DOCUMENTATION

Nr.:

Customer:

Project: Chart-Styles - XML-Definition
in the SCHMITZM Java library

Version: 2.3

Date: 03.11.2010

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I. Content

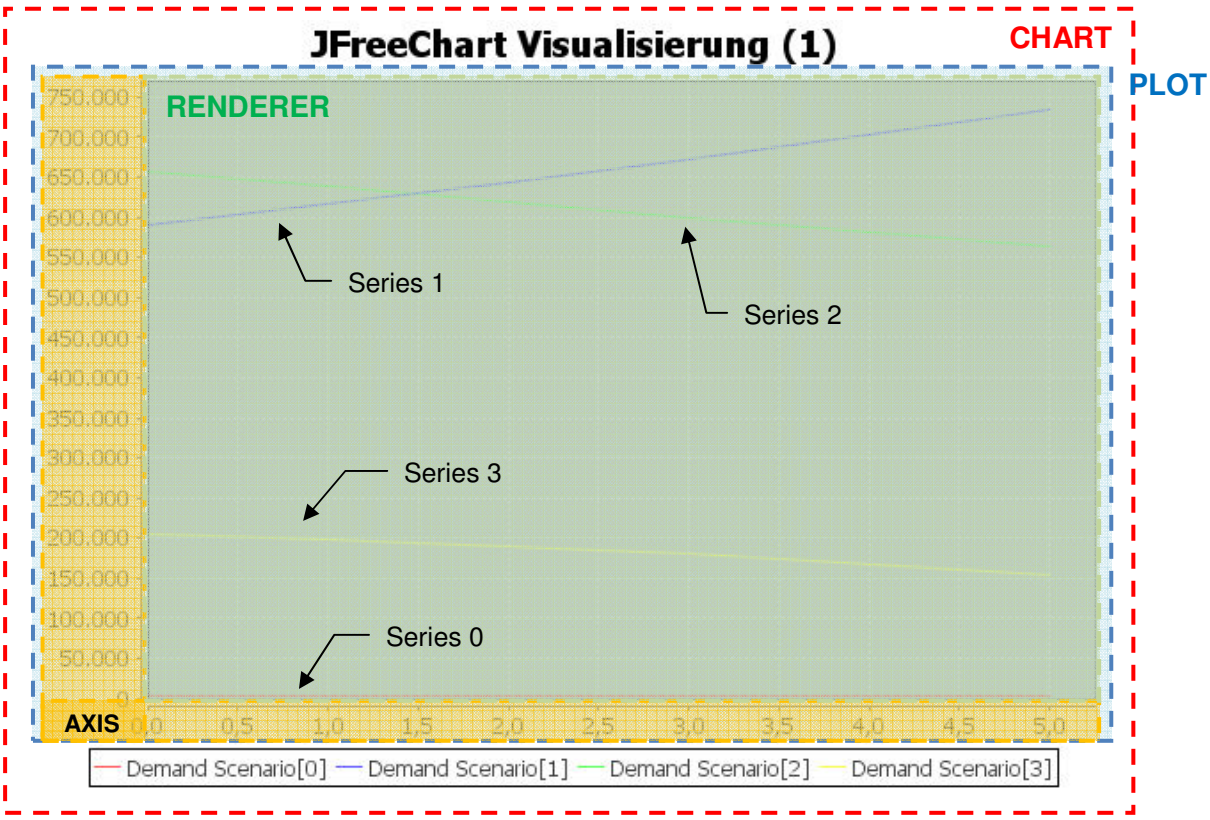
I. Content 2
II. Document version history 3
III. General terminology 4
IV. XML structure 5
V. Element / Attribute description 7
VI. Style objects 14
1. BasicChartStyle 14
2. ScatterChartStyle 14

