireId` id number of the `wire`attached to `pinNumber`on `component`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Fields

wireId

`public int` **`wireId`**

id number of the `wire`attached to `pinNumber`on `component`

pinNumber

`public int` **`pinNumber`**

the pin number (input or output) on `component`

component

`public model.LogicComponent` **`component`**

the `LogicComponent`that this is for

model
Class LogicComponentFactory

```
java.lang.Object
   |
   +-model.LogicComponentFactory
```

public class **LogicComponentFactory**
extends Object

Provides functionality for creating `LogicComponent`objects from a given type string.

Method Summary

LogicComponent	`buildComponent(String type)` Creates and returns a component of the type specified by a `TYPE_STRING`.
LogicComponent	`buildComponent(String type,int x,int y)` Creates and returns a component of the type specified by a `TYPE_STRING`.
static LogicComponentFactory	`getDefaultInstance()` Returns the default factory for building logic components.
static LogicComponentFactory	`newInstance()` Returns a new factory for building logic components with the defaults for model and gui preset.
static void	`setDefaultGui(Gui gui)` Sets the gui for the default factory.
static void	`setDefaultModel(Model model)` Sets the model for the default factory.
void	`setGui(Gui gui)` Sets the factory's gui reference.
void	`setModel(Model model)` Sets the factory's model reference.

Methods inherited from class `java.lang.Object`

`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Methods

setGui

`public void` **`setGui`**`(Gui gui)`

(continued from last page)

Sets the factory's gui reference.

Parameters:
`gui` - the gui

---

setModel

```
public void setModel(Model model)
```

Sets the factory's model reference.

Parameters:
`model` - the model

---

buildComponent

```
public LogicComponent buildComponent(String type,
                                     int x,
                                     int y)
  throws Exception
```

Creates and returns a component of the type specified by a `TYPE_STRING`. The location must be in standard coordinates.

Parameters:
`type` - the component type
`x` - the x coordinate
`y` - the y coordinate

---

buildComponent

```
public LogicComponent buildComponent(String type)
  throws Exception
```

Creates and returns a component of the type specified by a `TYPE_STRING`.

Parameters:
`type` - the component type

---

setDefaultGui

```
public static void setDefaultGui(Gui gui)
```

Sets the gui for the default factory. As a side effect, the default factory must be reinstantiated.

Parameters:
`gui` - the gui

---

setDefaultModel

```
public static void setDefaultModel(Model model)
```

Sets the model for the default factory. As a side effect, the default factory must be reinstantiated.

Parameters:
`model` - the model

---

getDefaultInstance

```
public static LogicComponentFactory getDefaultInstance()
```

Returns the default factory for building logic components.

Returns:

(continued from last page)

the factory

newInstance

`public static LogicComponentFactory newInstance()`

Returns a new factory for building logic components with the defaults for model and gui preset.

Returns:

the new factory

model
Class Model

```
java.lang.Object
   |
   +-model.Model
```

All Implemented Interfaces:
Runnable

---

public class **Model**
extends Object
implements Runnable

A `Model` is the logical representation of a collection of circuits. A model is composed of `LogicComponents` and `Wires`.

`LogicComponent` objects are connected to each other in the `model` with `wires` as `Observers` and `Observables` to pass signals while the logic simulation is being run.

`Model` objects can save and load their internal circuit configuration in XML format for persistent data storage.

Constructor Summary

public	`Model(Controller controller)` Constructs a new empty `Model` object.
public	`Model(Controller controller,java.io.File modelFile)` Constructs a new `Model` object, loading the model data from a file.

Method Summary

int	`addComponent(int id,LogicComponent lc)` Adds a `LogicComponent` object to the `model`, given an existing unique id number.
int	`addComponent(LogicComponent lc)` Adds a `LogicComponent` object to the `model` and assigns it a new unique id number.
void	`addStateChange(LogicComponent logicComponent,int outputNumber,byte newValue)` Creates a new `StateChange` and adds it to the state change queue.
void	`addWire(int id,Wire w)` Adds a `Wire` object to the `model`, given an existing unique id number.
boolean	`canBeAComponent()` Checks if the model can be saved as a custom component.
void	`connectComponents(Wire wire)` Makes a visual connection between two components using a `Wire` object.

void	`disconnectComponents(Wire wire)` Disconnects a visual connection between two components.
LogicComponent	`getComponent(int id)` Returns a `LogicComponent`object by id number.
Iterator	`getComponents()` Returns an iterator for the collection of logic components in the model.
HashSet	`getInputComponents()` Returns the input components in the model.
HashSet	`getOutputComponents()` Returns the output components in the model.
long	`getSimDelay()` Returns the propagation delay between components during the simulation execution.
Wire	`getWire(int id)` Returns a `Wire`object by id number.
Iterator	`getWires()` Returns an iterator for the collection of wires in the model.
void	`removeComponent(int id)` Removes a `LogicComponent`object from the model.
void	`removeWire(int id)` Removes a `Wire`object from the model.
void	`run()` Executes the logic simulation.
void	`setSimDelay(long delay)` Sets the propagation delay between components during the simulation execution.
void	`startSimulation()` Starts the logic simulation.
void	`stopSimulation()` Stops the logic simulation.
void	`writeToXML(java.io.File file)` Writes the `model's`data to a file in XML format.

