Houston: We are in overload

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University of British Columbia

Note: This presentation involves many animations, videos , etc. Some of these are available on-line (avi files will attempt to play). Those that are not are indicated.

talk uses video clip unavailable on-line

unexpected
information overload

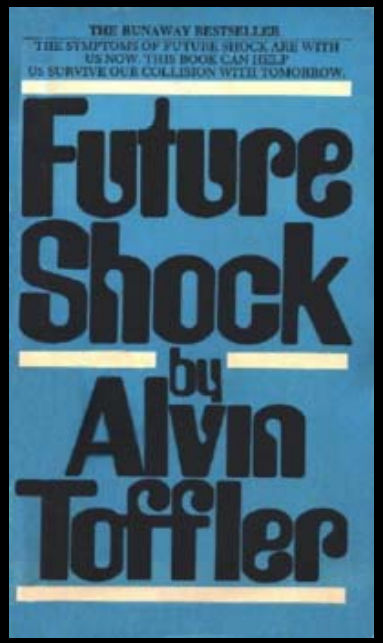
un·ex·pect·ed

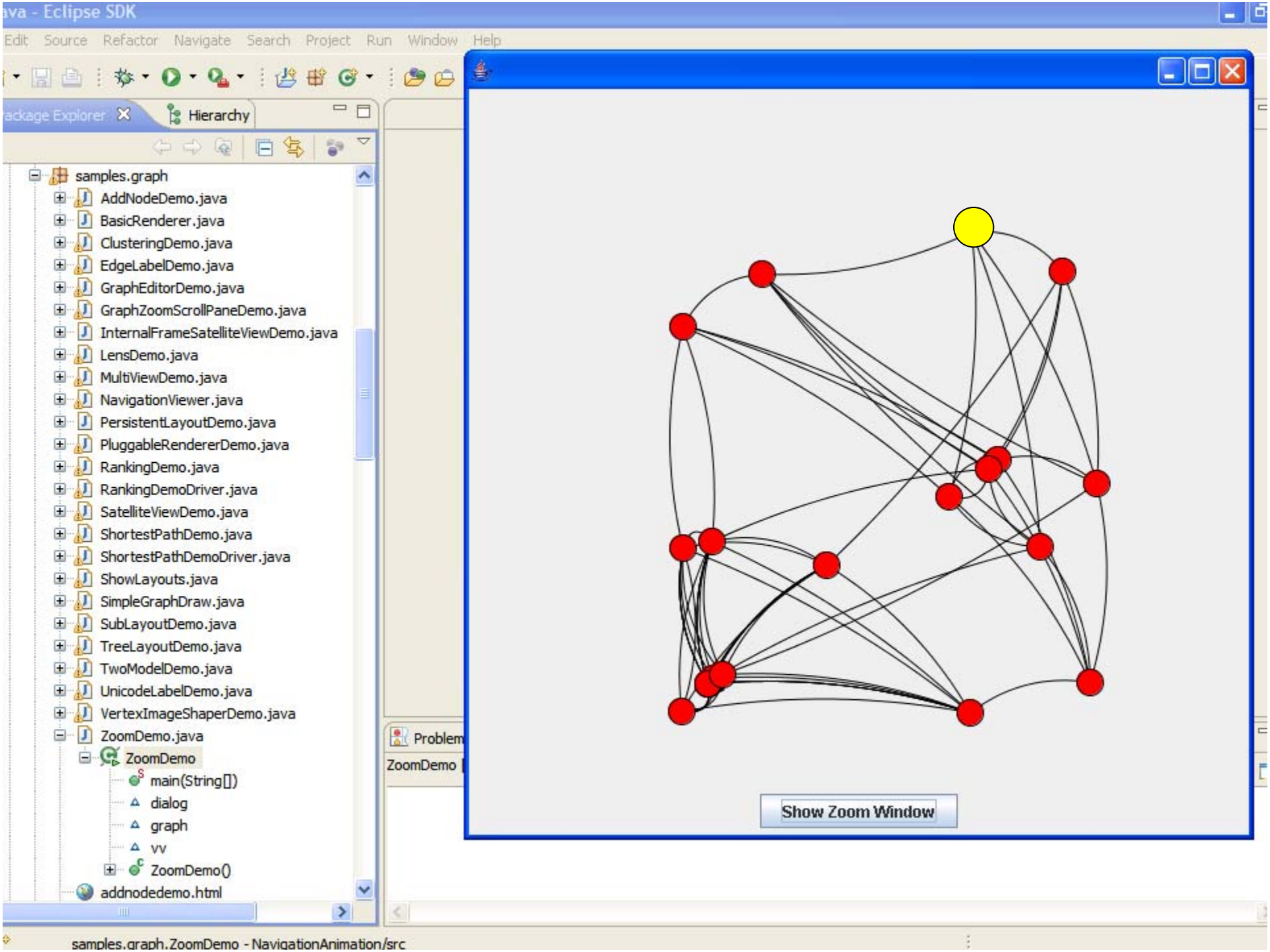
coming without warning; unforeseen

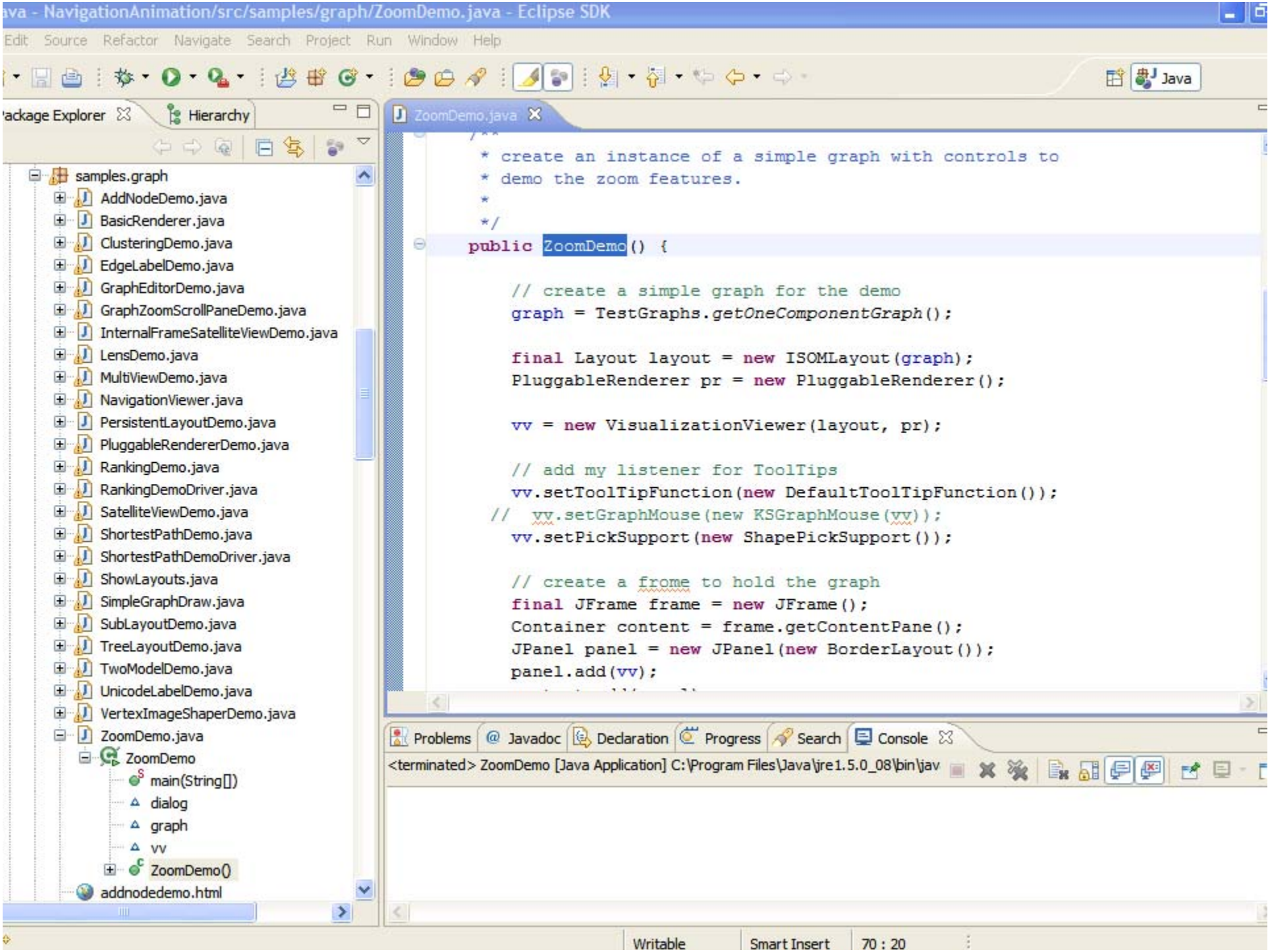
bugs, “found design”, missing documentation, regressions, …

information overload

too much information to make a decision




ava - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
ackage Explorer
Hierarchy
samples.graph
AddNodeDemo.java
BasicRenderer.java
ClusteringDemo.java
EdgeLabelDemo.java
GraphEditorDemo.java
GraphZoomScrollPaneDemo.java
InternalFrameSatelliteViewDemo.java
LensDemo.java
MultiViewDemo.java
NavigationViewer.java
PersistentLayoutDemo.java
PluggableRendererDemo.java
RankingDemo.java
RankingDemoDriver.java
SatelliteViewDemo.java
ShortestPathDemo.java
ShortestPathDemoDriver.java
ShowLayouts.java
SimpleGraphDraw.java
SubLayoutDemo.java
TreeLayoutDemo.java
TwoModelDemo.java
UnicodeLabelDemo.java
VertexImageShaperDemo.java
ZoomDemo.java
ZoomDemo
main(String[])
dialog
graph
vv
ZoomDemo()
addnodedemo.html
Problem
ZoomDemo
Show Zoom Window
samples.graph.ZoomDemo - NavigationAnimation/src


ava - NavigationAnimation/src/samples/graph/ZoomDemo.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
Package Explorer
Hierarchy
samples.graph
AddNodeDemo.java
BasicRenderer.java
ClusteringDemo.java
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GraphEditorDemo.java
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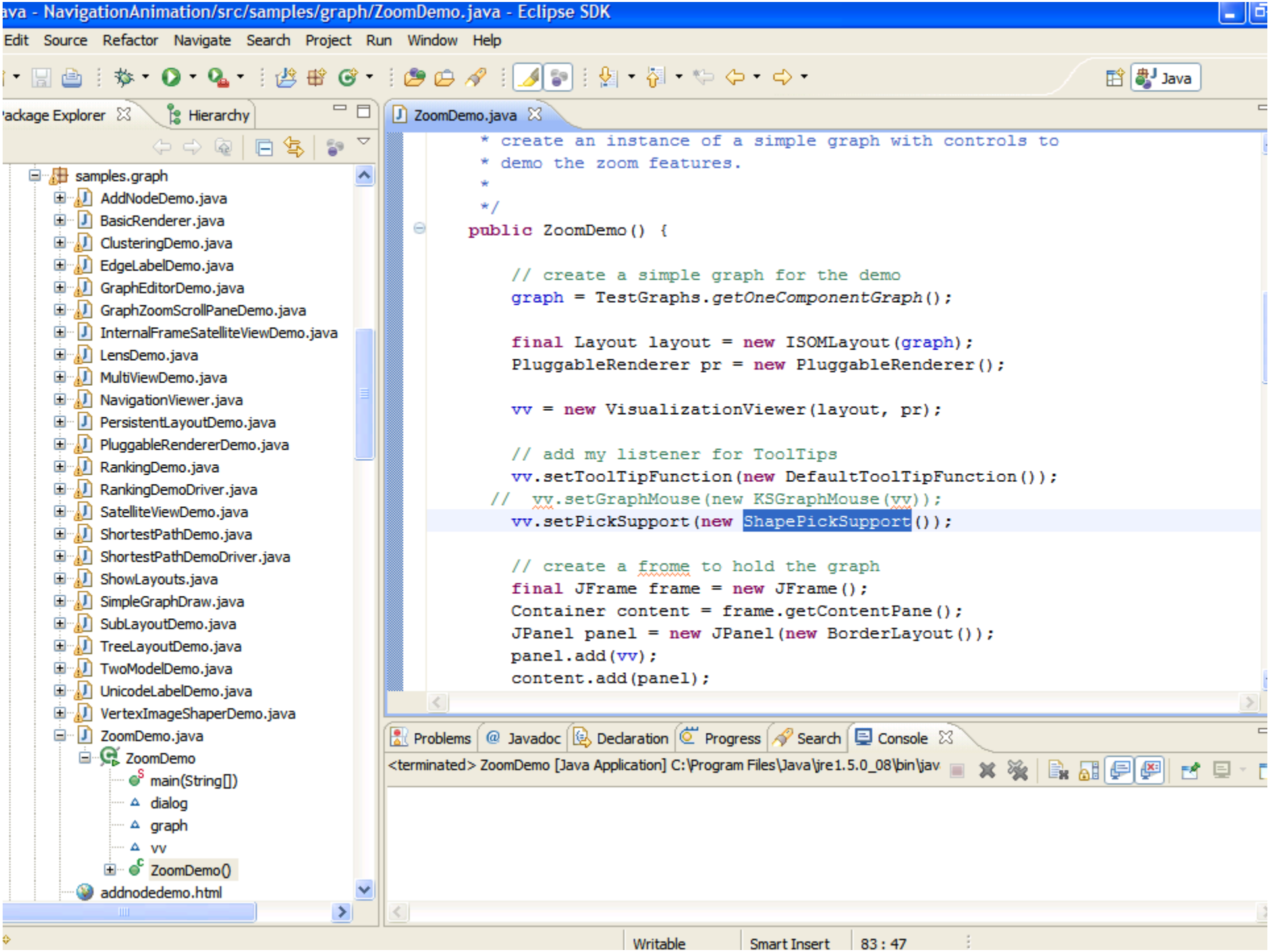
SubLayoutDemo.java
TreeLayoutDemo.java
TwoModelDemo.java
UnicodeLabelDemo.java
VertexImageShaperDemo.java
ZoomDemo.java
ZoomDemo
main(String[])
dialog
graph
vv
ZoomDemo()
addnodedemo.html
ZoomDemo.java
* create an instance of a simple graph with controls to
* demo the zoom features.
public ZoomDemo() {
// create a simple graph for the demo
graph = TestGraphs.getOneComponentGraph();
final Layout layout = new ISOMLayout(graph);
PluggableRenderer pr = new PluggableRenderer();
vv = new VisualizationViewer(layout, pr);
// add my listener for ToolTips
vv.setToolTipFunction(new DefaultToolTipFunction());
// vv.setGraphMouse(new KSGraphMouse(vv));
vv.setPickSupport(new ShapePickSupport());
// create a frome to hold the graph
final JFrame frame = new JFrame();
Container content = frame.getContentPane();
JPanel panel = new JPanel(new BorderLayout());
panel.add(vv);
Problems Javadoc Declaration Progress Search Console
<terminated> ZoomDemo [Java Application] C:\Program Files\Java\jre1.5.0_08\bin\jav
Writable
Smart Insert
70 : 20


