



Welcome to KNIME Pros Learnathon

Building Reliable and Reusable Components

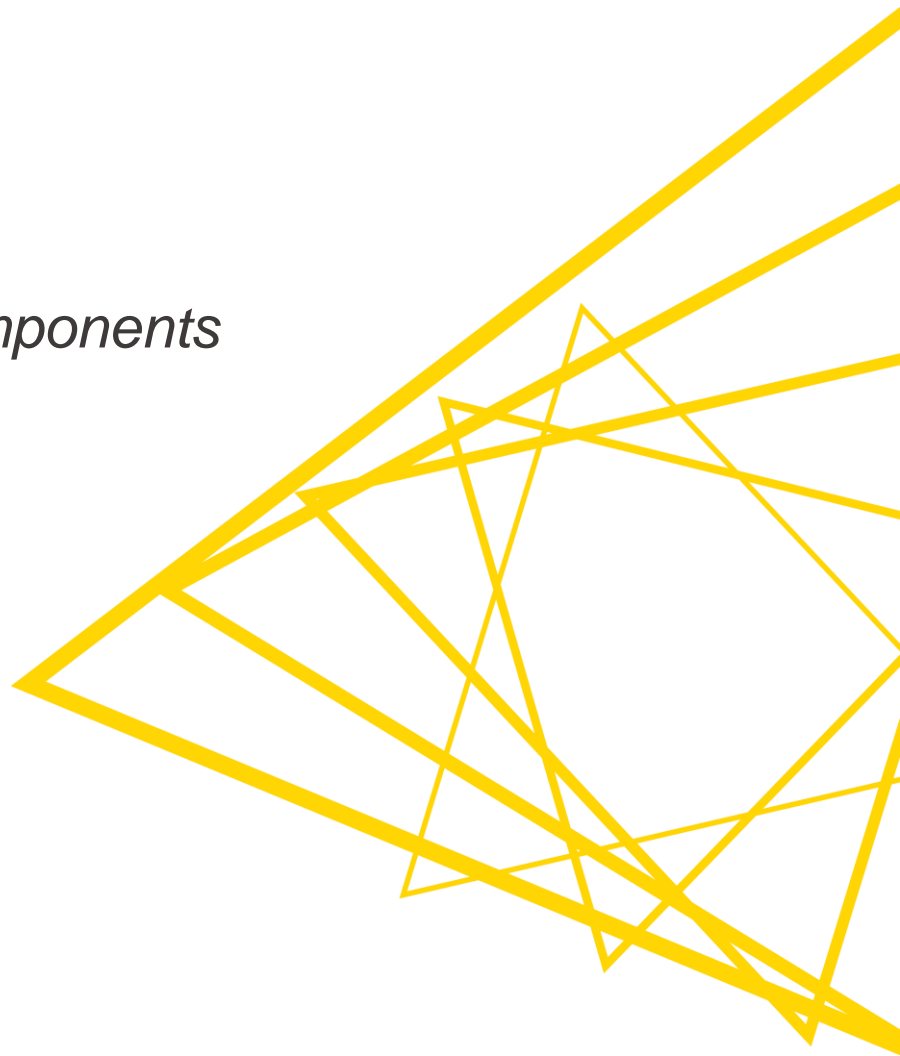
Going live at:

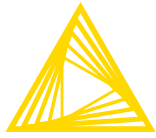
Chicago 10:00 am

San Francisco 8:00 am

New York 11:00 am

Berlin 5:00 pm





Open for Innovation

KNIME

KNIME Pros Learnathon

Building Reliable and Reusable Components

Paolo Tamagnini and Team:

paolo.tamagnini@knime.com

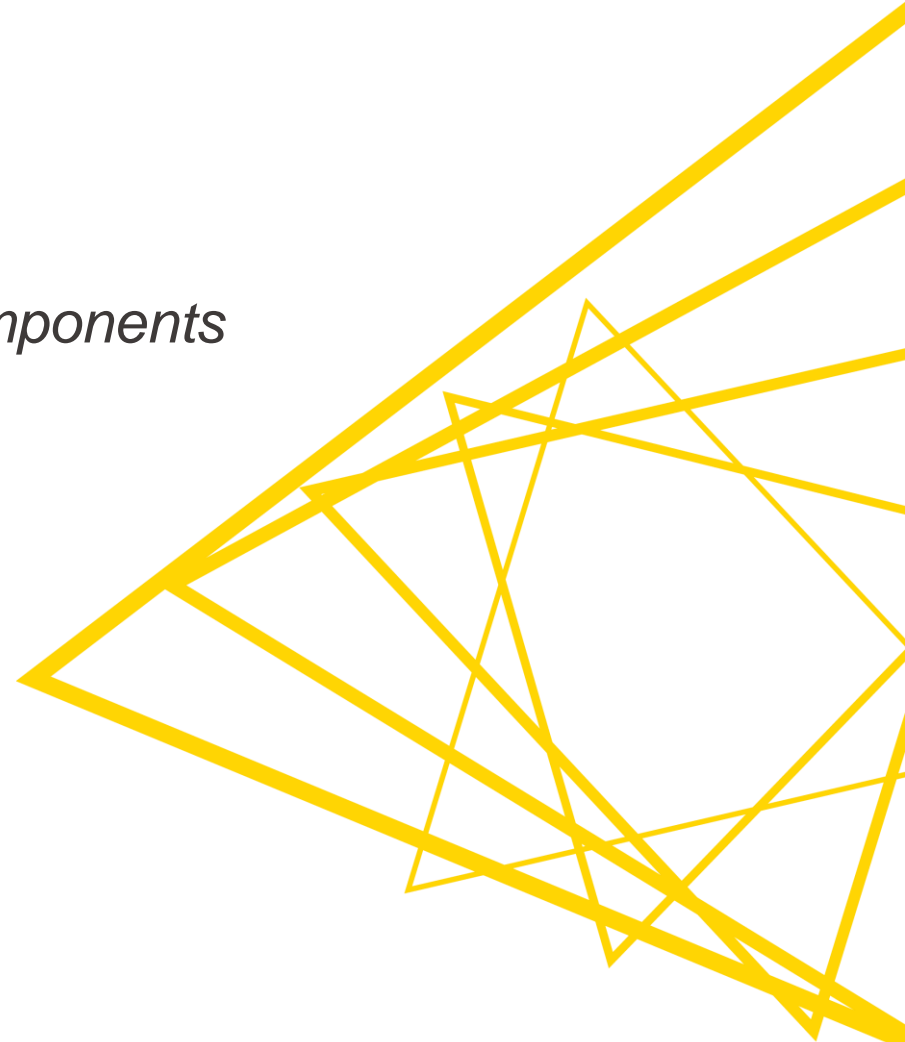


@KNIME

#Learnathon

Slides Download:

tinyurl.com/KNIME-Pros-Stuff



KNIME Analytics Platform - Demo

KNIME Explorer

Overview of the available workflows.

Workflow Coach

Lists node recommendations based on the workflows built by the wide community of KNIME users.

Node Repository

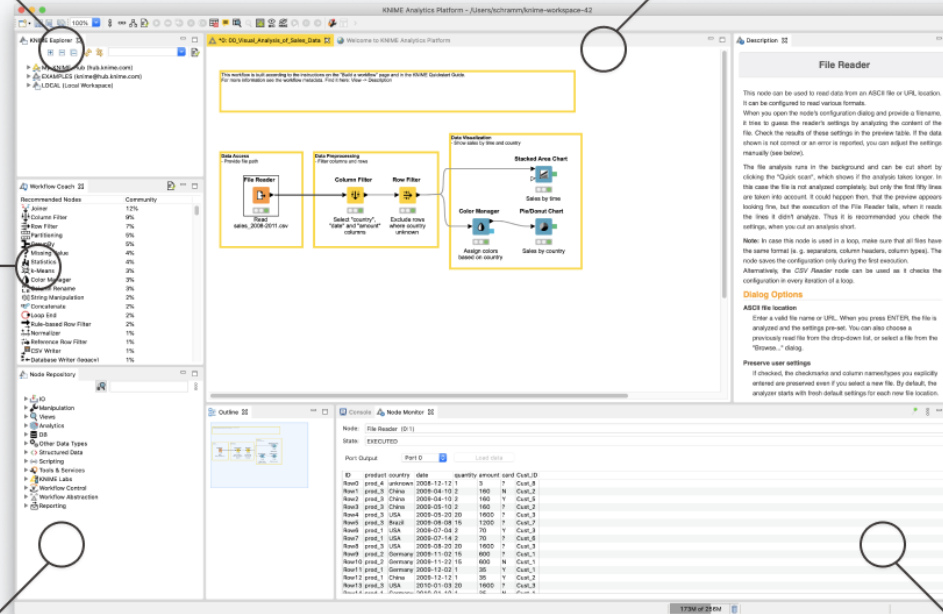
All available nodes in KNIME Analytics Platform to build your workflows.

Workflow Editor

Canvas for editing the currently active workflow.

Node Monitor

Shows the current flow variable values or a preview of the output data of the selected node.