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

(continued from last page)

Model

```
public Model(Controller controller)
```

Constructs a new empty `Model` object.

Parameters:

`controller` - the model's `Controller`

Model

```
public Model(Controller controller,
             java.io.File modelFile)
```

Constructs a new `Model` object, loading the model data from a file.

Parameters:

`modelFile` - the file to load
`controller` - the model's `Controller`

Throws:

`Exception` - if the model file could not be loaded

Methods

startSimulation

```
public void startSimulation()
```

Starts the logic simulation. To set up the simulation, the thread must be started, and all the input components notified so they will send out their initial signals.

---

stopSimulation

```
public void stopSimulation()
```

Stops the logic simulation. To stop the simulation, the thread must be stopped and all output values of all components must be reset to `UNDEFINED`.

---

run

```
public void run()
```

Executes the logic simulation. This is called by the `Thread` created in the `startSimulation` method. It will return when the instance variable `stopSimulation` is `true`.

---

addStateChange

```
public void addStateChange(LogicComponent logicComponent,
          int outputNumber,
          byte newValue)
```

Creates a new `StateChange` and adds it to the state change queue. The time stamp is set by adding `simDelay` to the current time.

Parameters:

`logicComponent` - the target logic component
`outputNumber` - the output number on the component
`newValue` - the value to set the output to

(continued from last page)

setSimDelay

`public void` **`setSimDelay`**`(long delay)`

Sets the propagation delay between components during the simulation execution. Do not set this value too long or large models will not have enough time to update.

Parameters:

`delay -` the delay in milliseconds

---

getSimDelay

`public long` **`getSimDelay`**`()`

Returns the propagation delay between components during the simulation execution.

Returns:

the delay in milliseconds

---

canBeAComponent

`public boolean` **`canBeAComponent`**`()`
`throws Exception`

Checks if the model can be saved as a custom component. To be a custom component, a model must have at least one input and one output.

Returns:

`true`if the model can be a custom component

---

getInputComponents

`public HashSet` **`getInputComponents`**`()`

Returns the input components in the model. This is used for creating a new custom component.

Returns:

a set of logic components

---

getOutputComponents

`public HashSet` **`getOutputComponents`**`()`

Returns the output components in the model. This is used for creating a new custom component.

Returns:

a set of logic components

---

writeToXML

`public void` **`writeToXML`**`(java.io.File file)`
`throws Exception`

Writes the `model's`data to a file in XML format. If the file already exists, it will be overwritten.

Parameters:

`file -` the file to write

Throws:

`Exception -` if the file could not be written

(continued from last page)

addComponent

`public int` **`addComponent`**`(LogicComponent lc)`

Adds a `LogicComponent`object to the `model`and assigns it a new unique id number.

Parameters:

`lc` - the component to add

Returns:

the new id number assigned to the component

---

addComponent

`public int` **`addComponent`**`(int id, LogicComponent lc)`

Adds a `LogicComponent`object to the `model`, given an existing unique id number.

Parameters:

`id` - the id number of the component
`lc` - the component to add

Returns:

the id number of the component

---

addWire

`public void` **`addWire`**`(int id, Wire w)`

Adds a `Wire`object to the `model`, given an existing unique id number.

Parameters:

`id` - the id number of the wire
`w` - the wire to add

---

getComponent

`public` `LogicComponent` **`getComponent`**`(int id)`

Returns a `LogicComponent`object by id number. If the component does not exist in the model, `null`is returned.

Parameters:

`id` - the id number of the component

Returns:

the component if it is found, otherwise `null`.

---

getComponents

`public Iterator` **`getComponents`**`()`

Returns an iterator for the collection of logic components in the model.

Returns:

the iterator

---

removeComponent

`public void` **`removeComponent`**`(int id)`

(continued from last page)

Removes a `LogicComponent`object from the model.

Parameters:

`id` - the id number of the component

removeWire

`public void` **`removeWire`**`(int id)`

Removes a `Wire`object from the model.

Parameters:

`id` - the id number of the wire

getWire

`public` `Wire` **`getWire`**`(int id)`

Returns a `Wire`object by id number. if the `wire`does not exist in the model, `null`is returned.

Parameters:

`id` - the id number of the `wire`

Returns:

the `wire`if it is found, otherwise `null`

getWires

`public Iterator` **`getWires`**`()`

Returns an iterator for the collection of wires in the model.

Returns:

the iterator

connectComponents

`public void` **`connectComponents`**`(`Wire` wire)`

Makes a visual connection between two components using a `Wire`object. The logical connection is also made.