ava - NavigationAnimation/src/samples/graph/ZoomDemo.java - Eclipse SDK
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Java
Package Explorer
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samples.graph
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NavigationViewer.java
PersistentLayoutDemo.java
PluggableRendererDemo.java
RankingDemo.java
RankingDemoDriver.java
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ShortestPathDemoDriver.java
ShowLayouts.java
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SubLayoutDemo.java
TreeLayoutDemo.java
TwoModelDemo.java
UnicodeLabelDemo.java
VertexImageShaperDemo.java
ZoomDemo.java
ZoomDemo
main(String[])
dialog
graph
vv
ZoomDemo()
addnodedemo.html
ZoomDemo.java
* create an instance of a simple graph with controls to
* demo the zoom features.
*
*/
public ZoomDemo() {
// create a simple graph for the demo
graph = TestGraphs.getOneComponentGraph();
final Layout layout = new ISOMLayout(graph);
PluggableRenderer pr = new PluggableRenderer();
vv = new VisualizationViewer(layout, pr);
// add my listener for ToolTips
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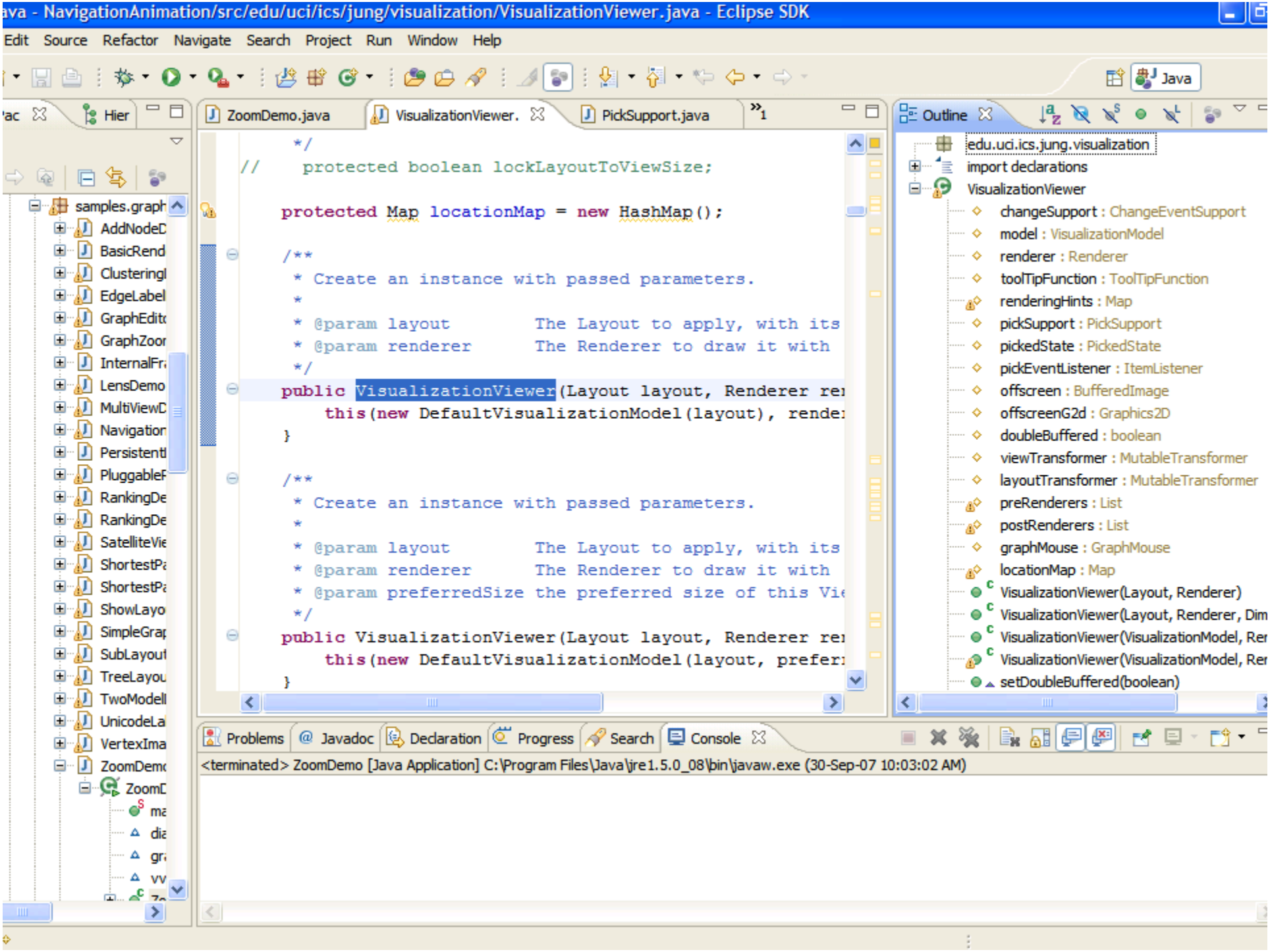
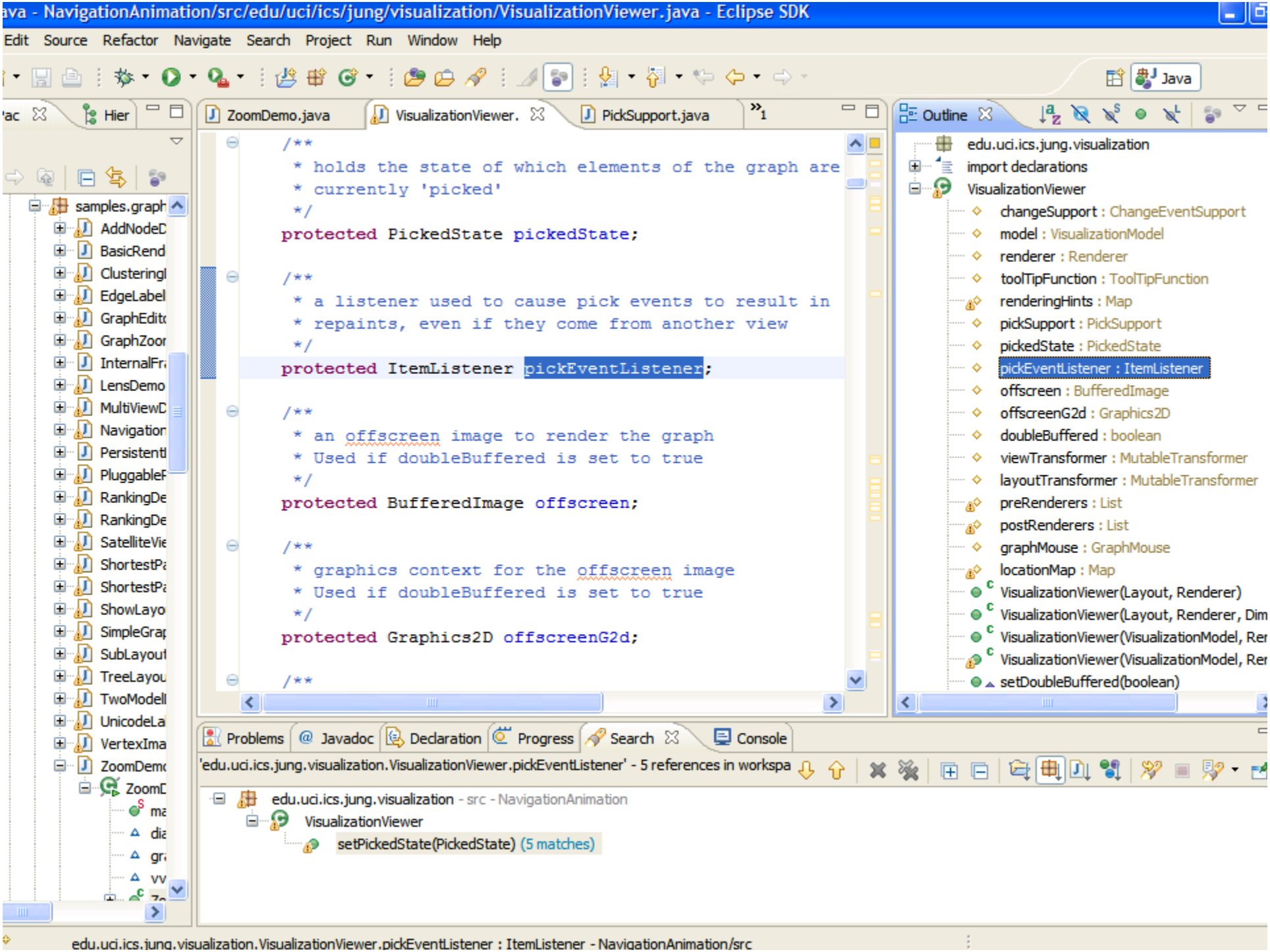
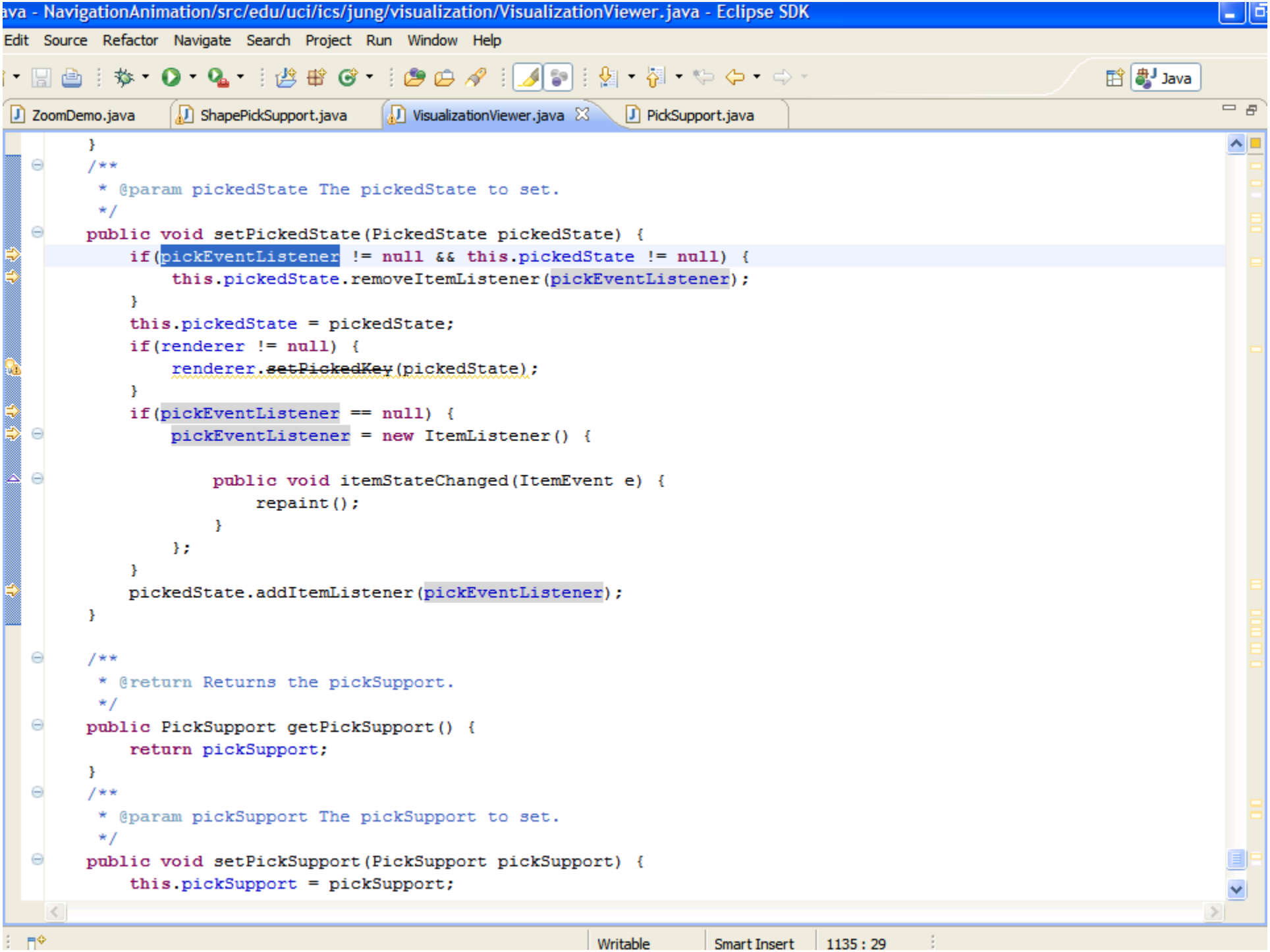
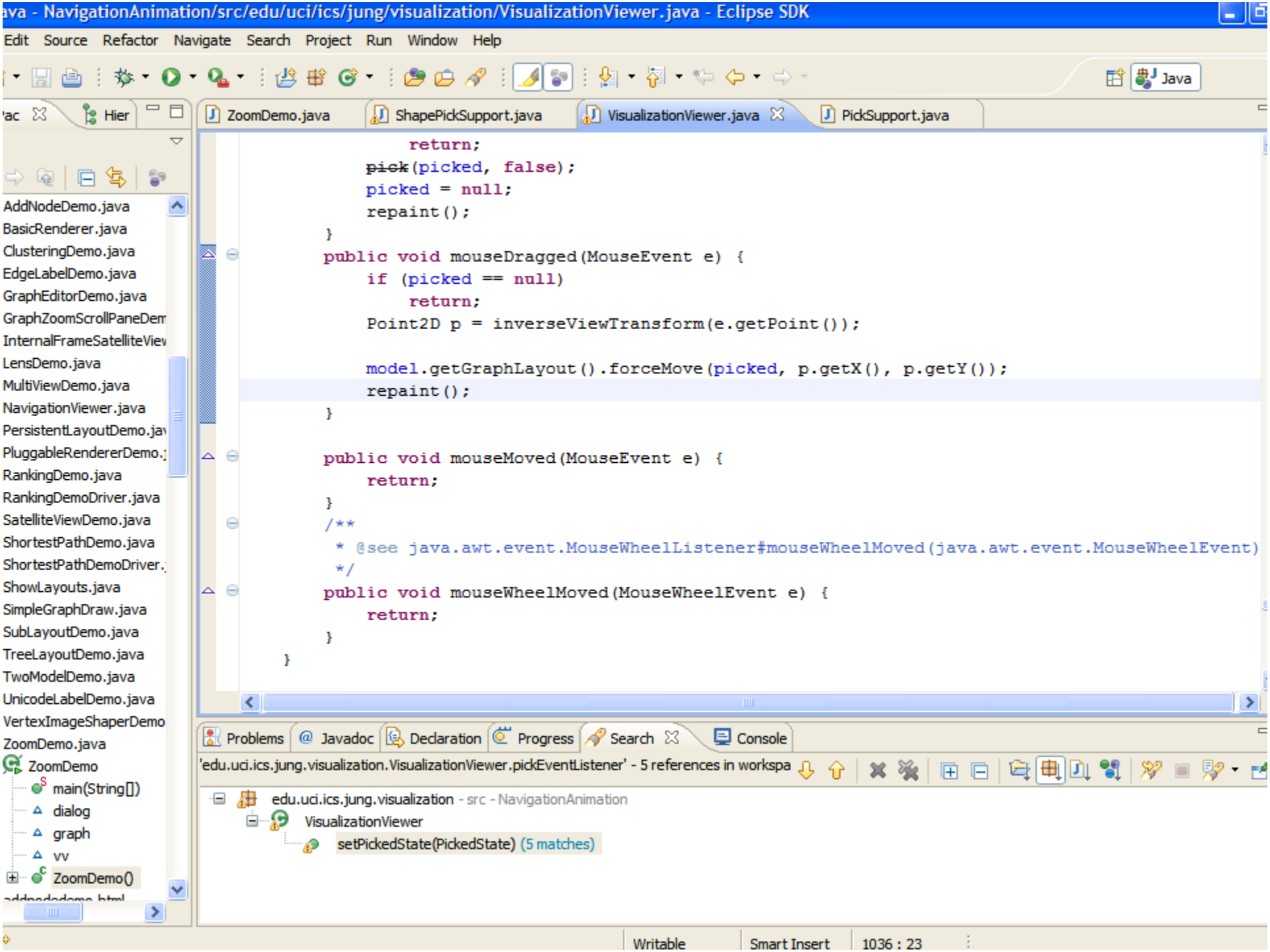
vv.setPickSupport(new ShapePickSupport());
// create a frome to hold the graph
final JFrame frame = new JFrame();
Container content = frame.getContentPane();
JPanel panel = new JPanel(new BorderLayout());
panel.add(vv);
content.add(panel);
Problems Javadoc Declaration Progress Search Console
<terminated> ZoomDemo [Java Application] C:\Program Files\Java\jre1.5.0_08\bin\jav
Writable
Smart Insert
83 : 47