KNIME Verified Components


The diagram illustrates the Orange3 software interface, which is designed for data analysis and machine learning. It features a central workspace where users can drag and drop various data processing and analysis widgets. The widgets are organized into several categories, each represented by a colored box on the left side of the interface:

- Text Processing:** Includes widgets like Document Pre-processing, Document Similarity Learner, Document Similarity Predictor, and PubMed Document Extractor.
- Data Manipulation:** Includes widgets like Interactive Data Cleaning, Column Name Editor, Column Filter (by Index), and Quantile Normalization.
- Model Interpretability:** Includes widgets like K-means LIME, Compute LIME, SHAP Summarizer, Partial Dependence Pre-processing, and Classification Threshold Analysis.
- Guided Analytics:** Includes widgets like Parameter Optimization, Dimensionality Reduction (LDA), Optimized K-Means (Silhouette Coefficient), Analyze Workflow Summary, Embed Data Into Workflow, and Dimensionality Reduction (LDA).
- Automation:** Includes widgets like Molecular Properties Filter, PDB Data Extractor, ChEMBL Bioactivities, Download FASTQ files from ENA, ChEMBL Structure Search, PDB Chemical Structure Search, Pathway Enrichment Analysis, ChEMBL Lookup, and ChEMBL Details.
- Life Sciences:** Includes widgets like ARR and MRR by Time-based Cohort, Asset prices to one-period (log) returns, Calculate Recurring Values, One-period returns to multi-period returns, One-period log returns to multi-period log returns, Customer Count and Churn Rate by Time-based Cohort, Sequence Logo, Hierarchical Clustering and Heatmap, and Choropleth World Map.
- Financial Analysis:** Includes widgets like Discrete Wavelet Transform (DWT), Fast Fourier Transform (FFT), Remove Seasonality, ARIMA Learner, Analyze ARIMA Residuals, ARIMA Predictor, Decompose Signal, Return Seasonality, Auto ARIMA Learner, Spark Lag Column, Timestamp Alignment, Aggregation Granularity, and Inspect Seasonality.
- Visualizations:** Includes widgets like Document Pre-processing, Document Similarity Learner, Document Similarity Predictor, and PubMed Document Extractor.
- Time Series:** Includes widgets like Document Pre-processing, Document Similarity Learner, Document Similarity Predictor, and PubMed Document Extractor.

The central workspace shows a workflow where data is loaded from a file, pre-processed, and then analyzed using various machine learning models and visualization tools. The workflow is represented by a series of connected widgets, each with a unique icon and label.

KNIME Verified Component Team



Jeany 

KNIME Team Member



temesgen-dadi

KNIME Team Member

Berlin, Germany



Maarit

KNIME Team Member



Mpattadkal

KNIME Team Member



Francosinus

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Martyna 

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Corey

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ana_ved

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Konstanz, Germany



Alice_Krebs

KNIME Team Member



Lada

KNIME Team Member

and more..

KNIME Features for Components

- **Configuration:** Configuration nodes and Component Dialogue
- **Simple Workflow Control:** Flow Variables, Switch and Breakpoint nodes
- **Advanced Workflow Control:** Try / Catch, Loop and Capture Workflow nodes
- **Composite Views:** Widget and View nodes, Layout panel, Nested Components
- **Documentation:** Component Appearance and Metadata
- **Sharing:** Components to and from KNIME Hub

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Component Configuration

- **Configuration nodes**

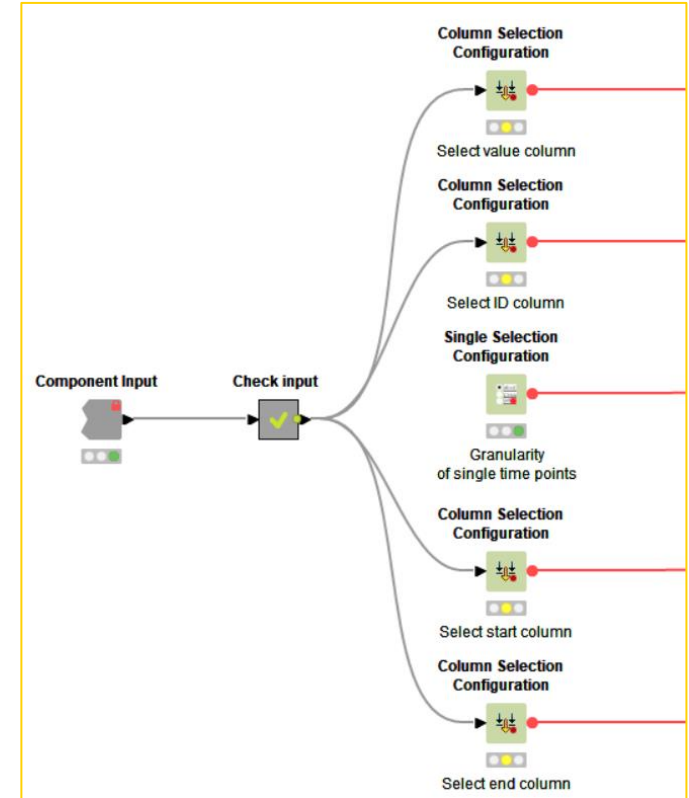
- control the execution of any workflow.
- most often output Flow Variables (red connections) to change other nodes settings.