Parameters:

`wire` - the wire that makes the connection

disconnectComponents

`public void` **`disconnectComponents`**`(`Wire` wire)`

Disconnects a visual connection between two components. The logical connection is broken and the wire is removed from the model.

Parameters:

`wire` - the wire making the connection

model
Class Nand2Gate

```
java.lang.Object
   |
   +-java.util.Observable
      |
      +-model.LogicComponent
         |
         +-model.Nand2Gate
```

public class **Nand2Gate**
extends LogicComponent

`Nand2Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a two-input NAND gate.

See Also:
Nand3Gate, Nand4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **nand2**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nand2Gate(Model model)` Constructs a solitary new `Nand2Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

```
public static final java.lang.String TYPE_STRING
```

used to identify And2Gateobjects

Constructors

Nand2Gate

```
public Nand2Gate(Model model)
```

Constructs a solitary new Nand2Gateobject.

Parameters:

`model` - the model

Methods

compute

```
protected void compute()
```

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

getTypeString

```
public String getTypeString()
```

Returns the identifying string for this type of LogicComponentobject. All Nand2Gateobjects return Nand2Gate.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class Nand3Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Nand3Gate
```

public class **Nand3Gate**
extends LogicComponent

`Nand3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a three-input NAND gate.

See Also:
Nand2Gate, Nand4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **nand3**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nand3Gate(Model model)` Constructs a solitary new `Nand3Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Nand3Gate

`public Nand3Gate(Model model)`

Constructs a solitary new `Nand3Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Nand3Gate`objects return `Nand3Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Nand4Gate

```
java.lang.Object
   |
   +-java.util.Observable
      |
      +-model.LogicComponent
         |
         +-model.Nand4Gate
```

public class **Nand4Gate**
extends LogicComponent

`Nand3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a four-input NAND gate.

See Also:
Nand2Gate, Nand3Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **nand4**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nand4Gate(Model model)` Constructs a solitary new `Nand4Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

```
public static final java.lang.String TYPE_STRING
```

used to identify And2Gateobjects

Constructors

Nand4Gate

```
public Nand4Gate(Model model)
```

Constructs a solitary new Nand4Gateobject.

Parameters:

`model` - the model

Methods

compute

```
protected void compute()
```

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

getTypeString

```
public String getTypeString()
```

Returns the identifying string for this type of LogicComponentobject. All Nand4Gateobjects return Nand4Gate.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class Nor2Gate

```
java.lang.Object
   |
   +-java.util.Observable
      |
      +-model.LogicComponent
         |
         +-model.Nor2Gate
```

public class **Nor2Gate**
extends LogicComponent

`Nor2Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a two-input NAND gate.

See Also:
Nand3Gate, Nand4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`nor2`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nor2Gate(Model model)` Constructs a solitary new `Nor2Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Nor2Gate

`public Nor2Gate(Model model)`

Constructs a solitary new `Nor2Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Nor2Gate`objects return `Nor2Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Nor3Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Nor3Gate
```

public class **Nor3Gate**
extends LogicComponent

`Nor3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a three-input NAND gate.

See Also:
Nand2Gate, Nand4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`nor3`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nor3Gate(Model model)` Constructs a solitary new `Nor3Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Nor3Gate

`public Nor3Gate(Model model)`

Constructs a solitary new `Nor3Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Nor3Gate`objects return `Nor3Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Nor4Gate

```
java.lang.Object
   ┣-java.util.Observable
      ┣-model.LogicComponent
         ┣-model.Nor4Gate
```

public class **Nor4Gate**
extends LogicComponent

`Nand3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a four-input NAND gate.

See Also:
Nand2Gate, Nand3Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`nor4`**

Fields inherited from class `model.LogicComponent`
`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Nor4Gate(Model model)` Constructs a solitary new `Nor4Gate`object.

Method Summary

`void`	`compute()` Computes the output of the NAND gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`
`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Nor4Gate

`public Nor4Gate(Model model)`

Constructs a solitary new `Nor4Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the NAND gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Nor4Gate`objects return `Nor4Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class NotGate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.NotGate
```

public class **NotGate**
extends LogicComponent

`NotGate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a NOT gate.

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`not`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`NotGate(Model model)` Constructs a solitary new `NotGate`object.

Method Summary

`void`	`compute()` Computes the output of the NOT gate based on the input.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class `java.util.Observable`

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify And2Gateobjects

Constructors

NotGate

public **NotGate**(Model model)

Constructs a solitary new NotGateobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Computes the output of the NOT gate based on the input. If the calculated value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

getTypeString

public String **getTypeString**()

Returns the identifying string for this type of LogicComponentobject. All NotGateobjects return NotGate.TYPE_STRING.

Returns:

the object's type-identifying string

model
Class Or2Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Or2Gate
```

public class **Or2Gate**
extends LogicComponent

`Or2Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a two-input OR gate.