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/VisualizationViewer.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
ZoomDemo.java
VisualizationViewer.
PickSupport.java
Outline
edu.uci.ics.jung.visualization
import declarations
VisualizationViewer
changeSupport : ChangeEventSupport
model : VisualizationModel
renderer : Renderer
toolTipFunction : ToolTipFunction
renderingHints : Map
pickSupport : PickSupport
pickedState : PickedState
pickEventListener : ItemListener
offscreen : BufferedImage
offscreenG2d : Graphics2D
doubleBuffered : boolean
viewTransformer : MutableTransformer
layoutTransformer : MutableTransformer
preRenderers : List
postRenderers : List
graphMouse : GraphMouse
locationMap : Map
VisualizationViewer(Layout, Renderer)
VisualizationViewer(Layout, Renderer, Dim
VisualizationViewer(VisualizationModel, Rer
VisualizationViewer(VisualizationModel, Rer
setDoubleBuffered(boolean)
protected Map locationMap = new HashMap();
/**
* Create an instance with passed parameters.
*
* @param layout The Layout to apply, with its
* @param renderer The Renderer to draw it with
*/
public VisualizationViewer(Layout layout, Renderer re
this(new DefaultVisualizationModel(layout), rende
}
/**
* Create an instance with passed parameters.
*
* @param layout The Layout to apply, with its
* @param renderer The Renderer to draw it with
* @param preferredSize the preferred size of this Vie
*/
public VisualizationViewer(Layout layout, Renderer re
this(new DefaultVisualizationModel(layout, prefer
}
Problems
Javadoc
Declaration
Progress
Search
Console
<terminated> ZoomDemo [Java Application] C:\Program Files\Java\jre1.5.0_08\bin\javaw.exe (30-Sep-07 10:03:02 AM)


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/VisualizationViewer.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
ZoomDemo.java
VisualizationViewer.
PickSupport.java
/**
* holds the state of which elements of the graph are
* currently 'picked'
*/
protected PickedState pickedState;
/**
* a listener used to cause pick events to result in
* repaints, even if they come from another view
*/
protected ItemListener pickEventListener;
/**
* an offscreen image to render the graph
* Used if doubleBuffered is set to true
*/
protected BufferedImage offscreen;
/**
* graphics context for the offscreen image
* Used if doubleBuffered is set to true
*/
protected Graphics2D offscreenG2d;
/**
Outline
edu.uci.ics.jung.visualization
import declarations
VisualizationViewer
changeSupport : ChangeEventSupport
model : VisualizationModel
renderer : Renderer
toolTipFunction : ToolTipFunction
renderingHints : Map
pickSupport : PickSupport
pickedState : PickedState
pickEventListener : ItemListener
offscreen : BufferedImage
offscreenG2d : Graphics2D
doubleBuffered : boolean
viewTransformer : MutableTransformer
layoutTransformer : MutableTransformer
preRenderers : List
postRenderers : List
graphMouse : GraphMouse
locationMap : Map
VisualizationViewer(Layout, Renderer)
VisualizationViewer(Layout, Renderer, Dim
VisualizationViewer(VisualizationModel, Rer
VisualizationViewer(VisualizationModel, Rer
setDoubleBuffered(boolean)
Problems
Javadoc
Declaration
Progress
Search
Console
'edu.uci.ics.jung.visualization.VisualizationViewer.pickEventListener' - 5 references in workspa
edu.uci.ics.jung.visualization - src - NavigationAnimation
VisualizationViewer
setPickedState(PickedState) (5 matches)
edu.uci.ics.jung.visualization.VisualizationViewer.pickEventListener : ItemListener - NavigationAnimation/src


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/VisualizationViewer.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
ZoomDemo.java
ShapePickSupport.java
VisualizationViewer.java
PickSupport.java
}
/**
* @param pickedState The pickedState to set.
*/
public void setPickedState(PickedState pickedState) {
if(pickEventListener != null && this.pickedState != null) {
this.pickedState.removeItemListener(pickEventListener);
}
this.pickedState = pickedState;
if(renderer != null) {
renderer.setPickedKey(pickedState);
}
if(pickEventListener == null) {
pickEventListener = new ItemListener() {
public void itemStateChanged(ItemEvent e) {
repaint();
}
};
}
pickedState.addItemListener(pickEventListener);
}
/**
* @return Returns the pickSupport.
*/
public PickSupport getPickSupport() {
return pickSupport;
}
/**
* @param pickSupport The pickSupport to set.
*/
public void setPickSupport(PickSupport pickSupport) {
this.pickSupport = pickSupport;
Writable
Smart Insert
1135 : 29


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/VisualizationViewer.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
Hier
ZoomDemo.java
ShapePickSupport.java
VisualizationViewer.java
PickSupport.java
return;
pick(picked, false);
picked = null;
repaint();
}
public void mouseDragged(MouseEvent e) {
if (picked == null)
return;
Point2D p = inverseViewTransform(e.getPoint());
model.getGraphLayout().forceMove(picked, p.getX(), p.getY());
repaint();
}
public void mouseMoved(MouseEvent e) {
return;
}
/**
* @see java.awt.event.MouseWheelListener#mouseWheelMoved(java.awt.event.MouseWheelEvent)
*/
public void mouseWheelMoved(MouseWheelEvent e) {
return;
}
}
AddNodeDemo.java
BasicRenderer.java
ClusteringDemo.java
EdgeLabelDemo.java
GraphEditorDemo.java
LensDemo.java
MultiViewDemo.java
NavigationViewer.java
RankingDemo.java
RankingDemoDriver.java
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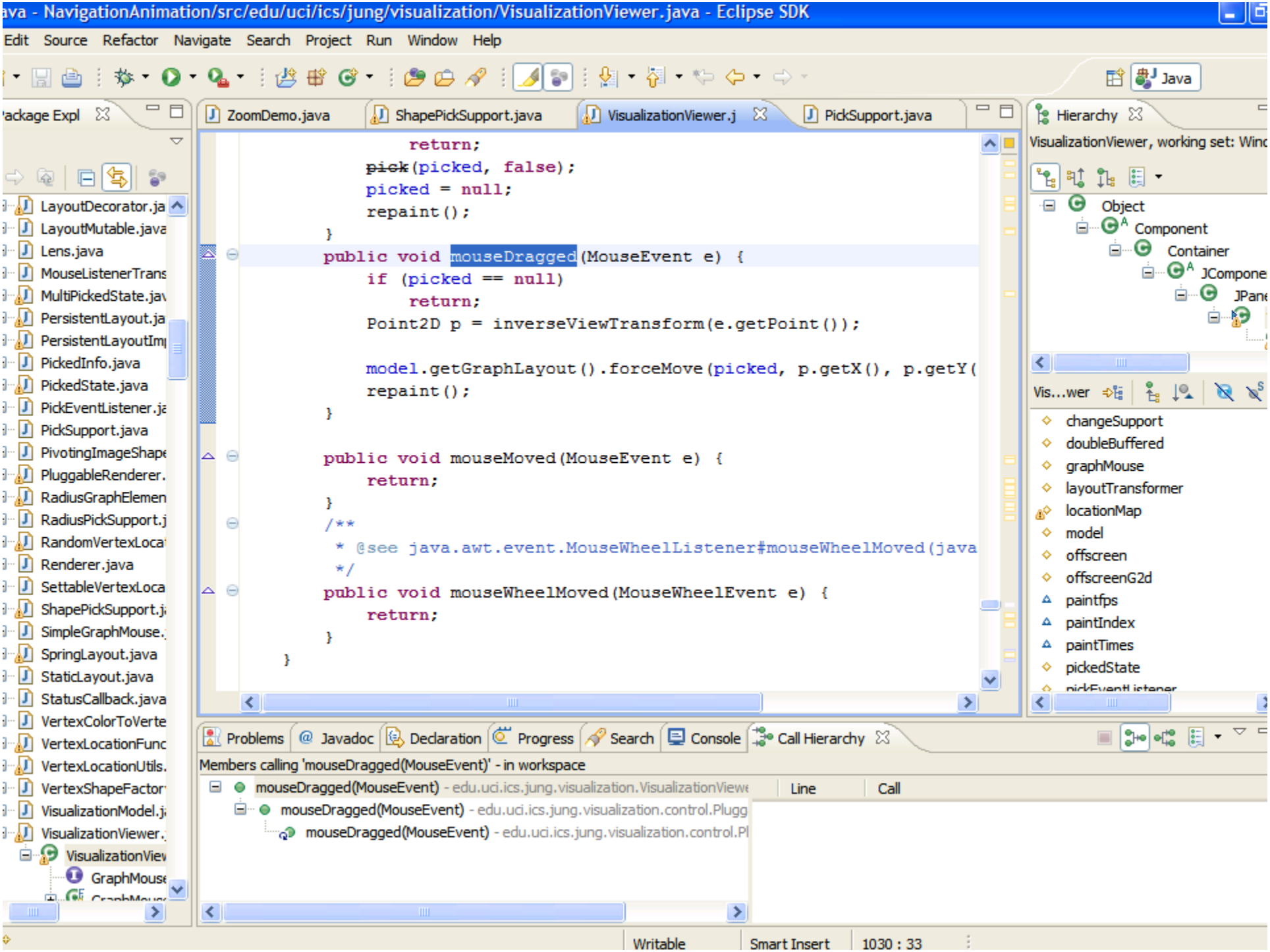
VertexImageShaperDemo
ZoomDemo.java
ZoomDemo
main(String[])
dialog
graph
vv
ZoomDemo()
Problems
Javadoc
Declaration
Progress
Search
Console
'edu.uci.ics.jung.visualization.VisualizationViewer.pickEventListener' - 5 references in workspa
edu.uci.ics.jung.visualization - src - NavigationAnimation
VisualizationViewer
setPickedState(PickedState) (5 matches)
Writable
Smart Insert
1036 : 23


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/VisualizationViewer.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
ackage Expl
ZoomDemo.java
ShapePickSupport.java
VisualizationViewer.j
PickSupport.java
return;
pick(picked, false);
picked = null;
repaint();
}
public void mouseDragged(MouseEvent e) {
if (picked == null)
return;
Point2D p = inverseViewTransform(e.getPoint());
model.getGraphLayout().forceMove(picked, p.getX(), p.getY(
repaint();
}
public void mouseMoved(MouseEvent e) {
return;
}
/**
* @see java.awt.event.MouseWheelListener#mouseWheelMoved(java
*/
public void mouseWheelMoved(MouseWheelEvent e) {
return;
}
}
Hierarchy
VisualizationViewer, working set: Winc
Object
Component
Container
JCompone
JPane
Vis...wer
changeSupport
doubleBuffered
graphMouse
layoutTransformer
locationMap
model
offscreen
offscreenG2d
paintfps
paintIndex
paintTimes
pickedState
LayoutDecorator.ja
LayoutMutable.java
Lens.java
MouseListenerTrans
MultiPickedState.jav
PersistentLayout.ja
PersistentLayoutImp
PickedInfo.java
PickedState.java
PickEventListener.ja
PickSupport.java
PivotingImageShape
PluggableRenderer.
RadiusGraphElemen
RadiusPickSupport.j
RandomVertexLocat
Renderer.java
SettableVertexLoca
ShapePickSupport.j
SimpleGraphMouse.
SpringLayout.java
StaticLayout.java
StatusCallback.java
VertexColorToVerte
VertexLocationFunc
VertexLocationUtils.
VertexShapeFactor
VisualizationModel.j
VisualizationViewer.
VisualizationViev
GraphMouse
Problems
Javadoc
Declaration
Progress
Search
Console
Call Hierarchy
Members calling 'mouseDragged(MouseEvent)' - in workspace
mouseDragged(MouseEvent) - edu.uci.ics.jung.visualization.VisualizationViewe
mouseDragged(MouseEvent) - edu.uci.ics.jung.visualization.control.Plugg
mouseDragged(MouseEvent) - edu.uci.ics.jung.visualization.control.Pl
Line
Call
Writable
Smart Insert
1030 : 33

information

source code

search results

file containment

type hierarchy

class structure

overload ?