II. Document version history

to version	date	Change
1.2	19.07.2009, Martin Schmitz	Axis title, title paint and title angle moved to an own element <title>.
1.3	31.07.2009, Martin Schmitz	Attribute “unit” for axis style. Variable count of range attributes (<rangeAttr2> eliminated). Attribute “normalize” for feature attributes. Attributes “sort” and “forceCategories” for feature domain attribute.
1.4	01.08.2009, Martin Schmitz	Attributes “legendVisible”, “legendLabel” and “legendTooltip” for <series> element of <renderer>
1.5	05.10.2009, Martin Schmitz	Element “crosshairLines” for <plot>
1.6	20.10.2009, Martin Schmitz	Attributes “centerAxisOrigin” for <plot>
1.7	22.02.2010, Martin Schmitz	Attribute “function” for <rangeAttr>
1.8	23.04.2010, Martin Schmitz	Element “seriesAttr” for <featureAttributes> NullAliases implemented in XML-Import/Export
1.8.1	05.05.2010, Martin Schmitz	Attribut “titleAttrName” for <seriesAttr>
1.9	12.05.2010, Martin Schmitz	Attribut “lineWidth” for <series> Attribut “seriesKey” for <series> <series>-properties also available for <renderer> to define defaults for series, which does not define the property explicity.
2.0	28.07.2010, Martin Schmitz	Attributes “lineDash” for <series> and <renderer> Attribute “axis” for <rangeAttr> Multiple Elements <renderer>
2.1	25.08.2010, Martin Schmitz	Attribute “ignoreNullRangeValues” for <tableAttributes>
2.2	26.08.2010, Martin Schmitz	Attribute “font” for axis title Attributes “paint” and “font” for axis values
2.3	02.11.2010, Martin Schmitz	Attribute “regrInfoVisible” for scatter charts

III. General terminology

Chart	The root panel is called chart. It contains the plot with the axis and the different graphs as well as the legend.
Plot	The plot contains the axis and graphs defined by the datasets.
Axis	The horizontal and vertical axis. Multiple axis are possible.
Dataset	The dataset contains the data. Multiple dataset for one plot are possible.
Series	A series is a part of the data, e.g. one row in a table, where every column defines a time step. In this case the series defines one line in the chart.
Renderer	The renderer defines the layout of one dataset (e.g. lines, points or areas). Additionally the renderer controls some properties about the dataset series (e.g. visibility or color). If the plot contains multiple datasets, also multiple renderers must be defined, e.g. to show one dataset as lines and another as points in the same chart.



IV. XML structure

```
<ChartStyle id="" type="…" orientation="…" legend="…" tooltips="…" urls="…"
                  stepped="…" stacked="…"
                  regrLineVisible="…" regrInfoVisible="…">
      <background paint="…"/>
      <border     visible="…"/>
      <title      paint="…">chart title</title>
      <desc       paint="…">chart sub-title </desc>
      <domainAxis visible="…" unit="…">
            <title paint="…" font="…" angle="…">axis title</title>
            <valueLabels paint="…" font="…" valueAngle="…" numberFormat="…" dateFormat="…"/>
      </domainAxis>
      <rangeAxis> ...</rangeAxis>
      <rangeAxis2>...</rangeAxis2>
      <renderer margin="…" selectionPaint="…"
                paint="…" lineWidth="…" lineDash="…" itemLabelsVisible="…" shapesVisible="…"
                legendVisible="…" legendLabel="…" legendTooltip="…">
            <series seriesKey="…" paint="…" lineWidth="…" lineDash="…" itemLabelsVisible="…"
                    shapesVisible="…" legendVisible="…" legendLabel="…" legendTooltip="…"/>
            ...
      </renderer>
      <renderer ...>
            <series .../>
            ...
      </renderer>
      <plot centerAxisOrigin="…">
            <foreground     alpha="…"/>
            <background     alpha="…"   paint="…"/>
            <insets         top="…"     bottom="…"   left="…"   right="…"/>
            <domainGridline visible="…" paint="…"/>
            <rangeGridline  visible="…" paint="…"/>
            <crosshairLines visible="…" paint="…"/>
      </plot>
      <tableAttributes ignoreNullRangeValues="…">
```

Legend	
black colored	available for all styles
red colored	only available for some styles; see chapter V for details
green colored / italic	individual text (e.g. title)
yellow background	not yet supported; further work!

```
            <domainAttr name="…" normalize="…" nullAliases="…" sort="…" forceCategories="…"/>
            <rangeAttr  name="…" normalize="…" nullAliases="…" axis="…"
                        function="…" weightAttrName="…" weightAttrNullAliases="…"/>
            <rangeAttr  name="…" normalize="…" nullAliases="…" axis="…"
                        function="…" weightAttrName="…" weightAttrNullAliases="…"/>
            ...
            <seriesAttr  name="…" nullAliases="…" titleAttrName="…"/>
      </tableAttributes>
</ChartStyle>
```

