






Report on Identified Refactoring Opportunities for (SC/ST) Refactoring

The tool identifies the Control-Fields and conditional constructs (Switch/If) that use these Control-Fields to simulate the (SC / ST) refactoring. It prioritizes the Control-Fields (refactoring opportunities) based on the following criteria:

1. Number of conditional constructs that switch on Control-Field
Group i represents i different conditional constructs where the Control-Field is used
 2. Average size of the conditional body
 3. Number of control values
2-3 control values 
3-6 control values 
6-n control values 
 4. Presence of conditional constructs with respect to the class of declaration (COD) of Control-Field
In COD (A)
Outside (B)
Mixed (C)
 5. Qualified for SC or ST
 6. Static Field 
 7. Have subclasses already 
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Input Benchmark Statistics:

No. Of Classes: 510
No. Of Primitive Fields: 1258
No. Of Control-Fields for Subclass Pattern: 34
No. Of Control-Fields for State pattern: 66
Total No. Of Control-Fields: 100

Uses	Replace Type Code with Subclass (SC)		Uses	Replace Type Code with State (ST)	
8	<org.jfree.chart.renderer.category.StackedAreaRenderer, renderAsPercentages>	(A)	30	<org.jfree.chart.axis.ValueAxis, inverted>	(C)
6	<org.jfree.data.gantt.XYTaskDataset, transposed>	(A)	17	<org.jfree.chart.axis.ValueAxis, verticalTickLabels>	(B)
5	<org.jfree.data.xy.XYSeries, autoSort>	(C)	13	<org.jfree.chart.axis.ValueAxis, autoRange>	(C)
	<org.jfree.chart.axis.LogarithmicAxis, allowNegativesFlag>	(A)	12	<org.jfree.chart.axis.Axis, visible>	(B)
4	<org.jfree.data.general.SubSeriesDataset, parent>	(A)	10	<org.jfree.chart.renderer.category.BarRenderer, drawBarOutline>	(B)
	<org.jfree.chart.renderer.xy.XYDifferenceRenderer, roundXCoordinates>	(A)	8	<org.jfree.chart.axis.ValueAxis, autoTickUnitSelection>	(B)
	<org.jfree.data.general.CombinedDataset.DatasetInfo, data>	(B)	6	<org.jfree.chart.axis.Axis, tickLabelsVisible>	(B)
	<org.jfree.data.xy.XYSeries, allowDuplicateXValues>	(C)	5	<org.jfree.chart.axis.Axis, axisLineVisible>	(B)
	<org.jfree.chart.block.BlockParams, generateEntities>	(B)		<org.jfree.chart.renderer.category.BarRenderer, shadowsVisible>	(C)
	<org.jfree.chart.title.PaintScaleLegend, stripOutlineVisible>	(A)		<org.jfree.chart.ChartPanel, useBuffer>	(A)
3	<org.jfree.data.jdbc.JDBCCategoryDataset, transpose>	(A)		<org.jfree.chart.axis.Axis, tickMarksVisible>	(B)
	<org.jfree.chart.renderer.xy.StackedXYBarRenderer, renderAsPercentages>	(A)	4	<org.jfree.chart.renderer.category.LineAndShapeRenderer, useSeriesOffset>	(C)
				<org.jfree.chart.plot.PiePlot, simpleLabels>	(C)
				<org.jfree.chart.plot.ContourPlot, rangeCrosshairLockedOnData>	(A)
				<org.jfree.chart.title.TextTitle, expandToFitSpace>	(A)
				<org.jfree.chart.plot.dial.AbstractDialLayer, visible>	(B)
				<org.jfree.chart.axis.LogarithmicAxis, smallLogFlag>	(A)
			3	<org.jfree.chart.renderer.xy.CandlestickRenderer, useOutlinePaint>	(A)
				<org.jfree.chart.renderer.category.StackedBarRenderer, renderAsPercentages>	(A)
				<org.jfree.chart.renderer.xy.XYBarRenderer, shadowsVisible>	(C)
				<org.jfree.chart.plot.XYPlot, rangeCrosshairLockedOnData>	(C)
				<org.jfree.chart.renderer.xy.XYBarRenderer, drawBarOutline>	(C)
				<org.jfree.chart.plot.PiePlot, circular>	(C)
				<org.jfree.chart.axis.NumberAxis, autoRangeStickyZero>	(C)
				<org.jfree.chart.renderer.AbstractRenderer, dataBoundsIncludesVisibleSeriesOnly>	(B)

