

# Cheat sheet: Data visualization with KNIME Analytics Platform

## Univariate

### General visualizations

Pie Chart	Pie Chart: Visualizes categorical data using circular charts with slices representing categories and sizes indicating proportions.
Bar Chart	Bar Chart: Generates graphical representations of categorical data using rectangular bars, providing insights into category frequency or distribution.
Line Plot	Line Plot: Creates line charts to visualize trends, patterns, or correlations between two numeric variables.
Heatmap	Heatmap: Visualizes tabular data using a color-coded matrix, revealing patterns and correlations.
Stacked Area Chart	Stacked Area Chart: Displays cumulative contributions of categories or variables, illustrating trends and relative proportions.
Density Plot	Density Plot: Visualizes numeric variable distributions as smooth curves, facilitating comparisons.
Sunburst Chart	Sunburst Chart: Creates hierarchical visualization representing structure and composition of categorical or hierarchical data.
Hierarchical Cluster View	Hierarchical Cluster View: Visualizes hierarchical clustering results.
Radar Plot Appender	Radar Plot Appender: Appends radar plot attributes to data based on user-defined rules or mappings. Enables multivariate visualization and comparison.
Parallel Coordinates Plot	Parallel Coordinates Plot: Visualizes high-dimensional data with polylines connecting points along different axes. Useful for multivariate analysis and pattern identification.

## Multivariate

### Geospatial visualizations

Geospatial View	Geospatial View: Visualizes and explores geospatial data on interactive maps.
Choropleth Map	Choropleth Map: Generates thematic maps by coloring regions based on a specific variable.
Kepler.gl Geoview	Kepler.gl Geoview: Visualizes an interactive mapping interface for exploring and visualizing geographic data in various formats.
Spatial Heatmap	Spatial Heatmap: Visualizes geospatial data on an interactive heatmap, using a weight column to represent the intensity at each element. This node also allows to customize the color, adjust the intensity, and change the base map.

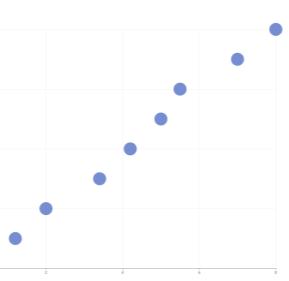
### Model scoring

ROC Curve	ROC Curve: Evaluates and visualizes performance of binary classification models using the Receiver Operating Characteristic (ROC) curve.
Binary Classification Inspector	Binary Classification Inspector: Outputs a view made of four different charts to compare, optimize, and select predictions of different binary classifiers. The view consists of the model's Statistics bar chart, the model's ROC Curve, and each model's Confusion Matrix and Classification Distribution.
Lift Chart (JavaScript)	Lift Chart (JavaScript): Creates a Lift chart that graphically represents the performance of a model compared against a random guess. The higher the difference between the lift line and the base line, the better the model's performance.
Scorer (JavaScript)	Scorer (JavaScript): Compares two columns by their attribute value pairs and outputs a confusion matrix indicating a classification model's performance.

## Comparison



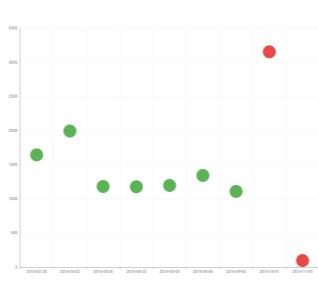
## Correlation



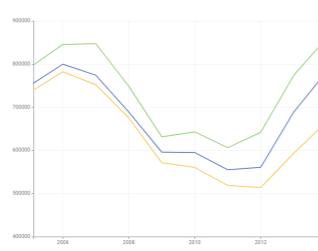
## Distribution



## Outliers



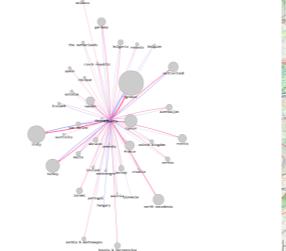
## Time



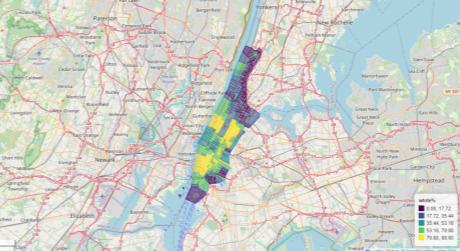
## Text



## Networks



## Geography



## Widgets

Widget nodes provide input parameters for other nodes in the workflow and are shown as widgets in component composite views. Using such nodes enables interaction with the data by selecting, filtering and entering values, and applying the new settings in both KNIME Analytics Platform and when deploying the workflow as a Data App on the KNIME Business Hub.

**String Widget:** Creates a text input widget that outputs a String flow variable with a given value, which will be available for downstream nodes. Equivalent nodes exist for the creation of Integer, Double, Boolean, or Date&Time values.