Inside a Component they build the Component dialogue.

- **Component dialogue**

All configuration nodes inside a Component display in its dialogue window (double-click on the Component).

This enables anyone to control the execution of the workflow without even inspecting it.



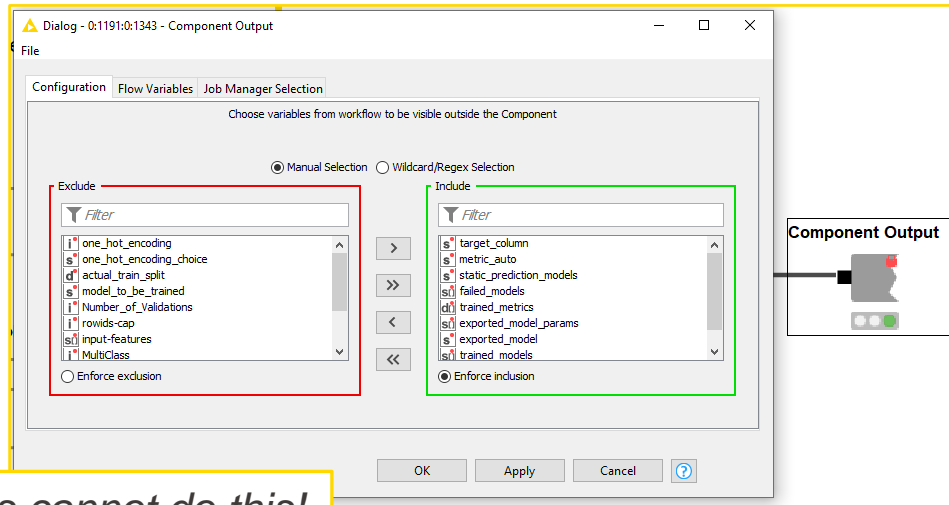
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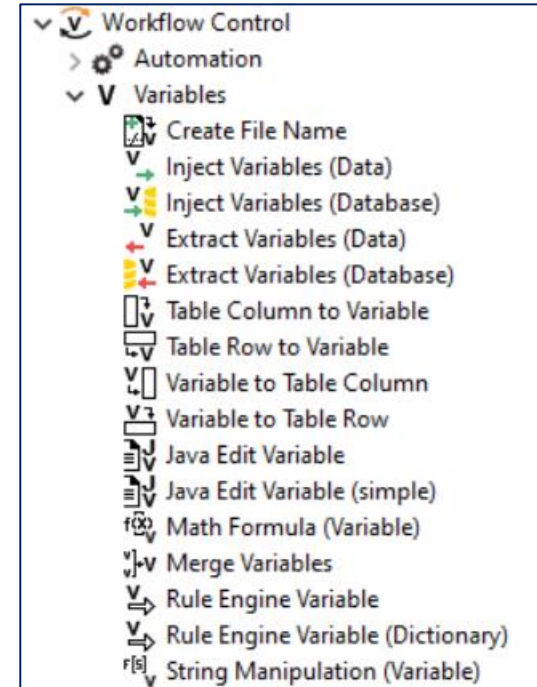
Simple Workflow Control inside Component

- **Flow Variables**

- are usually created by Configuration nodes
- Nodes are available to edit them as necessary
- should be used to dynamically change settings of any node
- can be confined within the component or exported



Metanodes cannot do this!