See Also:
Or3Gate, Or4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `Or2Gate`objects Value: **`or2`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Or2Gate(Model model)` Constructs a solitary new `Or2Gate`object.

Method Summary

`void`	`compute()` Computes the output of the OR gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String` **`TYPE_STRING`**

used to identify `Or2Gate`objects

Constructors

Or2Gate

`public` **`Or2Gate`**`(Model model)`

Constructs a solitary new `Or2Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void` **`compute`**`()`

Computes the output of the OR gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`object. All `Or2Gate`objects return `Or2Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Or3Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Or3Gate
```

public class **Or3Gate**
extends LogicComponent

`Or3Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a three-input OR gate.

See Also:
Or2Gate, Or4Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`or3`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Or3Gate(Model model)` Constructs a solitary new `Or3Gate`object.

Method Summary

`void`	`compute()` Computes the output of the OR gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Or3Gate

`public Or3Gate(Model model)`

Constructs a solitary new `Or3Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the OR gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Or3Gate`objects return `Or3Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Or4Gate

```
java.lang.Object
   ┣-java.util.Observable
      ┣-model.LogicComponent
         ┣-model.Or4Gate
```

public class **Or4Gate**
extends LogicComponent

`Or4Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a four-input OR gate.

See Also:
Or2Gate, Or3Gate

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`or4`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Or4Gate(Model model)` Constructs a solitary new `Or4Gate`object.

Method Summary

`void`	`compute()` Computes the output of the OR gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class java.util.Observable
addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String TYPE_STRING`

used to identify `And2Gate`objects

Constructors

Or4Gate

`public Or4Gate(Model model)`

Constructs a solitary new `Or4Gate`object.

Parameters:

`model` - the model

Methods

compute

`protected void compute()`

Computes the output of the OR gate based on the inputs. If the calculated value differs from the current output value, a `State`object is created and put on the `model`'squeue to change the output value later.

getTypeString

`public String getTypeString()`

Returns the identifying string for this type of `LogicComponent`object. All `Or4Gate`objects return `Or4Gate.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class StateChange

```
java.lang.Object
   |
   +-model.StateChange
```

All Implemented Interfaces:
Comparable

---

public class **StateChange**
extends Object
implements Comparable

Encapsulates the information necessary to change the output value of a component. `StateChange`objects are created by logic components when an output value needs to changed.

All `StateChange`objects are placed in a `TreeSet`collection and sorted by a timestamp (secondarily by id). When the system clock reaches the time stamp of a `StateChange`object, the change is then applied to the associated component's output.

Constructor Summary

public	`StateChange(LogicComponent logicComponent,int outputNumber,byte newValue,long timeStamp)` Constructs a new instance of `StateChange`which should be executed at the specified time.

Method Summary

int	`compareTo(Object o)` Compares the timestamp of this `StateChange`to another's.
void	`execute()` Sets the new value of the target output on a logic component.
long	`getTimeStamp()` Returns the time when this `StateChange`should be executed in milliseconds.

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

(continued from last page)

StateChange

```
public StateChange(LogicComponent logicComponent,
                   int outputNumber,
                   byte newValue,
                   long timeStamp)
```

Constructs a new instance of `StateChange`which should be executed at the specified time.

Parameters:

`logicComponent` - the logic component to change
`outputNumber` - the output number of the logic component
`newValue` - the value to give the output
`timeStamp` - the time (in millis) when the change shold be made

Methods

execute

```
public void execute()
```

Sets the new value of the target output on a logic component.

---

getTimeStamp

```
public long getTimeStamp()
```

Returns the time when this `StateChange`should be executed in milliseconds.

Returns:

the time stamp

---

compareTo

```
public int compareTo(Object o)
```

Compares the timestamp of this `StateChange`to another's. If the timestamps are equal, the id numbers are compared. The object with the lower id number is ordered first.

Returns:

a negative integer, zero, or a positive integer as this object is less than, equal to, or greater than the specified object

model
Class Switch

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Switch
```

public class **Switch**
extends LogicComponent

`Switch`extends the abstract class `LogicComponent`, implementing the logic required to simulate a toggle switch.

Field Summary

`static final String`	`TYPE_STRING` used to identify `Button`objects Value: **`switch`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Switch(Model model)` Constructs a solitary new `Switch`object.

Method Summary

`void`	`compute()` Computes the output of the switch based on the state of its corresponding gui object, `SwitchImage`.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`setState(byte s)` Turns the switch off or on.