50 lines

3 search hits

60 file items

5 type items

25 class items

information overload?

source code

search results

file containment

type hierarchy

slass structure

grows to
hundreds
and
thousands
for
complete task

mismatch

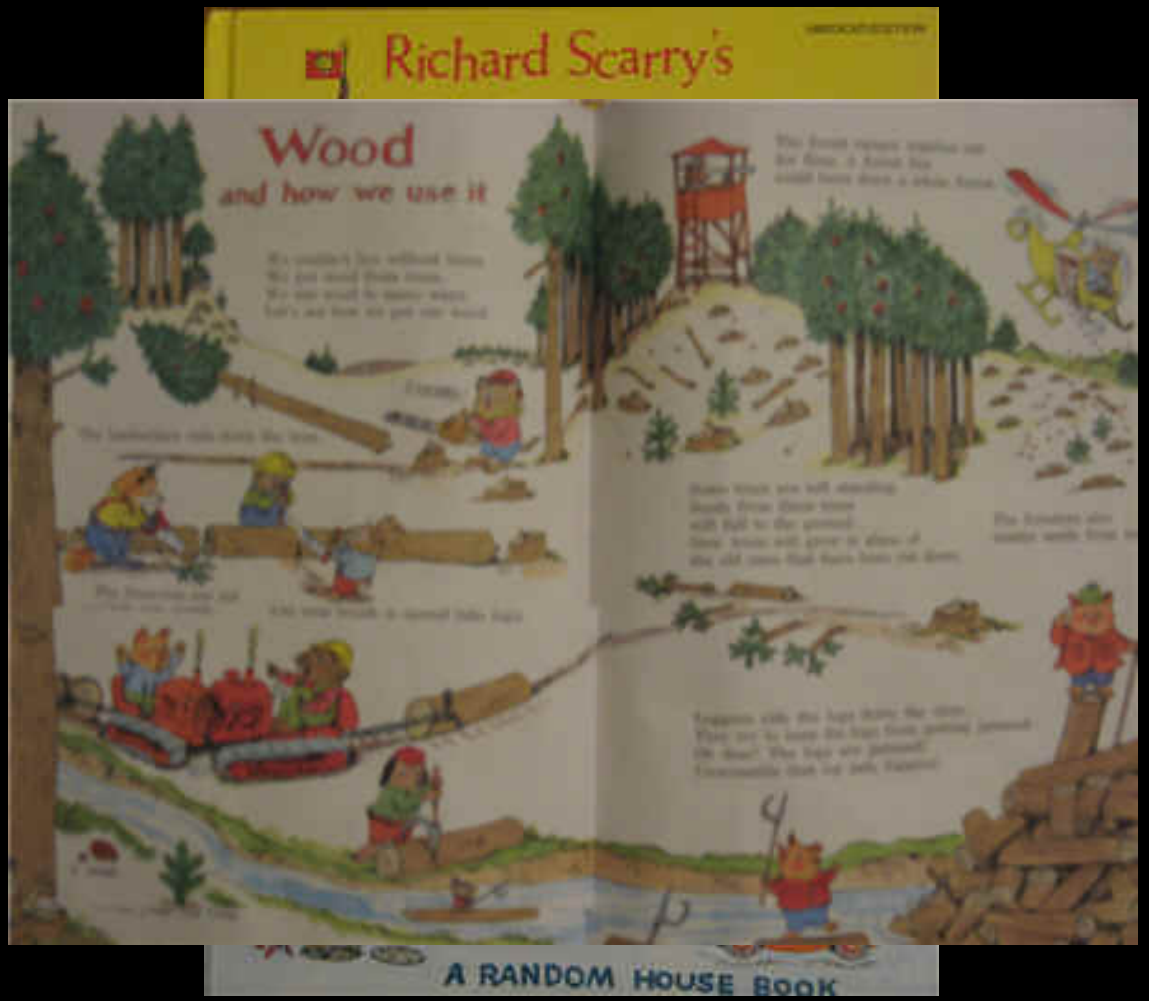
Cartoon not licensed for web version

this talk is about…

mismatches between
programmers and tools

enabling focus and flow for
programmers

understanding mismatches



understanding mismatches

mismatch #1

questions programmers ask

vs.

questions tools answer

Which type represents this domain concept?

Who implements this interface?

What are the differences between these types?

What are the parts of this type?

How are these types related?

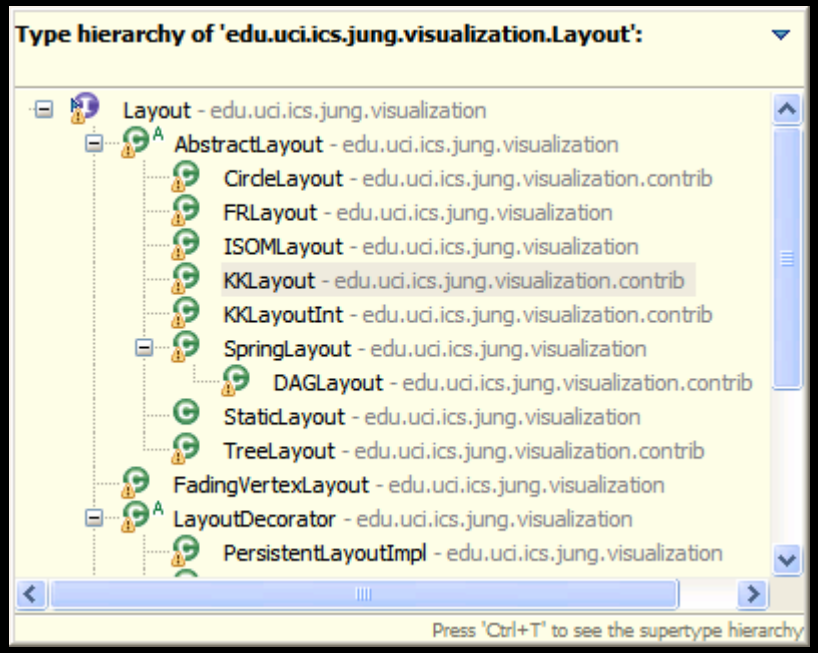
...

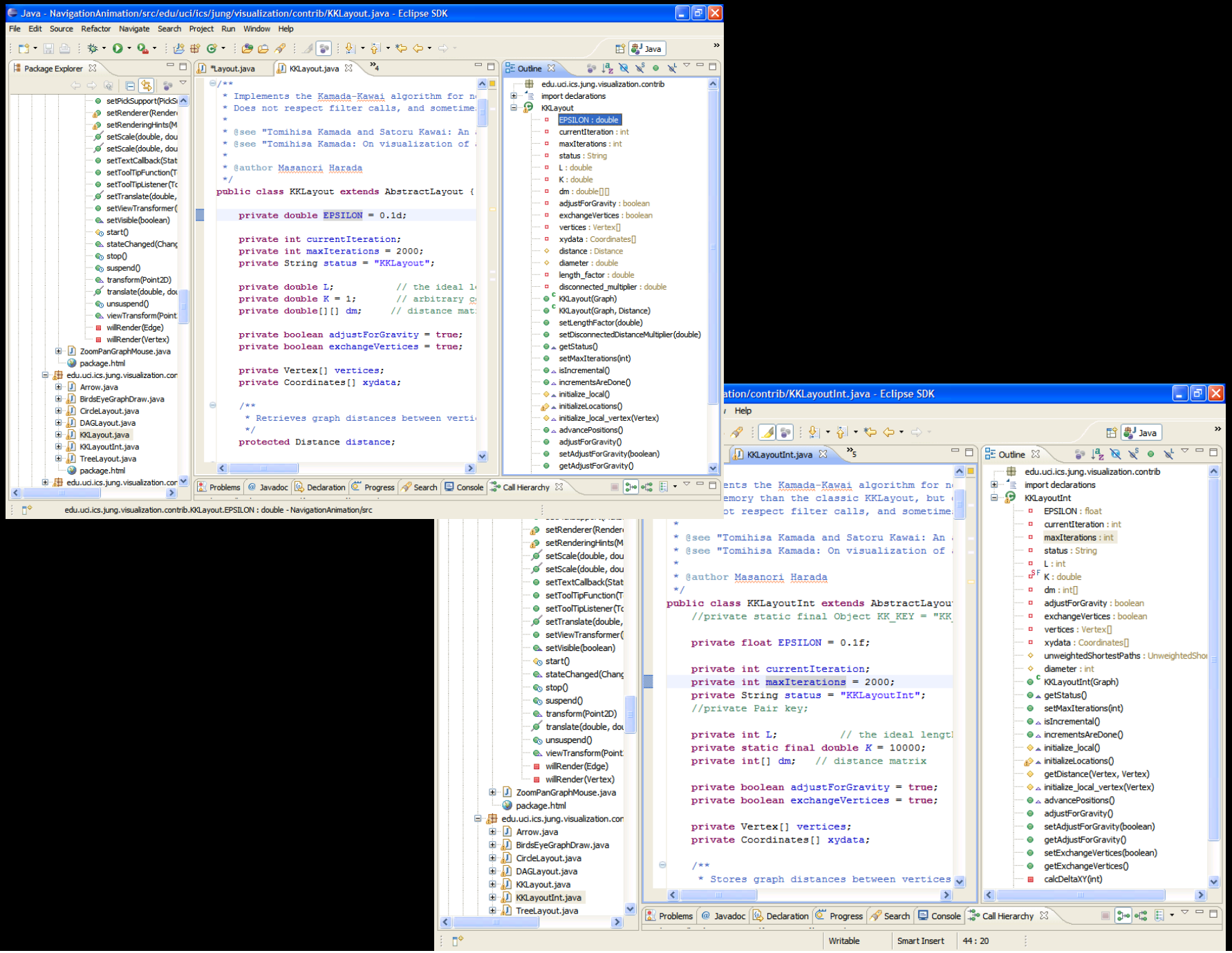
What data can we access from this object?

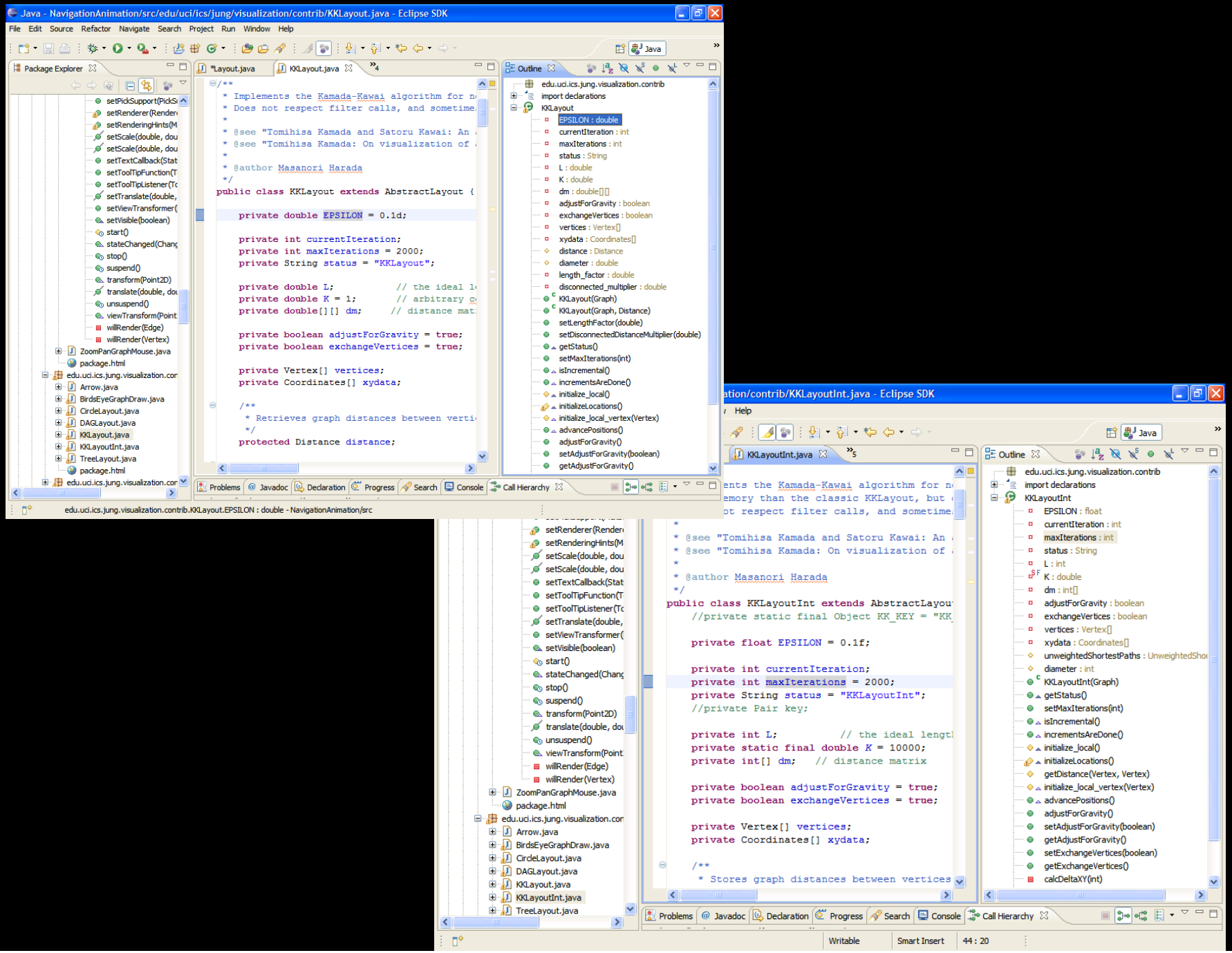
What code is involved in the implementation of this behaviour?

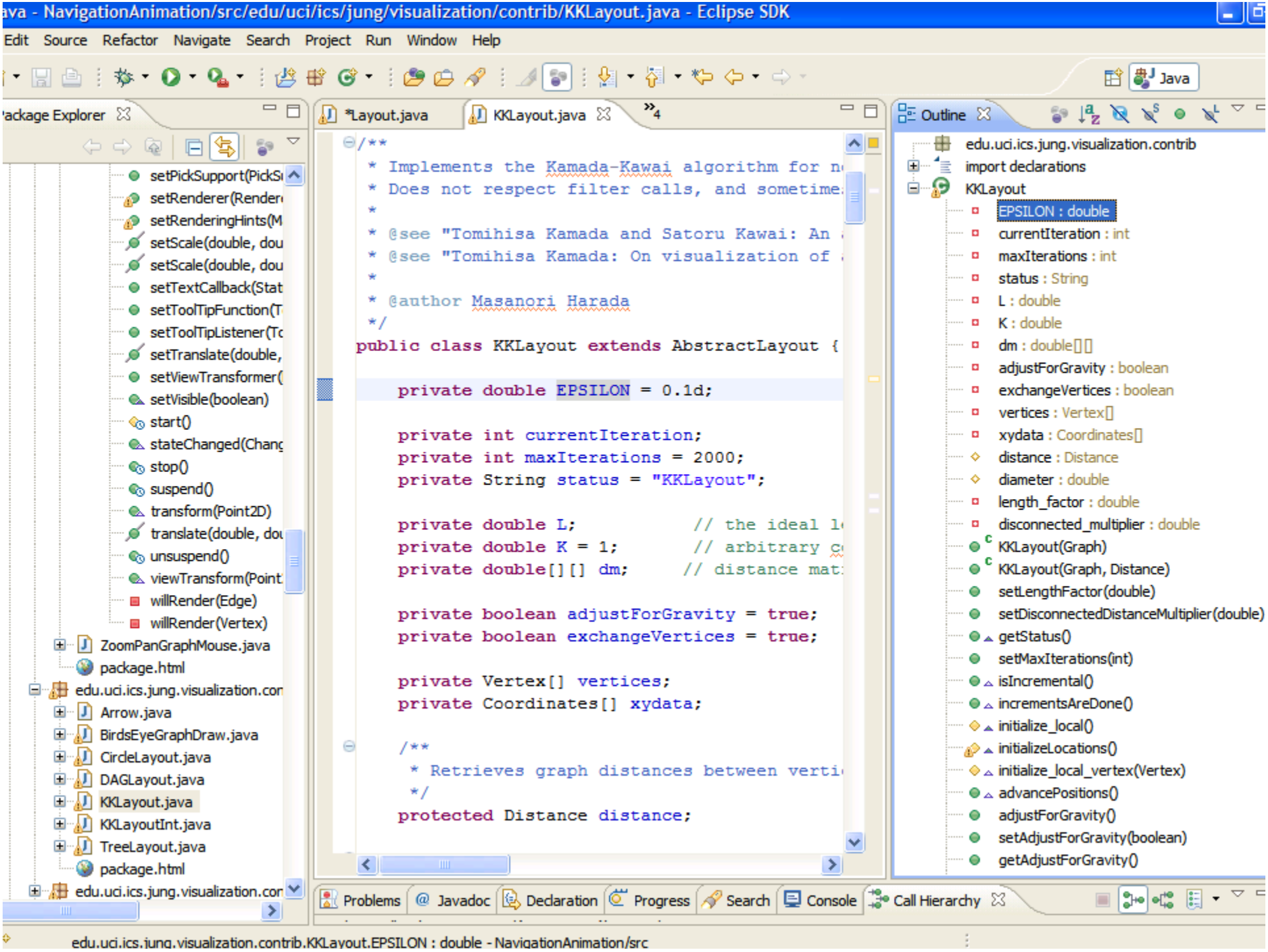
Sillito, Murphy, De Volder, FSE 2006

What are the differences between these types?