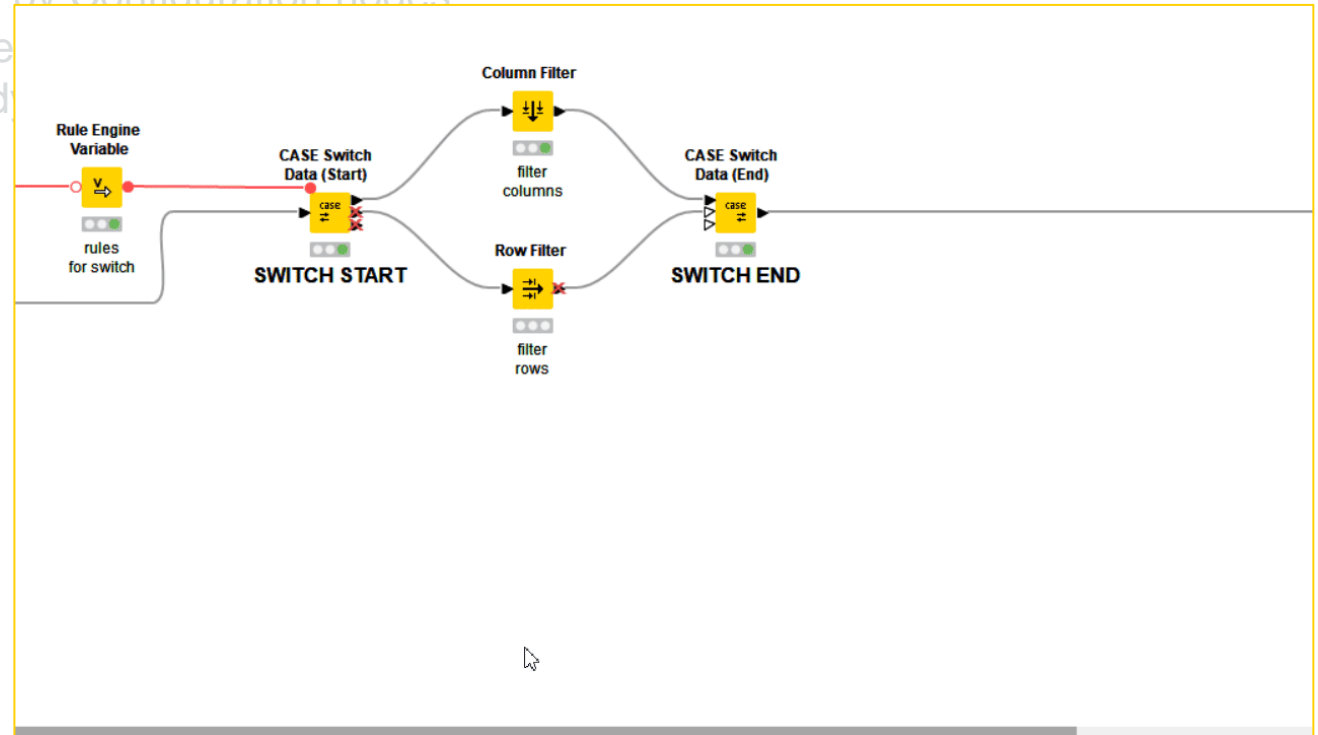
Simple Workflow Control inside Component

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- should be used to d

- **Switch nodes**

- control which workflow branch is executed via a flow variable.



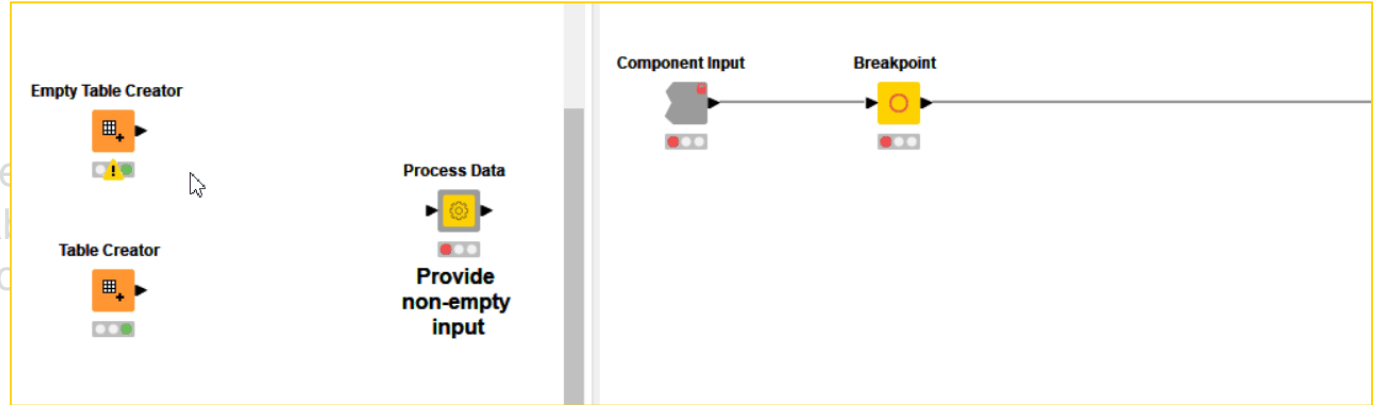
Simple Workflow Control inside Component

- **Flow Variables**

- are usually created
- Nodes are available
- should be used to

- **Switch nodes**

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- **Breakpoint node**

- makes the component fail if condition is met.
- returns custom error messages.