Methods inherited from class `model.LogicComponent`

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class java.util.Observable

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify Buttonobjects

Constructors

Switch

public **Switch**(Model model)

Constructs a solitary new Switchobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Computes the output of the switch based on the state of its corresponding gui object, SwitchImage. If the value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

setState

public void **setState**(byte s)

Turns the switch off or on. Possible states are: 0- Off1- On

Parameters:

s - the state

(continued from last page)

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`object. All `Switch`objects return `Switch.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Vcc

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Vcc
```

public class **Vcc**
extends LogicComponent

Vccextends the abstract class `LogicComponent`, implementing the logic required to simulate a grounded terminal.

Field Summary

`static final String`	`TYPE_STRING` used to identify `Button`objects Value: **`vcc`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Vcc(Model model)` Constructs a solitary new `Vcc`object.

Method Summary

`void`	`compute()` If the output value isn't `FALSE`yet, a `State`object is created and put on the `model`'s queue to change the output value to `FALSE`later.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.
`void`	`setState(byte s)` Sends the initial signal from the grounded terminal.

Methods inherited from class `model.LogicComponent`

compute, connectToInput, connectToInput, connectToOutput, connectToOutput, disconnectFromInput, disconnectFromOutput, getClone, getComponentImage, getConnectionPointIn, getConnectionPointOut, getFunction, getId, getInputConnections, getNumberOfInputs, getNumberOfOutputs, getTypeString, getValueOfInput, getValueOfOutput, getWires, isASink, isInputAvailable, resetState, setComponentImage, setId, setState, setValueOfOutput, update

Methods inherited from class `java.util.Observable`

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class `java.lang.Object`

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

`public static final java.lang.String` **`TYPE_STRING`**

used to identify `Button`objects

Constructors

Vcc

`public` **`Vcc`**`(Model model)`

Constructs a solitary new `Vcc`object.

Parameters:

`model` - the model

Methods

compute

`protected void` **`compute`**`()`

If the output value isn't `FALSE`yet, a `State`object is created and put on the `model`'s queue to change the output value to `FALSE`later.

setState

`public void` **`setState`**`(byte s)`

Sends the initial signal from the grounded terminal. The state is not applicable to this type of input component.

Parameters:

`s` - *unused*

(continued from last page)

getTypeString

`public String` **`getTypeString`**`()`

Returns the identifying string for this type of `LogicComponent`object. All `Vcc`objects return `Switch.TYPE_STRING`.

Returns:

the object's type-identifying string

model
Class Wire

```
java.lang.Object
   |
   +-model.Wire
```

public class **Wire**
extends Object

A `Wire`object represents the logical aspect of a wire in the model. It contains references to its end points and has a corresponding `WireImage`gui object.

`Wires`don't implement any logical functionality in terms of simulating circuits. They are only for representing the connection between two components in a way that can be loaded from disk and stored again.

See Also:
LogicComponent

Constructor Summary

public	`Wire(LogicComponent source,int sourcePin,LogicComponent sink,int sinkPin)` Constructs a new `Wire`object, given its end points.

Method Summary

int	`getId()` Returns the id number of the `wire`.
LogicComponent	`getSink()` Returns the sink component attached to this `Wire`.
int	`getSinkPin()` Returns the input pin number on the sink component.
LogicComponent	`getSource()` Returns the source component attached to this `Wire`.
int	`getSourcePin()` Returns the output pin number on the source component.
WireImage	`getWireImage()` Returns the corresponding GUI wire.
void	`setId(int id)` Sets the id number of the `wire`.
void	`setSink(LogicComponent sink,int sinkPin)` Sets the sink component and input pin on the sink.

void	`setSource(LogicComponent source,int sourcePin)` Sets the source component and output pin on the source.
void	`setWireImage(WireImage wireImage)` Sets the corresponding `wireImage`object in the GUI.

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

Wire

```
public Wire(LogicComponent source,
            int sourcePin,
            LogicComponent sink,
            int sinkPin)
```

Constructs a new `Wire`object, given its end points.

Parameters:

`source` - the source `LogicComponent`
`sourcePin` - the output pin number on the `source`
`sink` - the sink `LogicComponent`
`sinkPin` - the output pin number on the `sink`

Methods

setId

```
public void setId(int id)
```

Sets the id number of the `wire`.

Parameters:

`id` - the id number

getId

```
public int getId()
```

Returns the id number of the `wire`.

Returns:

the id number

getWireImage

```
public WireImage getWireImage()
```

Returns the corresponding GUI wire.

Returns:

the `wireImage`object

setWireImage

`public void setWireImage(WireImage wireImage)`

Sets the corresponding `wireImage`object in the GUI. If the `wireImage`isn't already associated with this `wire`, it will be associatesd with this.

Parameters:

`wireImage` - the wireImage to set

getSource

`public LogicComponent getSource()`

Returns the source component attached to this `Wire`. If none is currently attached, `null`is returned.

Returns:

the source component

getSink

`public LogicComponent getSink()`

Returns the sink component attached to this `Wire`. If none is currently attached, `null`is returned.

Returns:

the sink component

getSourcePin

`public int getSourcePin()`

Returns the output pin number on the source component. If none is currently attached, -1 is returned.

Returns:

the source output pin number

getSinkPin

`public int getSinkPin()`

Returns the input pin number on the sink component. If none is currently attached, -1 is returned.

Returns:

the sink input pin number

setSource