Java - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayout.java - Eclipse SDK
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
KKLayout.java
Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayout
EPSILON : double
currentIteration : int
maxIterations : int
status : String
L : double
K : double
dm : double[][]
adjustForGravity : boolean
exchangeVertices : boolean
vertices : Vertex[]
xydata : Coordinates[]
distance : Distance
diameter : double
length_factor : double
disconnected_multiplier : double
KKLayout(Graph)
KKLayout(Graph, Distance)
setLengthFactor(double)
setDisconnectedDistanceMultiplier(double)
getStatus()
setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
initialize_local_vertex(Vertex)
advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
public class KKLayout extends AbstractLayout {
private double EPSILON = 0.1d;
private int currentIteration;
private int maxIterations = 2000;
private String status = "KKLayout";
private double L;
private double K = 1;
private double[][] dm;
private boolean adjustForGravity = true;
private boolean exchangeVertices = true;
private Vertex[] vertices;
private Coordinates[] xydata;
protected Distance distance;
Problems Javadoc Declaration Progress Search Console Call Hierarchy
edu.uci.ics.jung.visualization.contrib.KKLayout.EPSILON : double - NavigationAnimation/src
KKLayoutInt.java - Eclipse SDK
KKLayoutInt.java
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayoutInt
EPSILON : float
currentIteration : int
maxIterations : int
status : String
L : int
K : double
dm : int[]
adjustForGravity : boolean
exchangeVertices : boolean
vertices : Vertex[]
xydata : Coordinates[]
diameter : int
KKLayoutInt(Graph)
getStatus()
setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
getDistance(Vertex, Vertex)
initialize_local_vertex(Vertex)
advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
setExchangeVertices(boolean)
getExchangeVertices()
calcDeltaXY(int)
public class KKLayoutInt extends AbstractLayou
//private static final Object KK_KEY = "KK
private float EPSILON = 0.1f;
private int currentIteration;
private int maxIterations = 2000;
private String status = "KKLayoutInt";
//private Pair key;
private int L;
private static final double K = 10000;
private int[] dm;
private boolean adjustForGravity = true;
private boolean exchangeVertices = true;
private Vertex[] vertices;
private Coordinates[] xydata;
* Stores graph distances between vertices
Problems Javadoc Declaration Progress Search Console Call Hierarchy
Writable
Smart Insert
44 : 20


Java - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayout.java - Eclipse SDK
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
KKLayout.java
Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayout
EPSILON : double
currentIteration : int
maxIterations : int
status : String
L : double
K : double
dm : double[][]
adjustForGravity : boolean
exchangeVertices : boolean
vertices : Vertex[]
xydata : Coordinates[]
distance : Distance
diameter : double
length_factor : double
disconnected_multiplier : double
KKLayout(Graph)
KKLayout(Graph, Distance)
setLengthFactor(double)
setDisconnectedDistanceMultiplier(double)
getStatus()
setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
initialize_local_vertex(Vertex)
advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
public class KKLayout extends AbstractLayout {
private double EPSILON = 0.1d;
private int currentIteration;
private int maxIterations = 2000;
private String status = "KKLayout";
private double L;
private double K = 1;
private double[][] dm;
private boolean adjustForGravity = true;
private boolean exchangeVertices = true;
private Vertex[] vertices;
private Coordinates[] xydata;
protected Distance distance;
Problems Javadoc Declaration Progress Search Console Call Hierarchy
edu.uci.ics.jung.visualization.contrib.KKLayout.EPSILON : double - NavigationAnimation/src
KKLayoutInt.java - Eclipse SDK
KKLayoutInt.java
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayoutInt
EPSILON : float
currentIteration : int
maxIterations : int
status : String
L : int
K : double
dm : int[]
adjustForGravity : boolean
exchangeVertices : boolean
vertices : Vertex[]
xydata : Coordinates[]
diameter : int
KKLayoutInt(Graph)
getStatus()
setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
getDistance(Vertex, Vertex)
initialize_local_vertex(Vertex)
advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
setExchangeVertices(boolean)
getExchangeVertices()
calcDeltaXY(int)
public class KKLayoutInt extends AbstractLayou
//private static final Object KK_KEY = "KK
private float EPSILON = 0.1f;
private int currentIteration;
private int maxIterations = 2000;
private String status = "KKLayoutInt";
//private Pair key;
private int L;
private static final double K = 10000;
private int[] dm;
private boolean adjustForGravity = true;
private boolean exchangeVertices = true;
private Vertex[] vertices;
private Coordinates[] xydata;
* Stores graph distances between vertices
Problems Javadoc Declaration Progress Search Console Call Hierarchy
Writable
Smart Insert
44 : 20


ava - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayout.java - Eclipse SDK
Edit Source Refactor Navigate Search Project Run Window Help
Java
ackage Explorer
setPickSupport(PickS
setRenderer(Render
setRenderingHints(M
setScale(double, dou
setScale(double, dou
setTextCallback(Stat
setToolTipFunction(T
setToolTipListener(To
setTranslate(double,
setViewTransformer(
setVisible(boolean)
start()
stateChanged(Chang
stop()
suspend()
transform(Point2D)
translate(double, dou
unsuspend()
viewTransform(Point
willRender(Edge)
willRender(Vertex)
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Arrow.java
BirdsEyeGraphDraw.java
CircleLayout.java
DAGLayout.java
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KKLayoutInt.java
TreeLayout.java
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*Layout.java
KKLayout.java
4
/**
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* Does not respect filter calls, and sometime
*
* @see "Tomihisa Kamada and Satoru Kawai: An
* @see "Tomihisa Kamada: On visualization of
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* @author Masanori Harada
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private double K = 1; // arbitrary c
private double[][] dm; // distance mat
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private Coordinates[] xydata;
/**
* Retrieves graph distances between verti
*/
protected Distance distance;
Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayout
EPSILON : double
currentIteration : int
maxIterations : int
status : String
L : double
K : double
dm : double[][]
adjustForGravity : boolean
exchangeVertices : boolean
vertices : Vertex[]
xydata : Coordinates[]
distance : Distance
diameter : double
length_factor : double
disconnected_multiplier : double
KKLayout(Graph)
KKLayout(Graph, Distance)
setLengthFactor(double)
setDisconnectedDistanceMultiplier(double)
getStatus()
setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
initialize_local_vertex(Vertex)
advancePositions()
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getAdjustForGravity()
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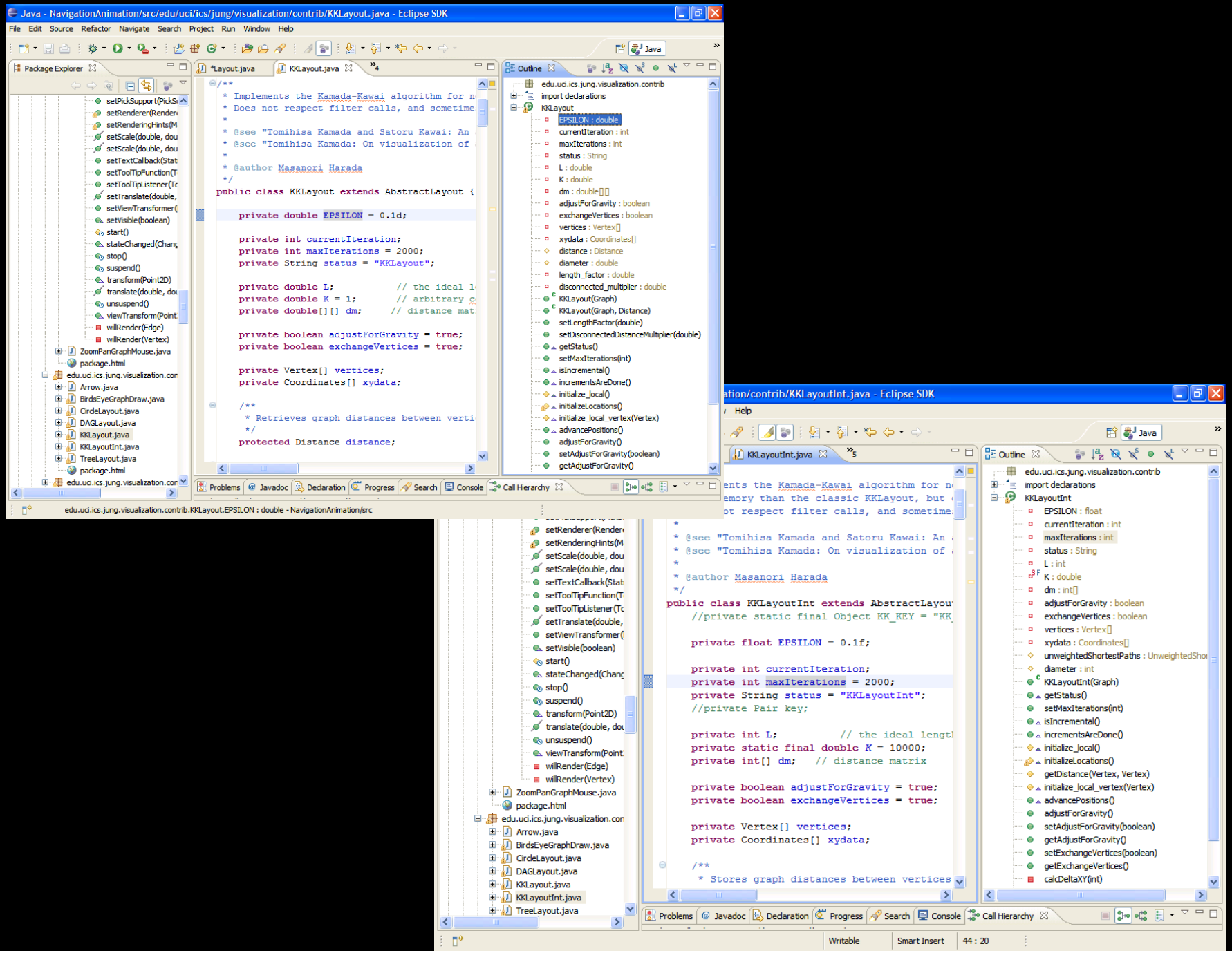
Call Hierarchy
edu.uci.ics.jung.visualization.contrib.KKLayout.EPSILON : double - NavigationAnimation/src


Java - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayout.java - Eclipse SDK
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Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayout
EPSILON : double
currentIteration : int
maxIterations : int
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KKLayout(Graph, Distance)
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Problems Javadoc Declaration Progress Search Console Call Hierarchy
edu.uci.ics.jung.visualization.contrib.KKLayout.EPSILON : double - NavigationAnimation/src
KKLayoutInt.java - Eclipse SDK
KKLayoutInt.java
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import declarations
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currentIteration : int
maxIterations : int
status : String
L : int
K : double
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adjustForGravity : boolean
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incrementsAreDone()
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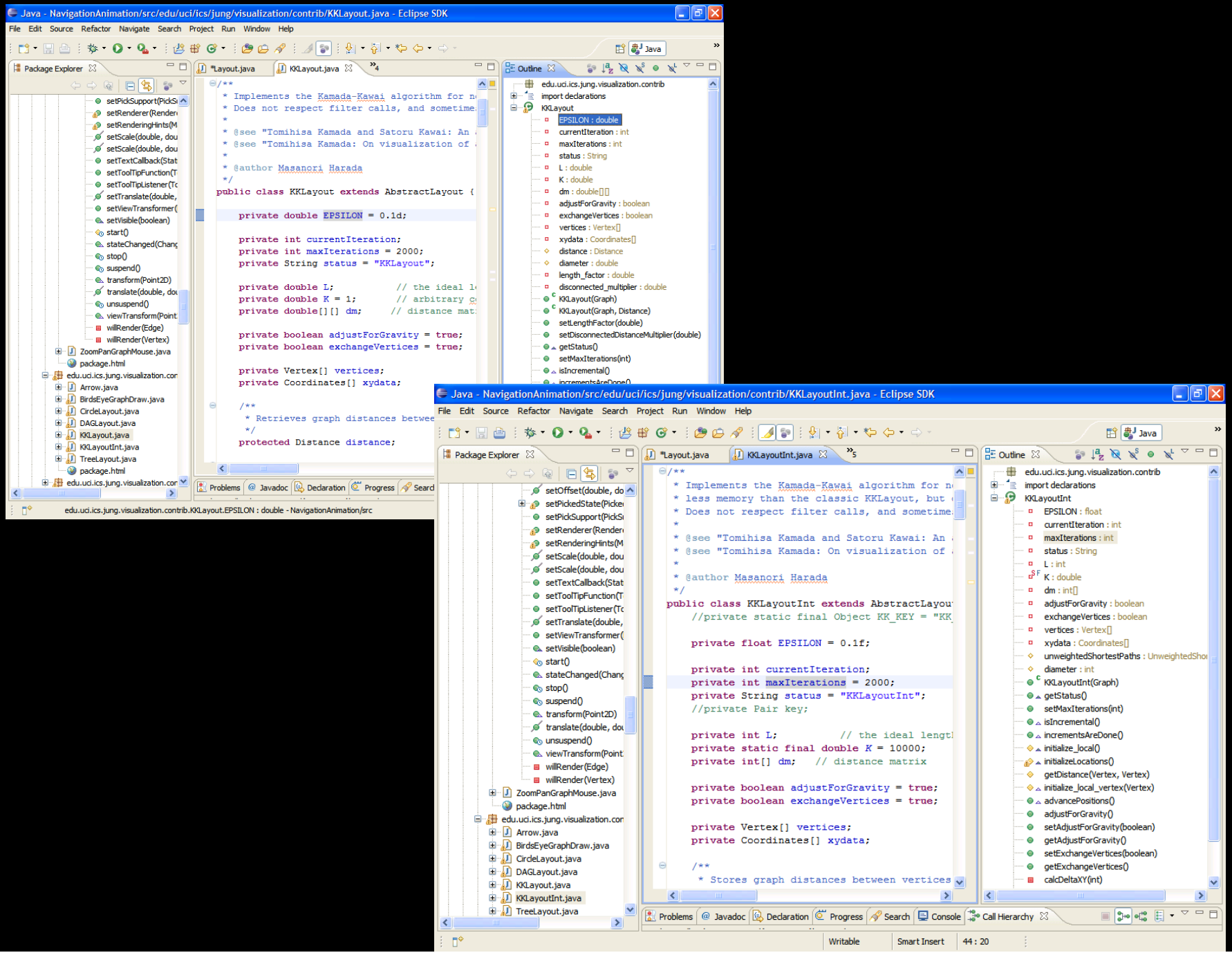
initializeLocations()
getDistance(Vertex, Vertex)
initialize_local_vertex(Vertex)
advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
setExchangeVertices(boolean)
getExchangeVertices()
calcDeltaXY(int)
public class KKLayoutInt extends AbstractLayou
//private static final Object KK_KEY = "KK
private float EPSILON = 0.1f;
private int currentIteration;
private int maxIterations = 2000;
private String status = "KKLayoutInt";
//private Pair key;
private int L;
private static final double K = 10000;
private int[] dm;
private boolean adjustForGravity = true;
private boolean exchangeVertices = true;
private Vertex[] vertices;
private Coordinates[] xydata;
* Stores graph distances between vertices
Problems Javadoc Declaration Progress Search Console Call Hierarchy
Writable
Smart Insert
44 : 20