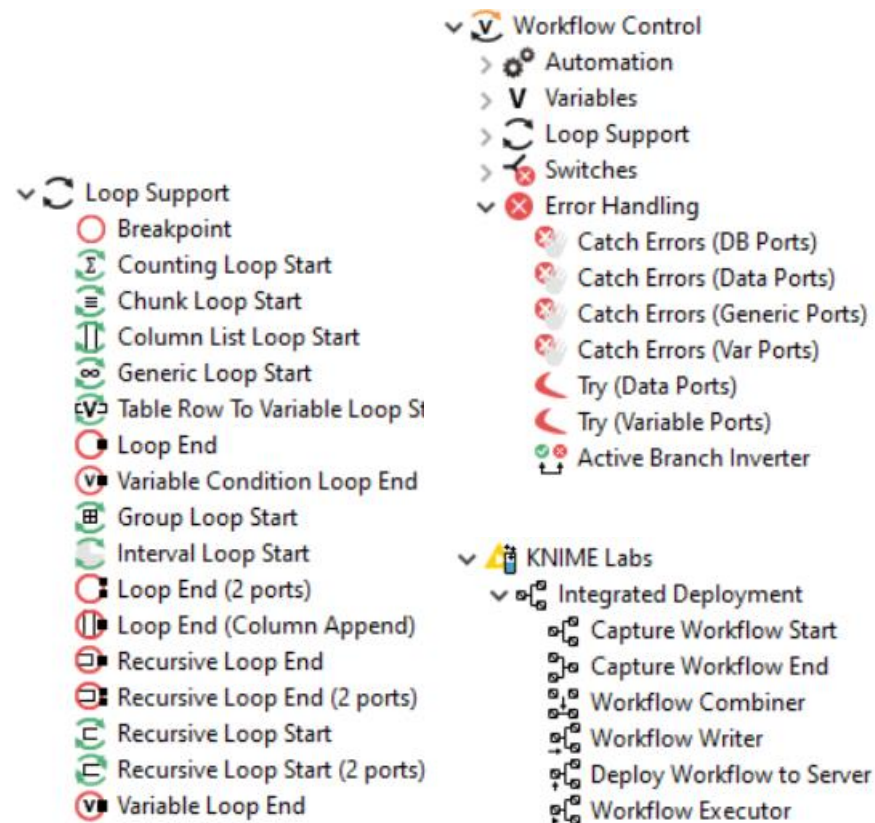


KNIME Features for Components

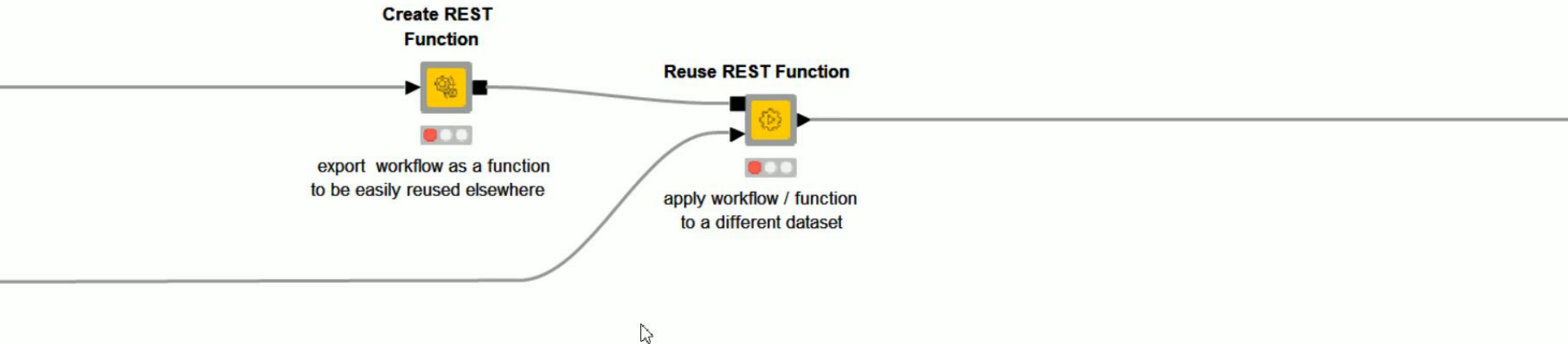
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Advanced Workflow Control inside Component

- Try / Catch nodes
 - offer contingency plans if something fails:
“if node fails, change workflow branch”
- Loop nodes
 - change settings of nodes and re-execute for each column/row/element in list
- Capture Workflow nodes (new)
 - define functions as piece of workflows to exchange them between components