V. Element / Attribute description

Element	Description	Attribute	Description	Restrictions
`<ChartStyle>`	root element	`id`	(unique) identifier for the style	
		`type`	chart type: `bar, line, area, point, pie, gantt, timeseries, spider, scatter`	
		`orientation`	indicates the orientation the data is interpreted in: `horizontal | vertical`	only applicable for `XYPlot` and `CategoryPlot`
		`legend`	indicates whether a legend is generates in chart panel: `true | false`	
		`tooltips`	indicates whether tooltips are generates in chart panel: `true | false`	
		`urls`	indicates whether URLs are generates for chart panel: `true | false`	
		`stepped`	indicates whether line/area is stepped: `true | false`	only applicable for `BasicChartStyle` only applicable for `line` and `area` not applicable for bar (always `true`)
		`stacked`	indicates whether bars/areas are stacked: `true | false`	only applicable for `BasicChartStyle` only applicable for `bar` and `area`
		`regrLineVisible`	indicates whether a regression line is shown besides points: `true | false`	only applicable for `ScatterChartStyle`; if `true` a **second renderer** can be specified to style the regression line.

Element	Description	Attribute	Description	Restrictions
		`regrInfoVisible`	indicates whether textual regression information is shown in the plot: `true | false`	only applicable for `ScatterChartStyle`; only takes effect if `regrLineVisible` is also `true`.
`<background>`	defines the background format of the whole chart panel	`paint`	defines the background color: `RGB(<r>,<g>,<b>)` or Hex-Definition or `BLUE`, `RED`, `GREEN`, …	
`<border>`	defines the border format "around" the whole chart panel	`visible`	indicates a border is visible: `true | false`	
`<title>`	The element body defines the chart title. The `Translation` format can be used!	`paint`	defines the text color of the title: see `<background>`	
`<desc>`	The element body defines a detailed description for the chart[1]. The `Translation` format can be used!	`paint`	defines the text color of the description: see `<background>`	

`<domainAxis>`
`<rangeAxis>`
`<rangeAxis2>`
	The element body defines the axis title. The `Translation` format can be used!	`visible`	indicates whether the axis is visible:
			`true | false`	

		`unit`	defines an individual string which represents the unit for the axis values (e.g. used for tooltips)	

[1] not yet shown in the chart directly; maybe in extra tooltip

Element	Description	Attribute	Description	Restrictions
<title> as child of <domainAxis> <rangeAxis> <rangeAxis2>	The element body defines the axis title. The Translation format can be used!	paint	defines the text color of the axis title: see <background>	
		font	defines the text font of the axis title, Format: <FontName>-<Style>-<Size>	see Font.decode(.) for details about the format
		angle	indicates the angle the axis title is rotated with: 0 … 360 (degrees)	
<valueLabels>	Defines the format of the axis values.	paint	defines the text color of the axis values: see <background>	
		font	defines the font of the axis values: <FontName>-<Style>-<Size>	see Font.decode(.) for details about the format
		valuesAngle	indicates the angle the axis values rare rotated with: 0 … 360 (degrees)	for NumberAxis and DateAxis only the values 0 and 90 are allowed
		numberFormat	Number format for the axis values: see java.text.DecimalFormat	only applicable for DateAxis (e.g. not for CategoryAxis)
		dateFormat	Date format for the axis values: see java.text.DateFormat	only applicable for DateAxis (e.g. not for CategoryAxis)
<renderer>	Defines the style for each of the chart's graphs. Multiple <renderer>	margin	Defines the margin (in percentage) between the bars: 0.0 … 1.0 (percentage)	only applicable for XYBarRenderer

Element	Description	Attribute	Description	Restrictions

	elements are possible, but the order of the elements is important!!	`paint`
		`lineWidth`
		`lineDash`
		`itemLabelsVisible`
		`shapesVisible`
		`legendVisible`
		`legendLabel`
		`legendTooltip`
			These parameters are used as default for all series which does not define the parameter explicitly for their own.
			