**Single Selection Widget:** Allows selecting a single value from a list of Strings, the selected value is returned as a String flow variable. An equivalent node exists for selecting multiple values (Multiple Selection Widget node).

**Nominal Row Filter Widget:** Creates a value filter widget that allows to interactively filter a data table in an Interactive View. The node takes a data table as input and outputs the filtered data table.

**List Box Widget:** Creates a text area input widget. The node outputs a data table with one column holding a list of Strings.

**Refresh Button Widget:** Adds a button widget to an Interactive View which triggers the re-execution of downstream nodes and by that allows to refresh the view. The button text is configurable.

**Column Selection Widget:** Creates a column selection widget that allows to interactively filter a data table in an Interactive View. Similar to the Nominal Row Filter Widget node, this node takes the data table as input and outputs the filtered data table.

**Column Filter Widget:** Creates a column filter widget that allows to interactively filter a data table in an Interactive View. Similar to the Nominal Row Filter Widget node, this node takes the data table as input and outputs the filtered data table.

**Autocomplete Text Widget:** Creates a text field input widget that supports autocomplete when entering text. The possible values are taken from a selected column in the input table.

## Utilities

**Number Format Manager:** Defines and manages custom number formats for data visualization, ensuring consistent and meaningful representation of numerical values.

**String Format Manager:** Defines and manages custom string formats for data visualization, ensuring consistent and meaningful representation of a sequence of characters.

**Color Manager:** Defines and manages custom color schemes for data visualization, enhancing interpretability and aesthetics.

**Extract Color:** Extracts color information (e.g., RGB, hexadecimal values) from data for color-based analysis and visualization.

**Renderer to Image:** Converts a KNIME View or visualization to an image.

**Report PDF Writer:** Writes a given report to a PDF file at the specified location.

**Report HTML Writer:** Writes a given report to an HTML file at the specified location.

**Report Template Creator:** Defines the basic layout of a report such as page layout and orientation. The template can then be passed to a component downstream, which will fill the report.

**Text View:** Displays text output provided by a user. Useful to create text or number infographics in Interactive Views or Data Apps.

## Time series visualizations

Animated Bar Chart	Animated Bar Chart: Creates dynamic bar chart visualizations to show changes in numeric values over time or a specific dimension.
Autocorrelation Plot	Autocorrelation Plot: Analyzes seasonal patterns in time series data.

## Other visualizations

Table View	Table View: Allows viewing and inspecting data in a tabular format, facilitating exploration, sorting, and filtering.
Tile View (JavaScript)	Tile View (JavaScript): Displays tabular data in a grid layout, allowing for easy comparison and exploration of multiple data elements.

## Components & composite views

A **component** is a KNIME node that contains a KNIME workflow, which lets you bundle functionality for sharing and reusing, can have its own configuration dialog, and can have its own sophisticated interactive view.

Such interactive view is also called the **component composite view** and can combine multiple views and represent a web page in a data app. Components that contain at least one widget or view node will have a composite view.

To **create a component**, select all relevant nodes, right-click and select **Create component**. Right-clicking a component opens the context menu with a number of options such as **expand** or **configure**. To add input or output ports to a component, click the plus on the left side for additional input ports, and the plus on the right for additional output ports.

To customize the **component composite view**, use the **layout editor**. Right-click the component and select **Component > Open layout editor**.

## Text visualizations

Tag Cloud	Tag Cloud: Visualizes word frequency or importance in a word cloud format for text data.
Document Viewer	Document Viewer: Allows to view and search a list of documents. A double click on a document shows all the document's information, such as title, full text, author names, publication date, etc.
Tagged Document Viewer	Tagged Document Viewer: Useful for visualizing tagged terms of a document. Each term will be highlighted and its corresponding tags will be displayed above it.