Advanced Workflow Control inside Component

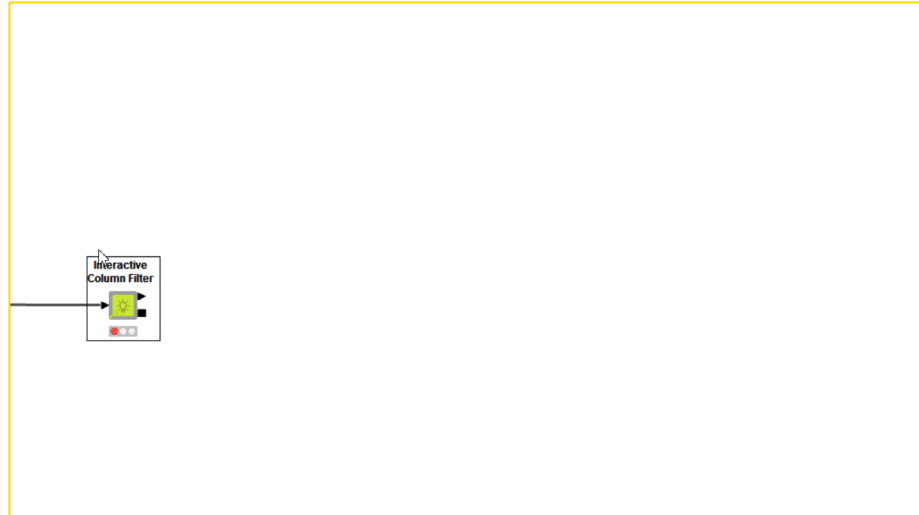


KNIME Features for Components

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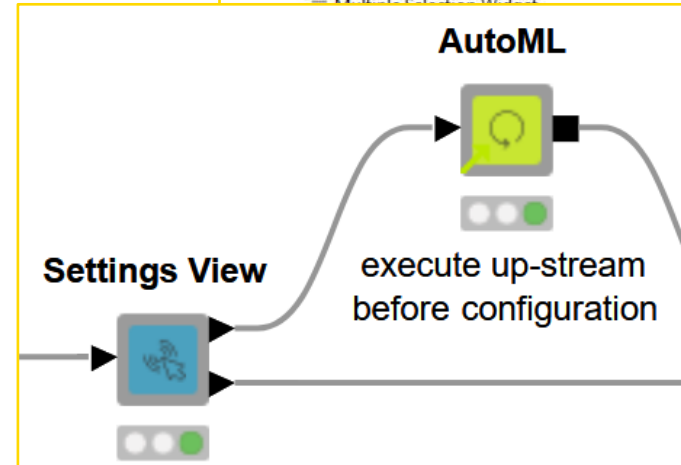
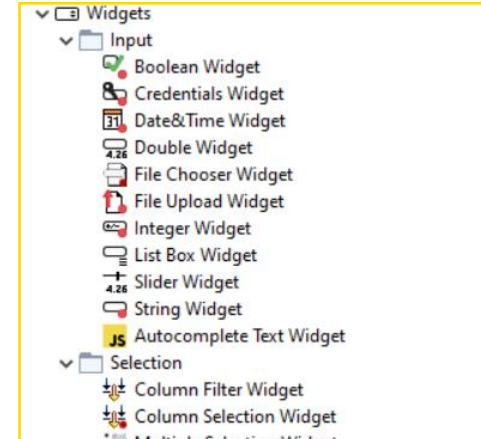
Component Composite Views

- Component Composite View
 - the generated view is based on view and widget nodes inside component
 - after the entire component executes, a dashboard can be opened to:
 - visualize the results
 - re-execute the component on new settings
- Widget nodes
- View nodes
- Layout panel
- Nested Components



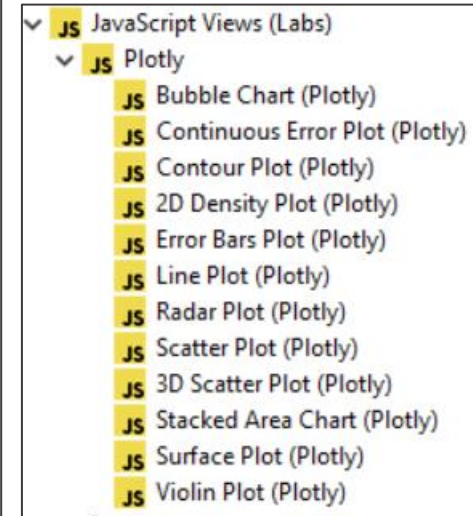
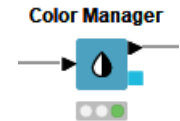
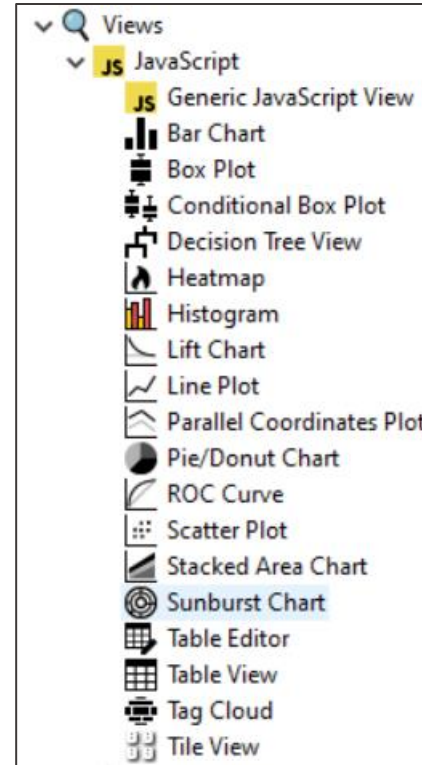
Component Composite Views