Java - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayout.java - Eclipse SDK
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*Layout.java
KKLayout.java
Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayout
EPSILON : double
currentIteration : int
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L : double
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* Retrieves graph distances betwee
protected Distance distance;
Problems Javadoc Declaration Progress Search
edu.uci.ics.jung.visualization.contrib.KKLayout.EPSILON : double - NavigationAnimation/src
Java - NavigationAnimation/src/edu/uci/ics/jung/visualization/contrib/KKLayoutInt.java - Eclipse SDK
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*Layout.java
KKLayoutInt.java
Outline
edu.uci.ics.jung.visualization.contrib
import declarations
KKLayoutInt
EPSILON : float
currentIteration : int
maxIterations : int
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L : int
K : double
dm : int[]
adjustForGravity : boolean
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vertices : Vertex[]
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incrementsAreDone()
initialize_local()
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getDistance(Vertex, Vertex)
initialize_local_vertex(Vertex)
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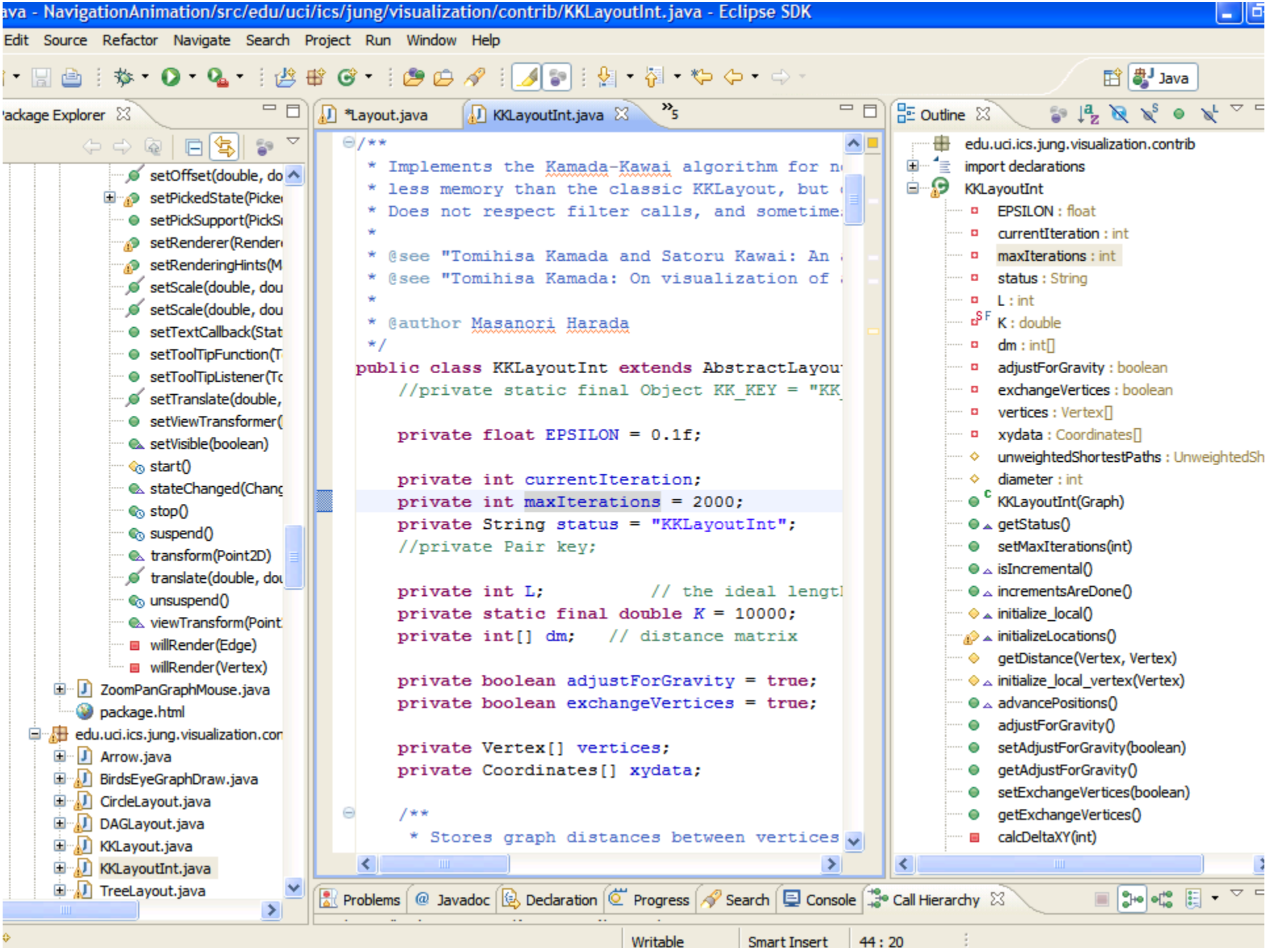
Problems Javadoc Declaration Progress Search Console Call Hierarchy
Writable Smart Insert 44 : 20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advancePositions()
adjustForGravity()
setAdjustForGravity(boolean)
getAdjustForGravity()
setExchangeVertices(boolean)
getExchangeVertices()
calcDeltaXY(int)
Problems Javadoc Declaration Progress Search Console Call Hierarchy
Writable
Smart Insert
44 : 20

mismatch #2

information programmers need

vs.

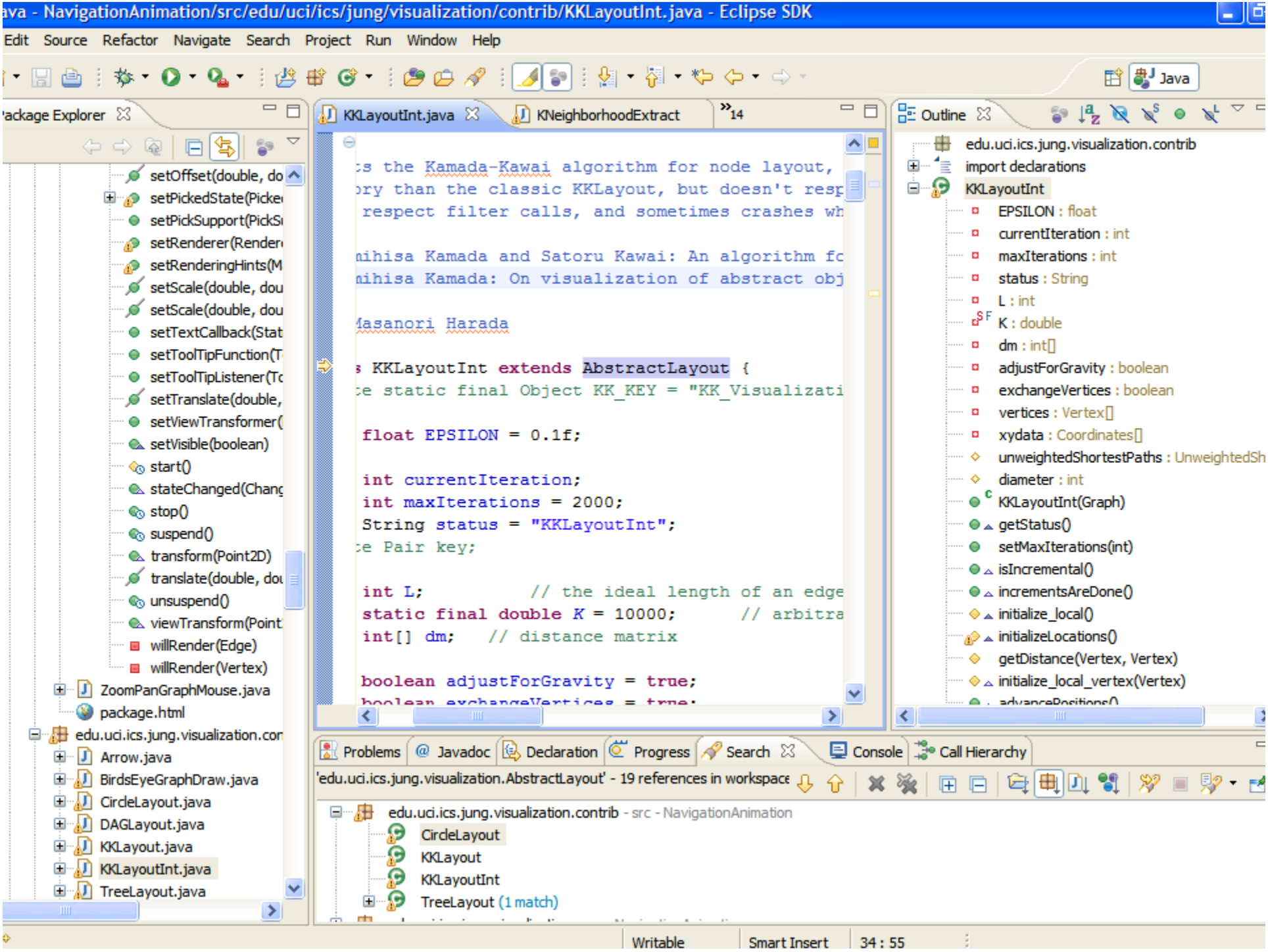
information tools show

"In a delocalized plan, pieces of code that are conceptually related are physically located in non-contiguous parts of the program"

— *Soloway, Pinto, Letovsky, Littman and Lampert, CACM 1988*

"the programmers' central goal for each maintenance task was to collect a *working set* of task-relevant code fragments"

— *Ko, Aung, Myers, ICSE 2005*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setToolTipListener(To
setTranslate(double,
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setVisible(boolean)
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KKLayout.java
KKLayoutInt.java
TreeLayout.java
KKLayoutInt.java
KNeighborhoodExtract
14
cs the Kamada-Kawai algorithm for node layout,
ory than the classic KKLayout, but doesn't resp
respect filter calls, and sometimes crashes wh
mihisa Kamada and Satoru Kawai: An algorithm fo
mihisa Kamada: On visualization of abstract obj
Masanori Harada
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setMaxIterations(int)
isIncremental()
incrementsAreDone()
initialize_local()
initializeLocations()
getDistance(Vertex, Vertex)
initialize_local_vertex(Vertex)
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edu.uci.ics.jung.visualization.contrib - src - NavigationAnimation
CircleLayout
KKLayout
KKLayoutInt
TreeLayout (1 match)
Writable
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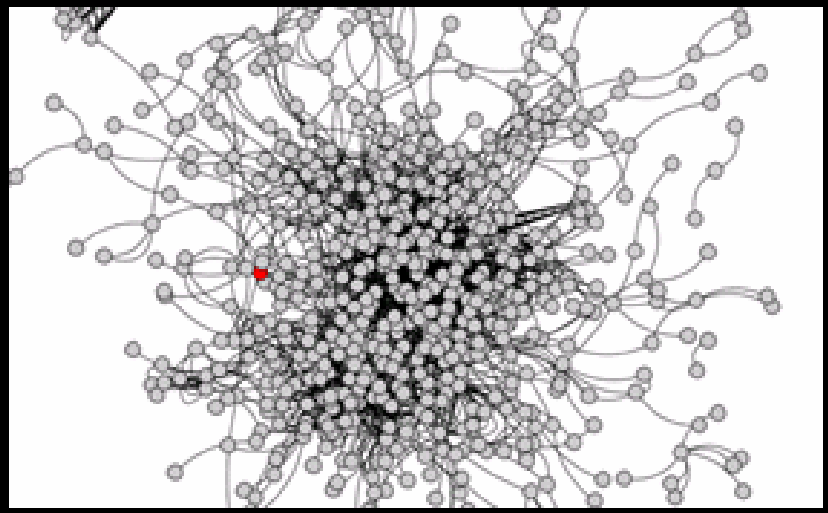
34 : 55

mismatch #3

strategies programmers use

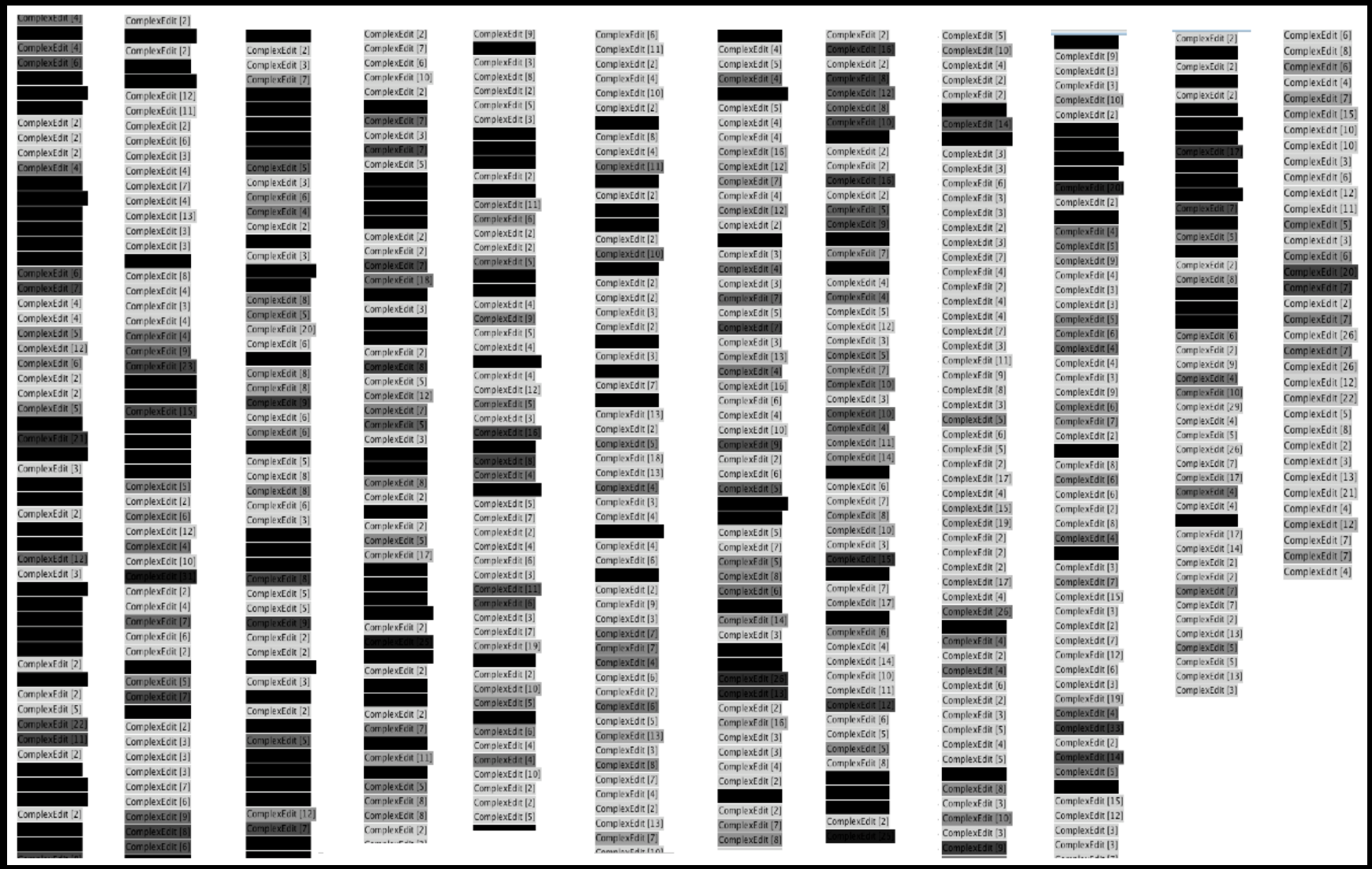
vs.