```
public void setSource(LogicComponent source,
          int sourcePin)
```

Sets the source component and output pin on the source.

Parameters:

`source` - the source logic component
`sourcePin` - the output pin on the source component

setSink

```
public void setSink(LogicComponent sink,
          int sinkPin)
```

(continued from last page)

Sets the sink component and input pin on the sink.

Parameters:

`sink` - the sink logic component

`sinkPin` - the input pin on the sink component

model
Class WireFactory

```
java.lang.Object
   |
   +-model.WireFactory
```

public class **WireFactory**
extends Object

Provides functionality for creating `Wire`objects.

Constructor Summary

public	`WireFactory()` Constructs a new `WireFactory`object.

Method Summary

`Wire`	`buildWire(LogicComponent source,int sourcePin,LogicComponent sink,int sinkPin)` Creates and returns a wire with the given parameters.
static `WireFactory`	`getDefaultFactory()` Returns the default factory for building wires.
void	`setGui(Gui gui)` Sets the gui for this factory.

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

WireFactory

`public` **`WireFactory`**`()`

Constructs a new `WireFactory`object. Use `WireFactory.getDefaultFactory()`to get a factory instance instead of creating a new one.

Methods

setGui

`public void` **`setGui`**`(Gui gui)`

Sets the gui for this factory. The gui is used for instantiating wire images corresponding to logical wire objects.

(continued from last page)

Parameters:

`gui` - the gui

---

buildWire

```
public Wire buildWire(LogicComponent source,
                      int sourcePin,
                      LogicComponent sink,
                      int sinkPin)
```

Creates and returns a wire with the given parameters. The wire will have a corresponding GUI `WireImage`object.

Parameters:

`source` - the source component
`sourcePin` - the output pin on the source component
`sink` - the sink component
`sinkPin` - the input pin on the sink component

Returns:

the newly constructed wire

---

getDefaultFactory

```
public static WireFactory getDefaultFactory()
```

Returns the default factory for building wires.

Returns:

the factory

model
Class Xor2Gate

```
java.lang.Object
   ┗-java.util.Observable
      ┗-model.LogicComponent
         ┗-model.Xor2Gate
```

public class **Xor2Gate**
extends LogicComponent

`Xor2Gate`extends the abstract class `LogicComponent`, implementing the logic required to simulate a two-input XOR gate.

Field Summary

`static final String`	`TYPE_STRING` used to identify `And2Gate`objects Value: **`xor2`**

Fields inherited from class `model.LogicComponent`

`componentImage`, `FALSE`, `id`, `INPUT`, `inputs`, `LOGIC`, `model`, `newOutputValues`, `OUTPUT`, `outputs`, `outputValues`, `TRUE`, `UNDEFINED`

Constructor Summary

`public`	`Xor2Gate(Model model)` Constructs a solitary new `Xor2Gate`object.

Method Summary

`void`	`compute()` Computes the output of the XOR gate based on the inputs.
`String`	`getTypeString()` Returns the identifying string for this type of `LogicComponent`object.

Methods inherited from class `model.LogicComponent`

`compute`, `connectToInput`, `connectToInput`, `connectToOutput`, `connectToOutput`, `disconnectFromInput`, `disconnectFromOutput`, `getClone`, `getComponentImage`, `getConnectionPointIn`, `getConnectionPointOut`, `getFunction`, `getId`, `getInputConnections`, `getNumberOfInputs`, `getNumberOfOutputs`, `getTypeString`, `getValueOfInput`, `getValueOfOutput`, `getWires`, `isASink`, `isInputAvailable`, `resetState`, `setComponentImage`, `setId`, `setState`, `setValueOfOutput`, `update`

Methods inherited from class `java.util.Observable`

addObserver, clearChanged, countObservers, deleteObserver, deleteObservers, hasChanged, notifyObservers, notifyObservers, setChanged

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Fields

TYPE_STRING

public static final java.lang.String **TYPE_STRING**

used to identify And2Gateobjects

Constructors

Xor2Gate

public **Xor2Gate**(Model model)

Constructs a solitary new Xor2Gateobject.

Parameters:

model - the model

Methods

compute

protected void **compute**()

Computes the output of the XOR gate based on the inputs. If the calculated value differs from the current output value, a Stateobject is created and put on the model'squeue to change the output value later.

getTypeString

public String **getTypeString**()

Returns the identifying string for this type of LogicComponentobject. All Xor2Gateobjects return Xor2Gate.TYPE_STRING.

Returns:

the object's type-identifying string

Package
circuitsandbox

Contains miscellaneous utility classes.

circuitsandbox
Class ComponentFileFilter