			see `<series>` for details	

`<series>`	Defines the style for each series in the dataset. Multiple `<series>` elements are possible, but the order of the elements is important!!	`seriesKey`	Defines the series key the style is defined for	In some cases the series indices are unknown, but the series keys. only applicable when using CategoryDataset
		`paint`	Defines the color for the graph: see `<background>`	
		`lineWidth`	Defines the line width for the graph in pixels.	
		`lineDash`	Semicolon-seperated list of floats, which define the dash attributes (see BasicStroke for details)	
		`itemLabelsVisible`	Indicates whether a value label is visible for each note: `true | false`	
		`shapesVisible`	indicates whether a (default) shape is shown for each note: `true | false`	not useful for point charts!
		`legendVisible`	indicates whether a legend entry for the series is shown in the legend: `true | false`	

Element	Description	Attribute	Description	Restrictions
		legendLabel	defines label shown for the series in the legend	
		legendTooltip	defines tooltip shown for the series in the legend	
<plot>	Defines the style for the plot.	centerAxisOrigin	indicates whether the axis origin (0/0) is centered in the plot: true | false	
<foreground>	Defines the foreground of the plot.	alpha	defines the transparency: 0.0 … 1.0 (percentage)	
<background>	Defines the background of the plot.	alpha	defines the transparency: 0.0 … 1.0 (percentage)	
		paint	defines the background color of the plot: see <background>	
<insets>	Defines the border margins of the plot to the rest of the chart (e.g. legend and title)	bottom	bottom margin in pixels	
		top	top margin in pixels	
		left	left margin in pixels	
		right	right margin in pixels	
<domainGridLine> <rangeGridLine>	Defines the horizontal / vertical grid lines	visible	indicates whether grid lines are displayed: true | false	
		paint	defines the color the grid lines are displayed in: see <background>	
<crosshairLines>	Defines the crossair lines (around 0/0)	visible	indicates whether crosshair lines are displayed: true | false	
		paint	defines the color the crosshair lines are displayed in: see <background>	

Element	Description	Attribute	Description	Restrictions
`<tableAttributes>`	Defines table attributes (e.g. feature attributes) used to generate the data from.	`ignoreNullRangeValues`	indicates whether NoData values on the range axes are ignored when creating the dataset(s): `true | false`	When `false`, the NoData values are treat as numeric 0, which can be result in poor peeks (e.g. in line charts). For bar charts it can be useful to deal with NULLs as 0.
`<domainAttr>`	Attribute defining the data along the domain axis (X).	`name`	defines the attribute name	
		`normalize`	indicates whether the values are normalized before inserted into chart dataset: `true | false`	only applicable for numeric attributes
		`sort`	indicates whether the table rows (e.g. features) are sorted according to the domain attribute before inserting into chart dataset: `true | false`	
		`forceCategories`	indicates whether a `CategoryDataset` is forced also for a numeric domain attribute: `true | false`	if domain attribute is not numeric always a `CategoryDataset` is used
		`nullAliases`	Semicolon-separated list of attribute values, which are interpreted as NULL	
`<rangeAttr>`	Attribute(s) defining the data along the range axis (Y). For each range attribute a series is created.	`name`	defines the attribute name	`ScatterChartStyle` only supports exactly one range attribute. For pie charts the range attributes are completely ignored.
		`normalize`	indicates whether the values are normalized before inserted into chart dataset: `true | false`	

Element	Description	Attribute	Description	Restrictions
		axis	defines the axis, the attribute deals with: 1 = primatry range axis (default) 2 = secondary range axis	
		function	specifies a function, which is applied to all values of one category: COUNT | SUM | SUM_ABS | AVG | MEDIAN | MIN | MAX | VARIANCE | STND_DEV | PERC	
		nullAliases	see <domainAttr>	
<seriesAttr>	Optional: Attribute defining the value used to identify a group. For each group a series is created. Only one series attribute allowed.	name	defines the attribute name	Currently <seriesAttr> is only available for CategoryDatasets.
		nullAliases	see <domainAttr>	
		titleAttrName	defines the attribute where the series title is automatically taken from (on creating the dataset); the attribute legendLabel of the <series> is ignored if titleAttrName is used	

VI. Style objects

1. BasicChartStyle

This style can be used to style basic charts:

- line
- area
- bar

Only one Y-Axis is provided.

2. ScatterChartStyle

This style can be used to style a point chart. Only one dataset and one series is provided.
Optionally a second dataset for a regression line is generated automatically.