strategies tools support



click to play animations (avi)

Allen, Murphy, de Alwis, 2007



Shepherd, Murphy, 2007

this talk is about...

mismatches between
programmers and tools

1. questions
2. information
3. strategies

enabling focus and flow for
programmers

flow

focus

focus

flow

focus

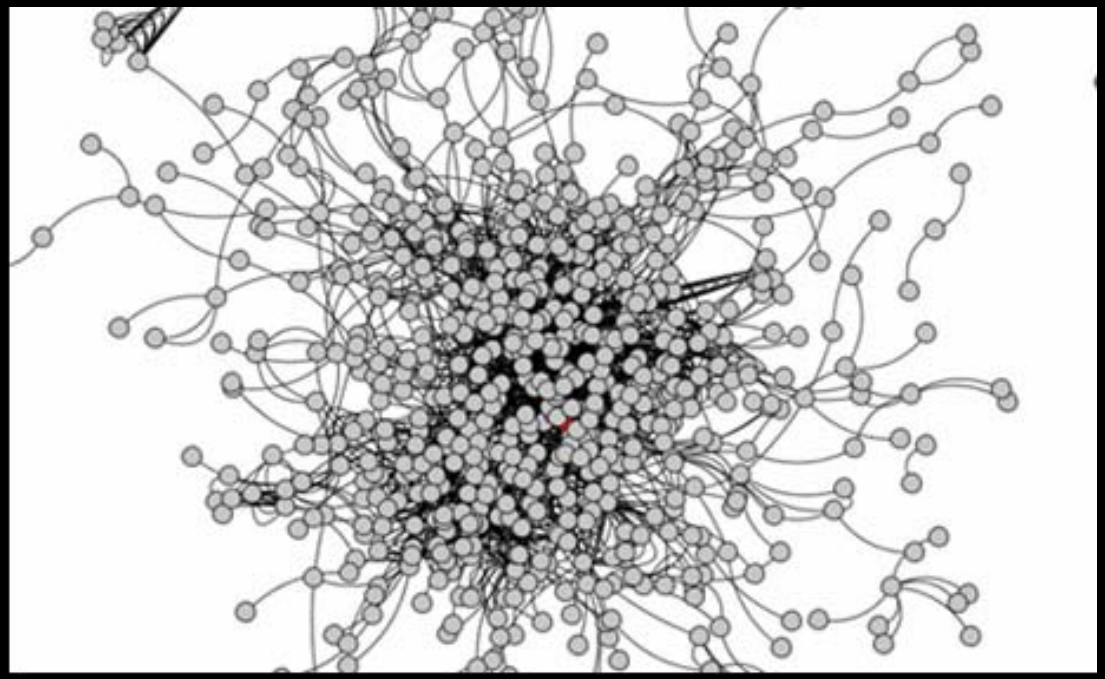
focus

click to play animations (avi)

flow

click to play animations (avi)