```
java.lang.Object
   |
   +-javax.swing.filechooser.FileFilter
      |
      +-circuitsandbox.ComponentFileFilter
```

All Implemented Interfaces:
java.io.FileFilter

---

public class **ComponentFileFilter**
extends FileFilter
implements java.io.FileFilter

Filters out custom component files (*.csc). This filter works with the Swing file chooser and anything else that uses Java's basic `FileFilter`interface (`java.io.FileFilter`).

Constructor Summary

public	`ComponentFileFilter()`

Method Summary

boolean	`accept(java.io.File file)` Tests if file `f`will be accepted by this filter.
String	`getDescription()` Returns a short description of the file filter.

Methods inherited from class `javax.swing.filechooser.FileFilter`
`accept, getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

ComponentFileFilter

`public` **`ComponentFileFilter`**`()`

(continued from last page)

Methods

accept

`public boolean` **`accept`**`(java.io.File file)`

Tests if file `f`will be accepted by this filter.

Parameters:

`file -` the `File`to be tested

Returns:

`true`if the file is accepted by this filter, otherwise `false`

getDescription

`public String` **`getDescription`**`()`

Returns a short description of the file filter.

Returns:

the description

circuitsandbox
Class ImageFileFilter

```
java.lang.Object
   |
   +-javax.swing.filechooser.FileFilter
      |
      +-circuitsandbox.ImageFileFilter
```

All Implemented Interfaces:
java.io.FileFilter

---

public class **ImageFileFilter**
extends FileFilter
implements java.io.FileFilter

A FileFilter class for filtering out useful image files. This filter works with the Swing file chooser and anything else that uses Java's basic FileFilter interface (java.io.FileFilter).

Constructor Summary

public	`ImageFileFilter()`

Method Summary

boolean	`accept(java.io.File f)` Tests if file `f`will be accepted by this filter.
String	`getDescription()` Gets a short description of this file filter.

Methods inherited from class `javax.swing.filechooser.FileFilter`
`accept, getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

ImageFileFilter

`public` **`ImageFileFilter`**`()`

(continued from last page)

Methods

accept

`public boolean` **`accept`**`(java.io.File f)`

Tests if file `f`will be accepted by this filter.

Parameters:

`f -` the `File`to be tested

Returns:

`true`if the file is accepted by this filter, otherwise `false`.

---

getDescription

`public String` **`getDescription`**`()`

Gets a short description of this file filter.

Returns:

the description of this file filter class.

circuitsandbox
Class ModelFileFilter

```
java.lang.Object
   |
   +-javax.swing.filechooser.FileFilter
      |
      +-circuitsandbox.ModelFileFilter
```

All Implemented Interfaces:
java.io.FileFilter

---

public class **ModelFileFilter**
extends FileFilter
implements java.io.FileFilter

Filters out circuit model files (*.csm). This filter works with the Swing file chooser and anything else that uses Java's basic `FileFilter`interface (`java.io.FileFilter`).

Constructor Summary

public	`ModelFileFilter()`

Method Summary

boolean	`accept(java.io.File f)` Tests if file `f`will be accepted by this filter.
String	`getDescription()` Returns a short description of the file filter.

Methods inherited from class `javax.swing.filechooser.FileFilter`
`accept, getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

ModelFileFilter

`public` **`ModelFileFilter`**`()`

(continued from last page)

Methods

accept

`public boolean` **`accept`**`(java.io.File f)`

Tests if file `f`will be accepted by this filter.

Parameters:

`f -` the `File`to be tested

Returns:

`true`if the file is accepted by this filter, otherwise `false`

---

getDescription

`public String` **`getDescription`**`()`

Returns a short description of the file filter.

Returns:

the description

circuitsandbox
Class PNGFileFilter

```
java.lang.Object
   |
   +-javax.swing.filechooser.FileFilter
      |
      +-circuitsandbox.PNGFileFilter
```

All Implemented Interfaces:
java.io.FileFilter

---

public class **PNGFileFilter**
extends FileFilter
implements java.io.FileFilter

A FileFilter class for filtering out .PNG image files. This filter works with the Swing file chooser and anything else that uses Java's basic FileFilter interface (java.io.FileFilter).

Constructor Summary

public	`PNGFileFilter()`

Method Summary

boolean	`accept(java.io.File f)` Tests if file `f`will be accepted by this filter.
String	`getDescription()` Gets a short description of this file filter.

Methods inherited from class `javax.swing.filechooser.FileFilter`
`accept, getDescription`

Methods inherited from class `java.lang.Object`
`clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait`

Constructors

PNGFileFilter

```
public PNGFileFilter()
```

(continued from last page)

Methods

accept

`public boolean accept(java.io.File f)`

Tests if file `f`will be accepted by this filter.

Parameters:

`f -` the `File`to be tested

Returns:

`true`if the file is accepted by this filter, otherwise `false`.

---

getDescription

`public String getDescription()`

Gets a short description of this file filter.

Returns:

the description of this file filter class.

circuitsandbox
Class Util