## Code-based visualizations

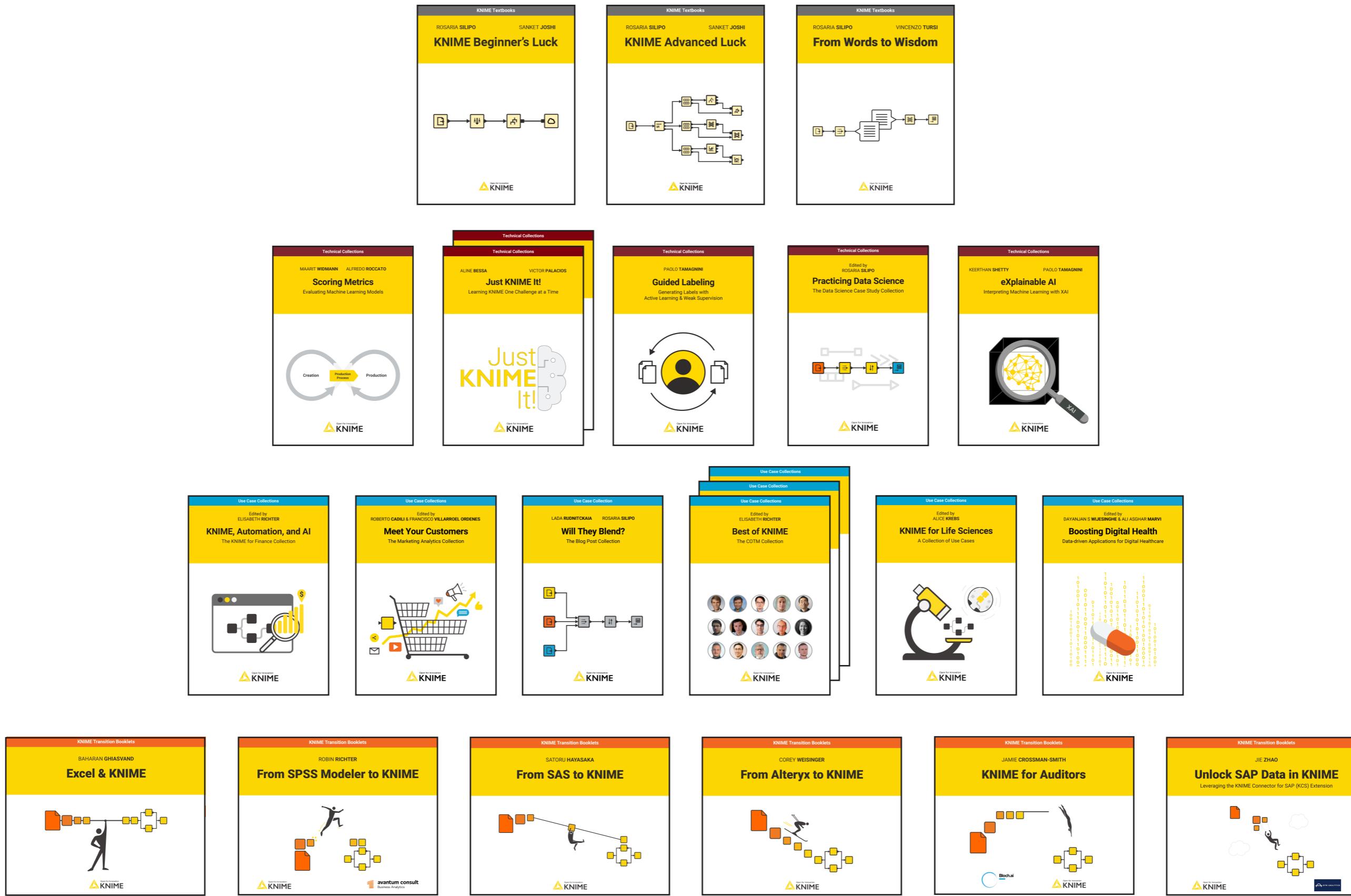
Python View	Python View: Incorporates custom Python code within a KNIME workflow, leveraging Python libraries. The code editor also provides access to AI assisted code generation if the KNIME AI Assistant (Labs) extension is installed.
Generic ECharts View	Generic ECharts View: Allows creating custom views using Apache ECharts and JavaScript. The code editor also provides access to AI assisted code generation if the KNIME AI Assistant (Labs) extension is installed.
R View (Table)	R View (Table): Integrates custom R scripts or code within KNIME workflow, leveraging R's visualization libraries.
Generic JavaScript View	Generic JavaScript View: Executes custom JavaScript code within a KNIME workflow, enabling the use of a set of predefined JavaScript libraries to generate the view.

## Resources

- KNIME Press:** Access various data science books and other cheat sheets at [knime.com/knimepress](http://knime.com/knimepress), including beginner and advanced topics.
- KNIME blog:** Engaging topics, challenges, industry news, & knowledge nuggets at [knime.com/blog](http://knime.com/blog).
- Self-paced courses:** Take our free online self-paced courses to learn about data analysis, data engineering, or data science with KNIME (with hands-on exercises) at [knime.com/learning](http://knime.com/learning).
- KNIME Community Hub:** Store, version, automate, and collaborate on private workflows, or explore and share public workflows with the KNIME Community at [hub.knime.com](http://hub.knime.com).
- KNIME Forum:** Join our global community & engage in conversations at [forum.knime.com](http://forum.knime.com).
- KNIME Business Hub:** For team-based collaboration, automation, management, & deployment check out KNIME Business Hub at [knime.com/knime-business-hub](http://knime.com/knime-business-hub).

## KNIME Press

Extend your KNIME knowledge with our collection of books from KNIME Press. For beginner and advanced users, through to those interested in specialty topics such as topic detection, data blending, and classic solutions to common use cases using KNIME Analytics Platform - there's something for everyone. Available for download at [www.knime.com/knimepress](http://www.knime.com/knimepress).



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