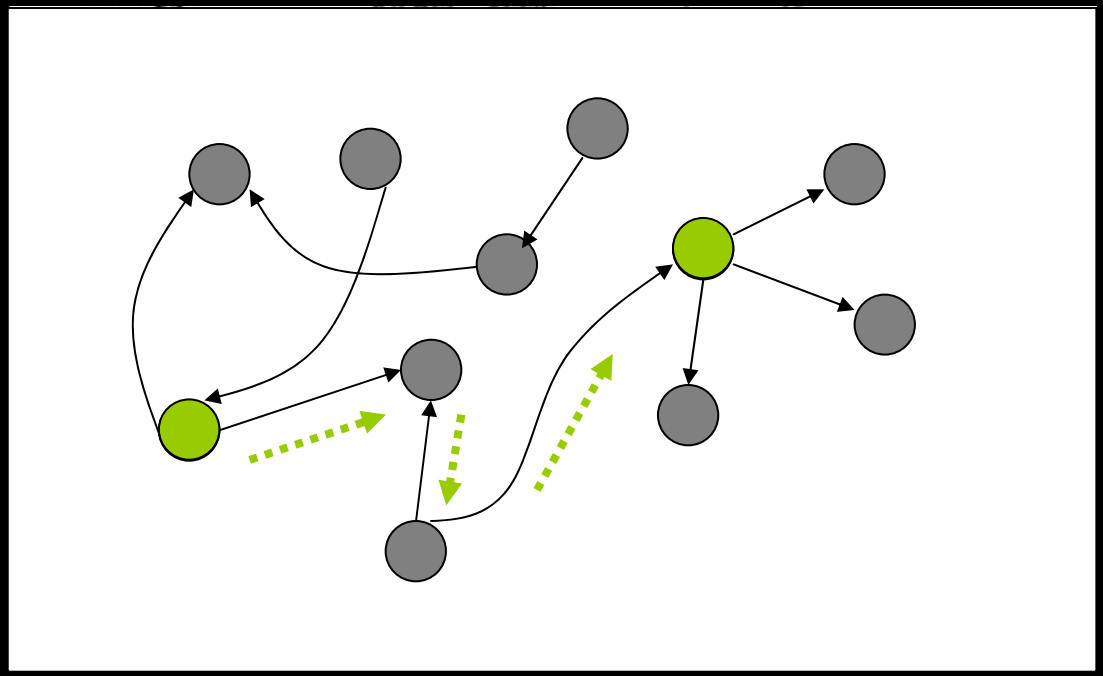
enabling **focus** and **flow**



structure

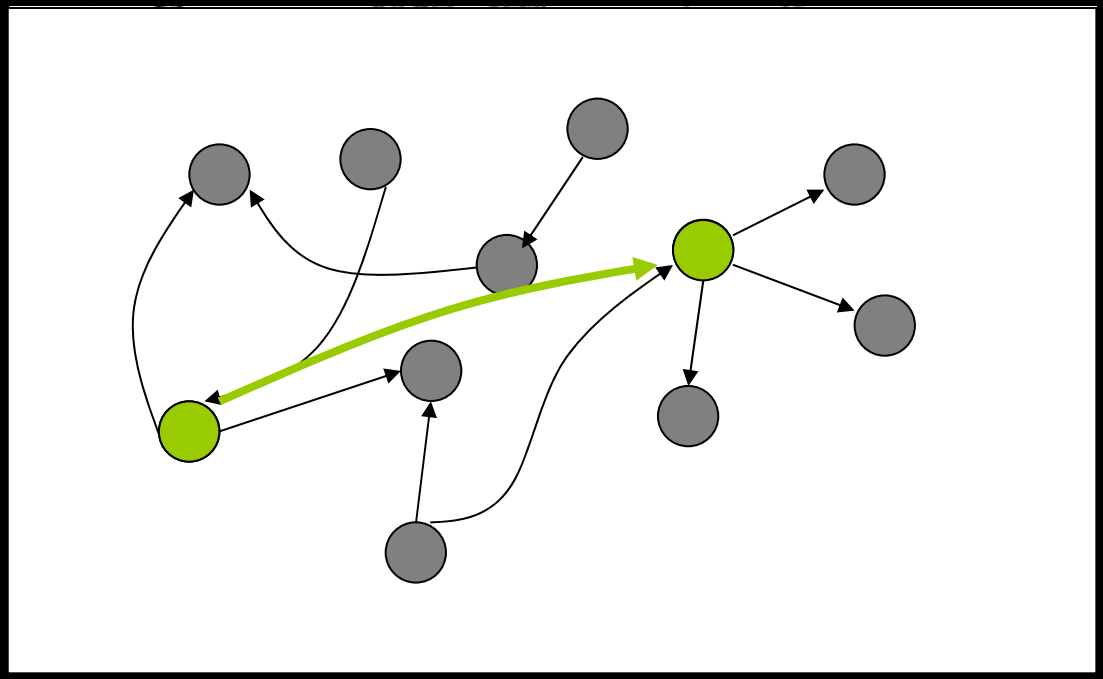
mismatch #1: questions

currently



mismatch #1: questions

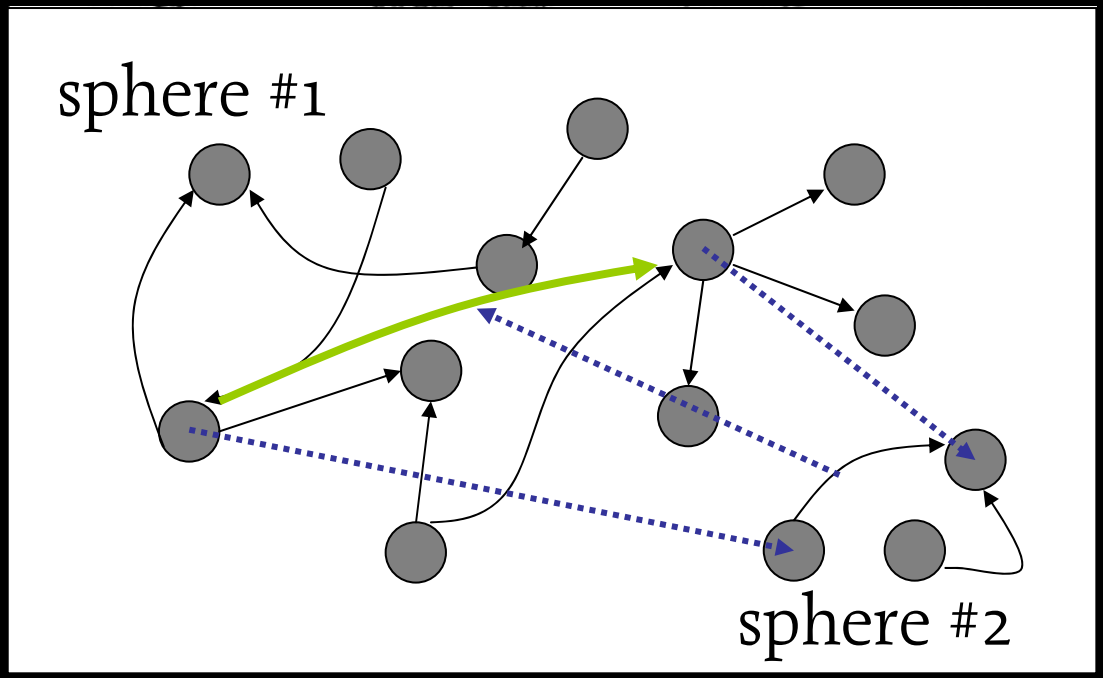
with Ferret



de Alwis, Murphy, 2007

mismatch #1: questions

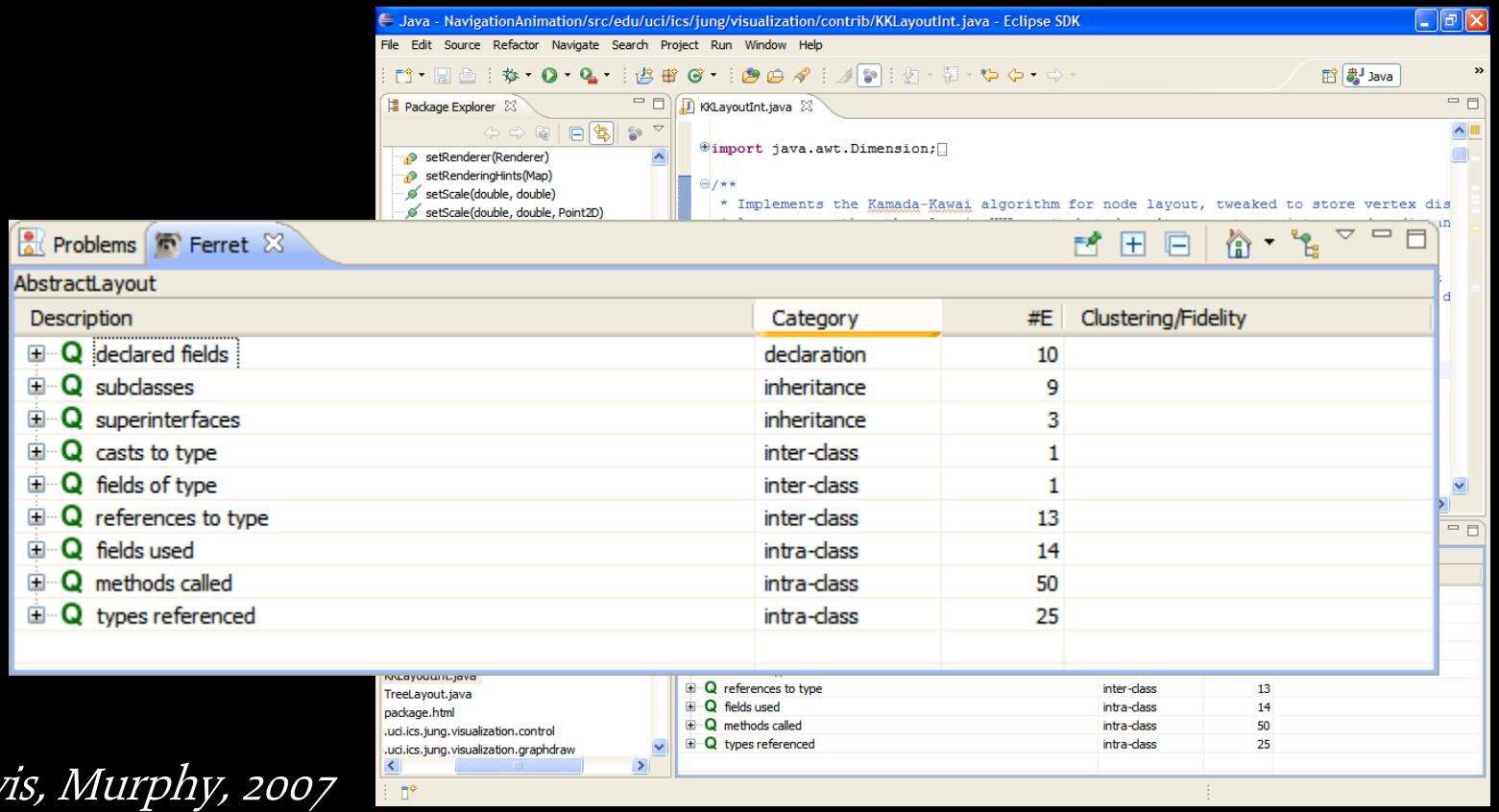
with Ferret



de Alwis, Murphy, 2007

mismatch #1: questions

with Ferret



de Alwis, Murphy, 2007

mismatch #1: questions

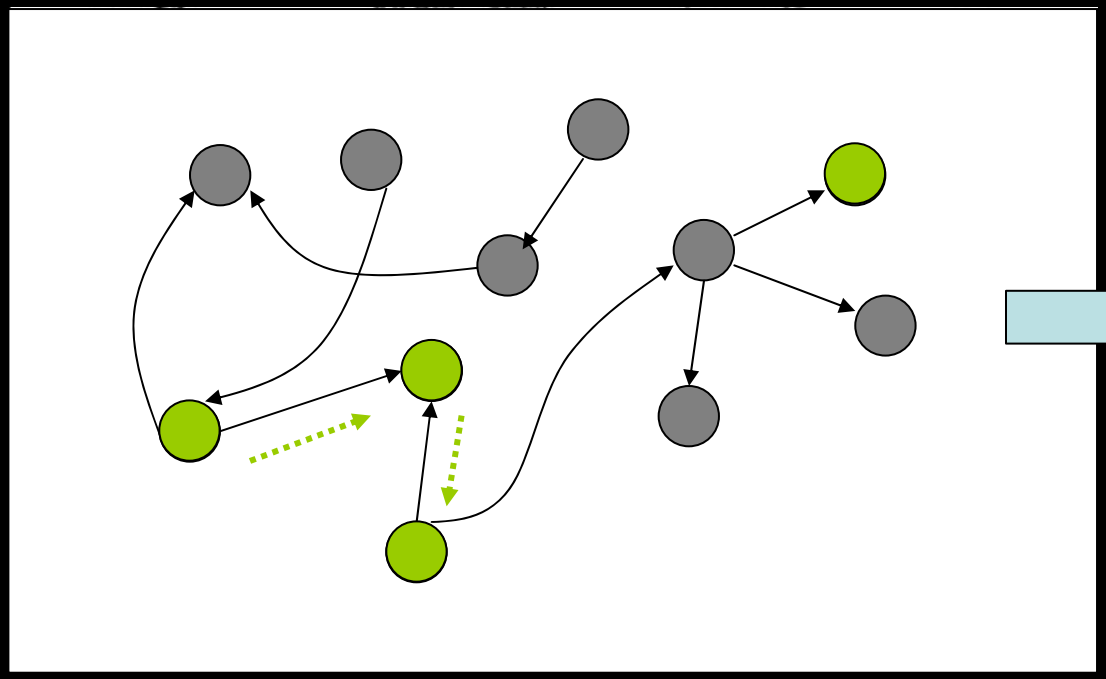
with Ferret

focus flow

based on a small diary study

de Alwis, Murphy, 2007

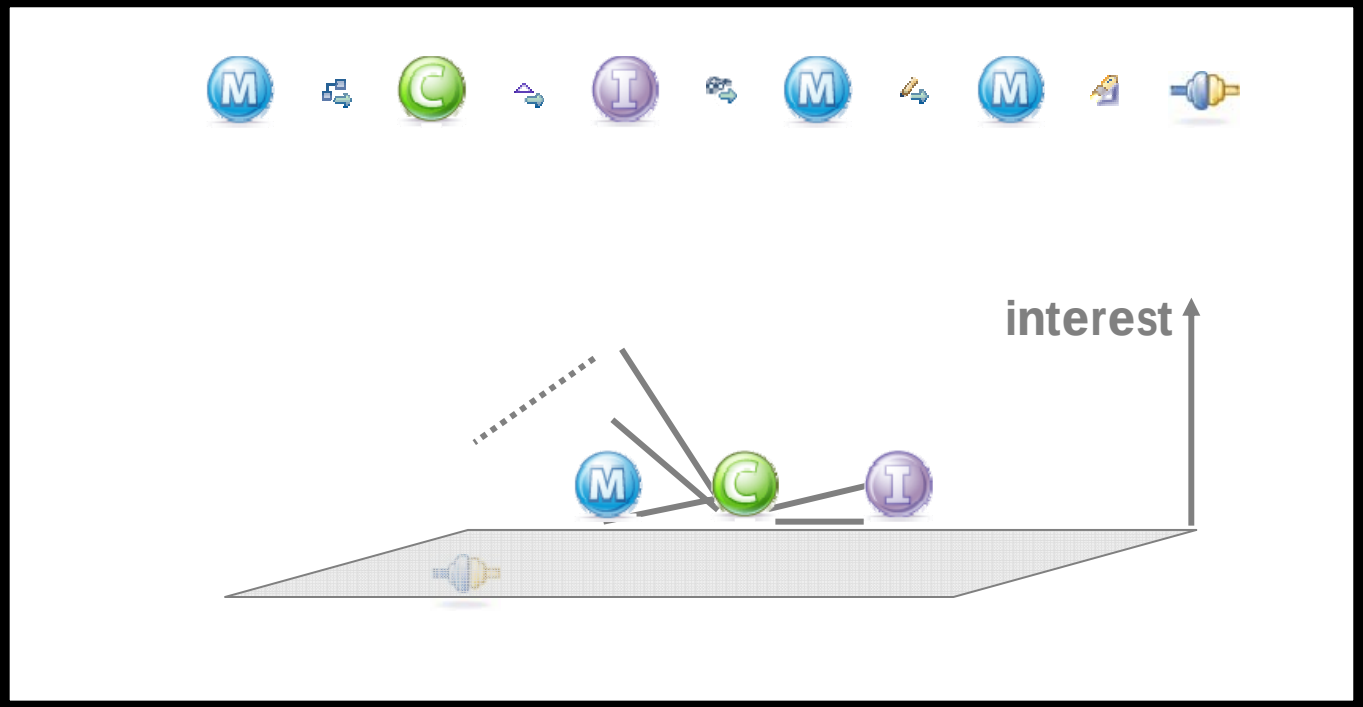
mismatch #2: information



Kersten, Murphy, 2007

mismatch #2: information

with Mylyn



Kersten, Murphy, 2007

mismatch #2: information

with Mylyn

click to play screencast (avi)
(demo portion unavailable on-line)

mismatch #2: information

with Mylyn

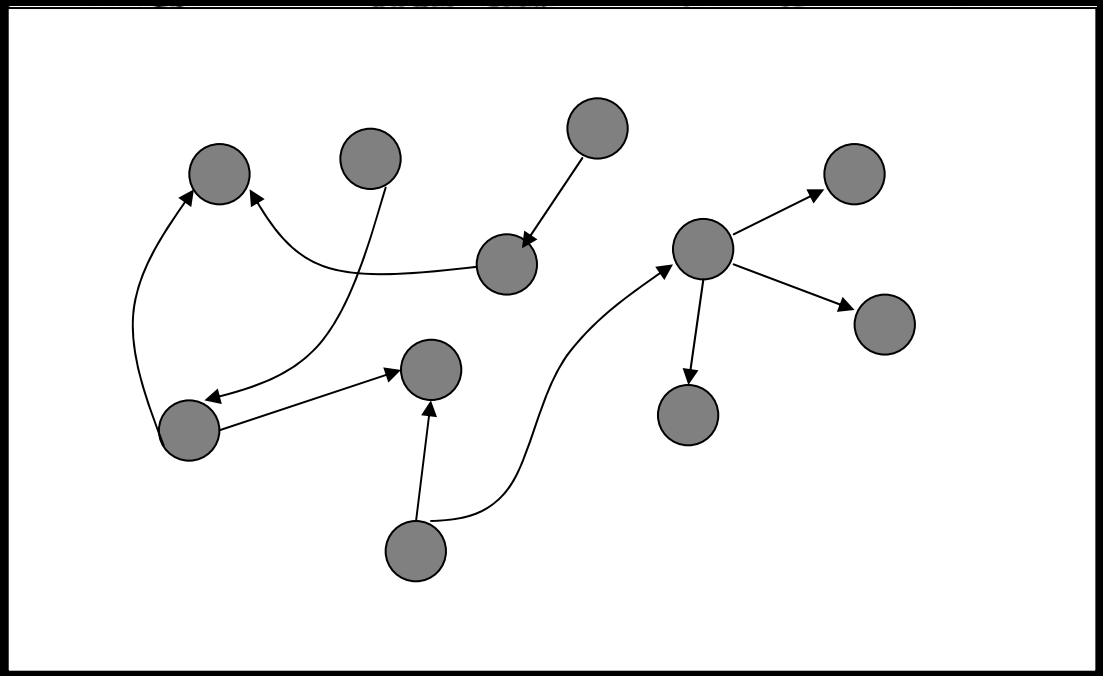
focus flow

based on a field study
and huge user community (1M+ downloads)

Kersten, Murphy, 2007

mismatch #3: strategies

currently



click to play screencast (avi)

mismatch #3: strategies

with web-style navigation

click to play demo (avi)

mismatch #3: strategies

with web-style navigation

demo unavailable on-line

Sherwood, Murphy, 2007

mismatch #3: strategies

with web-style navigation

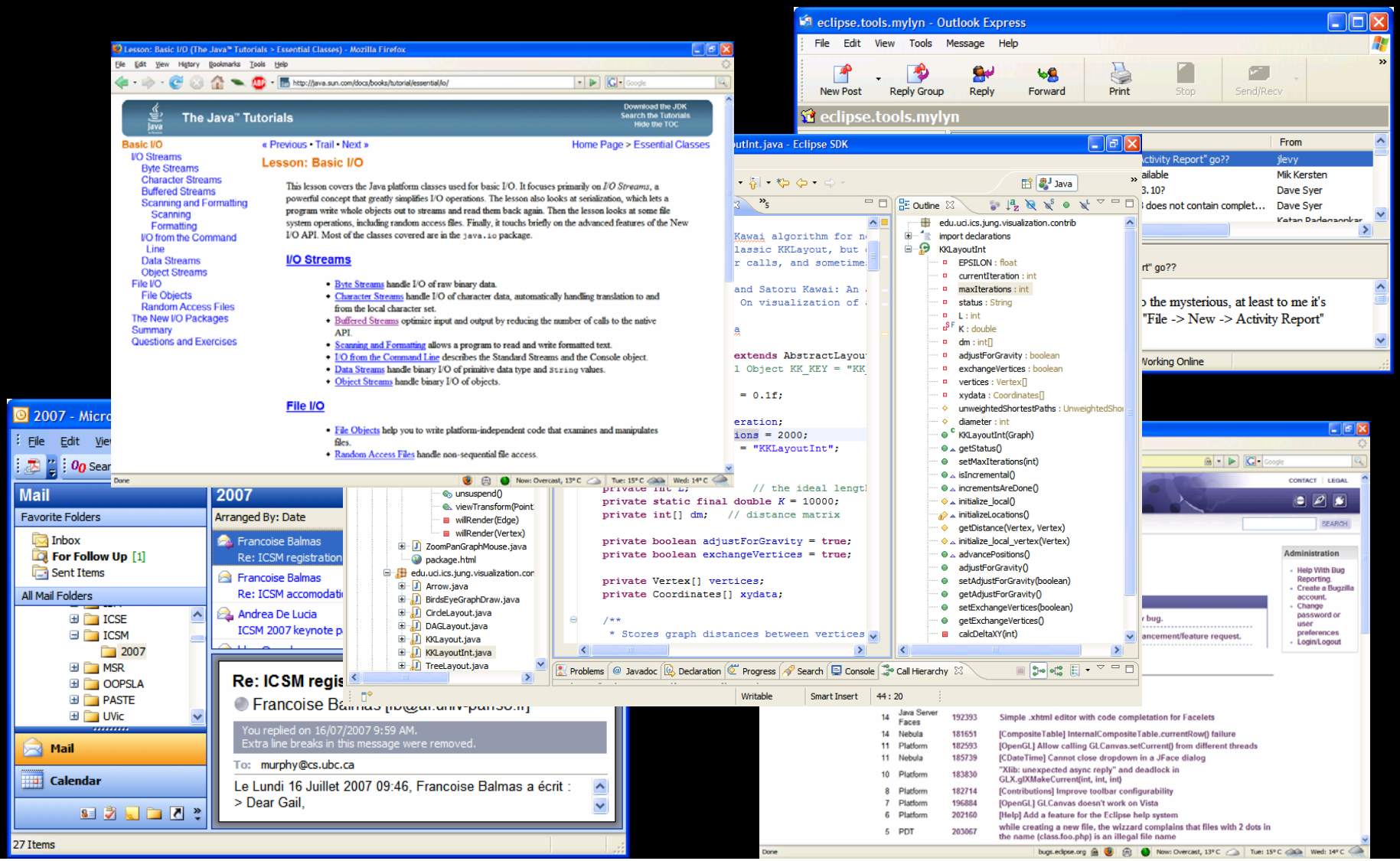
focus flow

tbd

a lurking problem

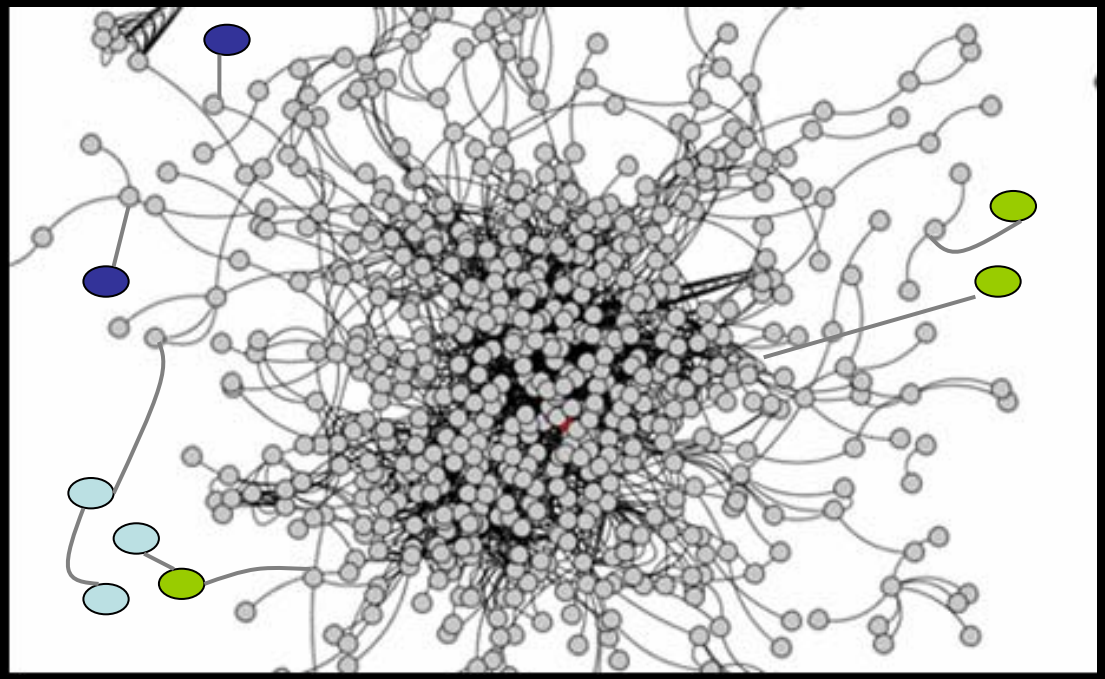
video used in talk unavailable on-line

a looming problem



a looming problem

more artifacts, looser structure



what to do?

1. enhance system structure model

2. rethink the model(s) behind the tools


















meghan allen
john anvik
elisa baniassad
wesley coelho
davor cubranic
brian de alwis
rob elves
thomas fritz
jan hannemann
lyndon hiew
reid holmes
mik kersten
seonah lee
shawn minto
martin robillard
izzet safer
david shepherd
ducky sherwood
annie ying
trevor young
robert walker
and others!

so…

information
information
information
information
information
information
Information
information

Cartoon not licensed for web version

mismatch

questions information strategies

cartoon not licensed for web version

{add, compute, present} information
with **focus** and **flow**

to manage information effectively