```
java.lang.Object
   |
   +-circuitsandbox.Util
```

public class **Util**
extends Object

Contains a collection of stand-alone methods for performing miscellaneous tasks. The `Util`class never needs to be instantiated because all methods are class methods.

Constructor Summary

public	`Util()`

Method Summary

static org.w3c.dom.Node	`findFirstNode(org.w3c.dom.Node root,String name)` Finds the first `node`of a given name beneath a given root `node`.
static org.w3c.dom.Node	`findNextSameSibling(org.w3c.dom.Node node)` Finds the first sibling of a given `node`that matches its type and name.
static String	`getExtension(String path)` Returns a path's file extension.
static String	`getPathWithoutExtension(String path)` Removes the file extension from a file path.
static String	`getRelativePath(java.io.File file)` Returns the part of a given `file`'s path relative to the current working directory.
static boolean	`isLeftClick(MouseEvent evt)` Returns `true`if the left mouse button was involved in a mouse event.
static boolean	`isRightClick(MouseEvent evt)` Returns `true`if the right mouse button was involved in a mouse event.
static boolean	`isShiftClick(MouseEvent evt)` Returns `true`if the shift key was involved in a mouse event.
static java.io.File	`replaceExtension(java.io.File f,String ext)` Returns a file path with the file extension replaced.
static Point	`toStdCoords(Point p,float zoom)` Converts a point from screen coordinates to standard coordinates using the given zoom level.

static Rectangle	toStdCoords(Rectangle r,float zoom) Converts a rectangle from screen coordinates to standard coordinates using the given zoom level.

Methods inherited from class java.lang.Object
clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructors

Util

public **Util**()

Methods

findFirstNode

public static org.w3c.dom.Node **findFirstNode**(org.w3c.dom.Node root,
String name)

Finds the first nodeof a given name beneath a given root node. If no matching node is found, nullis returned.

Parameters:

root - the root nodeto search within
name - the name of the node

Returns:

the first matching node

findNextSameSibling

public static org.w3c.dom.Node **findNextSameSibling**(org.w3c.dom.Node node)

Finds the first sibling of a given nodethat matches its type and name. This is used instead of the getNextSiblingmethod because getNextSiblingoccasionally returns text nodes between nodesof the same type. If no matching nodeis found, nullis returned.

Parameters:

node - the nodeto begin searching from

Returns:

the first matching sibling, otherwise null

getPathWithoutExtension

public static String **getPathWithoutExtension**(String path)

Removes the file extension from a file path.

Parameters:

path - the file path

Returns:

(continued from last page)

a copy of `filepath`without an extension

---

getExtension

`public static String` **`getExtension`**`(String path)`

Returns a path's file extension. If no extension is found, an empty string is returned.

Parameters:

`path -` a file path

Returns:

the extension of file name

---

replaceExtension

`public static java.io.File` **`replaceExtension`**`(java.io.File f, String ext)`

Returns a file path with the file extension replaced. If no extension existed, one will be added.

Parameters:

`f -` the file

`ext -` the extension, without the dot

Returns:

a new path with the desired extension

---

getRelativePath

`public static String` **`getRelativePath`**`(java.io.File file)`

Returns the part of a given `file`'s path relative to the current working directory. If the `file`is not relative to the current working directory, `null`is returned.

Parameters:

`file -` the file

Returns:

the portion of the file's path relative to the current working directory

---

isRightClick

`public static boolean` **`isRightClick`**`(MouseEvent evt)`

Returns `true`if the right mouse button was involved in a mouse event. A return value of `true`would mean the right mouse button was clicked, held, or released during the event.

Parameters:

`evt -` the mouse event to check

Returns:

`true`if the event involves the right mouse button, otherwise `false`.

---

isLeftClick

`public static boolean` **`isLeftClick`**`(MouseEvent evt)`

Returns `true`if the left mouse button was involved in a mouse event. A return value of `true`would mean the left mouse button was clicked, held, or released during the event.

Parameters:

(continued from last page)

`evt` - the mouse event to check

Returns:

`true`if the event involves the left mouse button, otherwise `false`.

---

isShiftClick

```
public static boolean isShiftClick(MouseEvent evt)
```

Returns `true`if the shift key was involved in a mouse event. A return value of `true`would mean the shift key was held during the event.

Parameters:

`evt` - the mouse event to check

Returns:

`true`if the event involves the shift key

---

toStdCoords

```
public static Point toStdCoords(Point p,
          float zoom)
```

Converts a point from screen coordinates to standard coordinates using the given zoom level.

Parameters:

`p` - the point to convert
`zoom` - the magnification level

Returns:

the converted point

---

toStdCoords

```
public static Rectangle toStdCoords(Rectangle r,
          float zoom)
```

Converts a rectangle from screen coordinates to standard coordinates using the given zoom level.

Parameters:

`r` - the rectangle to convert
`zoom` - the magnification level

Returns:

the converted rectangle

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