Uses	Replace Type Code with Subclass (SC)		Uses	Replace Type Code with State (ST)	
2	<org.jfree.chart.renderer.DefaultPolarItemRenderer, useFillPaint>	(A)	2	<org.jfree.chart.plot.XYPlot, domainCrosshairVisible>	(A)
	<org.jfree.chart.renderer.OutlierListCollection, lowFarOut>	(B)		<org.jfree.chart.renderer.category.LineAndShapeRenderer, useOutlinePaint>	(C)
	<org.jfree.chart.renderer.category.BoxAndWhiskerRenderer, fillBox>	(A)		<org.jfree.chart.renderer.category.BoxAndWhiskerRenderer, useOutlinePaintForWhiskers>	(A)
	<org.jfree.chart.renderer.xy.ClusteredXYBarRenderer, centerBarAtStartValue>	(A)		<org.jfree.chart.entity.ChartEntity, area>	(A)
	<org.jfree.chart.plot.CompassPlot, drawBorder>	(A)		<org.jfree.chart.plot.XYPlot, rangeCrosshairVisible>	(A)
	<org.jfree.data.xy.IntervalXYDelegate, autoWidth>	(A)		<org.jfree.chart.plot.CategoryPlot, rangeCrosshairVisible>	(A)
	<org.jfree.data.DefaultKeyedValues2D, sortRowKeys>	(A)		<org.jfree.chart.axis.DateAxis, timeline>	(A)
	<org.jfree.chart.plot.MeterPlot, drawBorder>	(A)		<org.jfree.chart.annotations.AbstractAnnotation, notify>	(A)
	<org.jfree.chart.renderer.OutlierListCollection, highFarOut>	(B)		<org.jfree.chart.plot.CategoryPlot, drawSharedDomainAxis>	(C)
	<org.jfree.chart.renderer.OutlierList, multiple>	(B)		<org.jfree.chart.block.AbstractBlock, frame>	(A)
	<org.jfree.data.time.Second, second>	(A)		<org.jfree.chart.plot.ContourPlot, domainCrosshairVisible>	(A)
	<org.jfree.chart.renderer.DefaultPolarItemRenderer, drawOutlineWhenFilled>	(A)		<org.jfree.chart.renderer.category.LineAndShapeRenderer, useFillPaint>	(C)
	<org.jfree.data.time.Millisecond, millisecond>	(A)		<org.jfree.chart.plot.ContourPlot, rangeCrosshairVisible>	(A)
	<org.jfree.chart.renderer.xy.XYBoxAndWhiskerRenderer, fillBox>	(A)		<org.jfree.chart.renderer.xy.XYItemRendererState, processVisibleItemsOnly>	(B)
	<org.jfree.chart.util.LogFormat, showBase>	(A)		<org.jfree.chart.renderer.xy.XYBarRenderer, useYInterval>	(C)
	<org.jfree.data.time.Minute, minute>	(A)		<org.jfree.chart.renderer.AbstractRenderer, autoPopulateSeriesStroke>	(C)
	<org.jfree.data.time.Hour, hour>	(A)		<org.jfree.chart.editor.DefaultNumberAxisEditor, autoRange>	(A)
	<org.jfree.chart.axis.LogarithmicAxis, expTickLabelsFlag>	(A)		<org.jfree.chart.renderer.AbstractRenderer, autoPopulateSeriesPaint>	(C)
	<org.jfree.chart.axis.SegmentedTimeline, adjustForDaylightSaving>	(A)		<org.jfree.chart.plot.CategoryPlot, rangeCrosshairLockedOnData>	(C)
	<org.jfree.chart.axis.LogarithmicAxis, log10TickLabelsFlag>	(A)		<org.jfree.chart.plot.Plot, outlineVisible>	(C)
	<org.jfree.chart.axis.PeriodAxis, minorTickMarksVisible>	(A)		<org.jfree.data.ComparableObjectSeries, allowDuplicateXValues>	(A)
	<org.jfree.chart.axis.DateTickUnit, unit>	(B)		<org.jfree.chart.annotations.XYTextAnnotation, outlineVisible>	(C)
				<org.jfree.chart.plot.PiePlot, sectionOutlinesVisible>	(C)
				<org.jfree.chart.renderer.category.BoxAndWhiskerRenderer, medianVisible>	(A)
				<org.jfree.chart.title.Title, visible>	(B)
				<org.jfree.chart.plot.ContourPlot, domainCrosshairLockedOnData>	(A)
				<org.jfree.chart.plot.ColorPalette, stepped>	(A)
				<org.jfree.chart.plot.Crosshair, visible>	(B)

Uses	Replace Type Code with State (ST)	
	<org.jfree.chart.ChartPanel, ownToolTipDelaysActive>	(A)
	<org.jfree.chart.plot.XYPlot, domainCrosshairLockedOnData>	(C)
	<org.jfree.chart.renderer.xy.XYAreaRenderer, showOutline>	(C)
	<org.jfree.chart.renderer.category.LineAndShapeRenderer, drawOutlines>	(C)
	<org.jfree.data.ComparableObjectSeries, autoSort>	(A)
	<org.jfree.chart.renderer.category.BoxAndWhiskerRenderer, meanVisible>	(A)
	<org.jfree.chart.axis.NumberAxis, autoRangeIncludesZero>	(C)
	<org.jfree.chart.renderer.xy.XYAreaRenderer, plotLines>	(C)
	<org.jfree.chart.renderer.xy.XYAreaRenderer, plotShapes>	(C)
	<org.jfree.chart.renderer.xy.CandlestickRenderer, drawVolume>	(A)
	<org.jfree.chart.plot.Crosshair, labelVisible>	(B)
	<org.jfree.chart.plot.PiePlot, labelLinksVisible>	(A)
	<org.jfree.chart.renderer.xy.XYAreaRenderer, plotArea>	(C)

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