- Component Composite View
- Widget nodes
 - similar in naming and settings to the Configuration nodes
 - offer to change settings of workflow from an interactive view
 - if the controlled workflow is computationally expensive place the workflow in the following component
 - two of them are interactive filters
- View nodes
- Layout panel
- Nested Components



Component Composite Views

- Component Composite View
- Widget nodes
- View nodes
 - the visualizations, charts, plots of KNIME
 - Color Manager is essential
 - Plotly nodes recommended
 - custom interactivity between charts
- Layout panel
- Nested Components



Component Composite Views

- Component Composite View
- Widget nodes
- View nodes
- Layout panel
 - user friendly panel to decide the layout of the dashboard
 - available as soon as a widget or view node is inside the component
- Nested Components

Component Composite Views

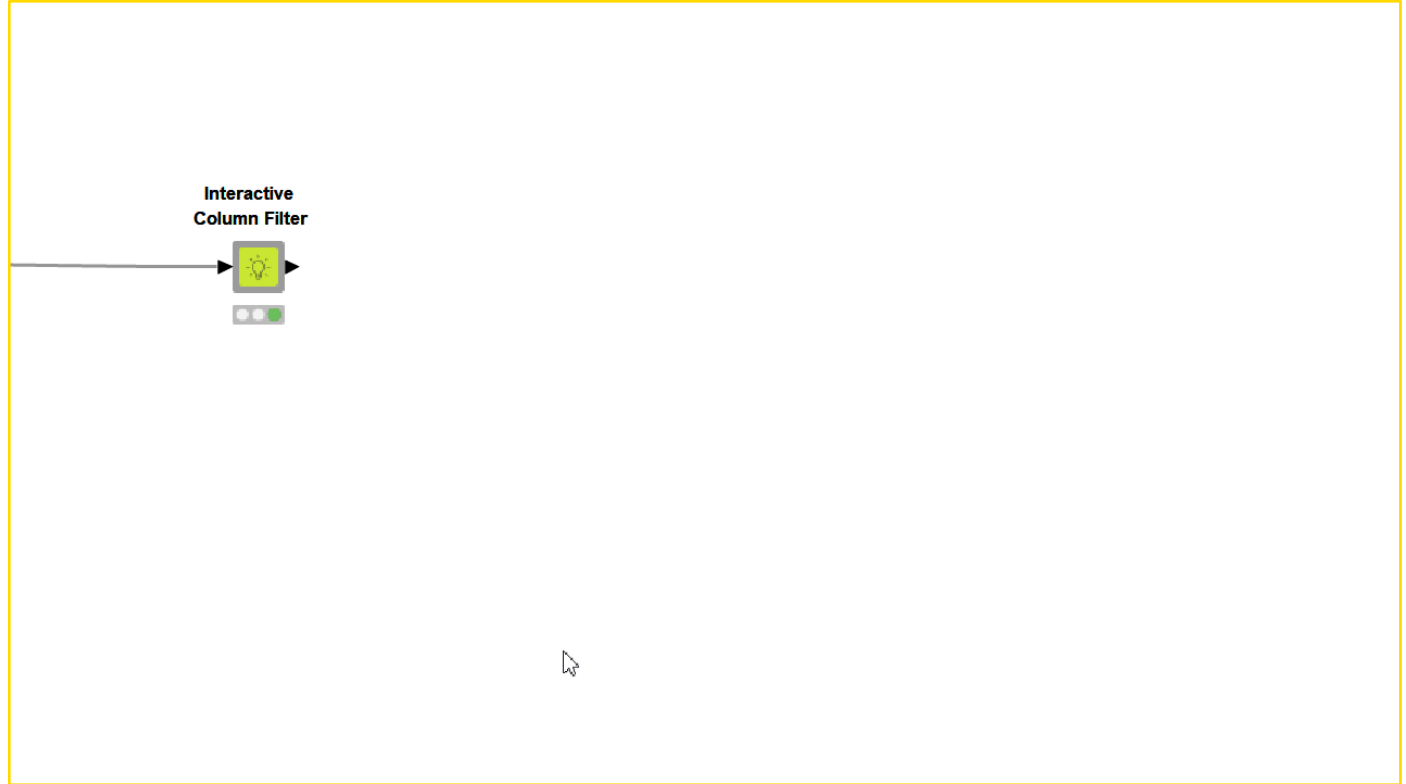
- Component Composite View
- Widget nodes
- View nodes
- Layout panel
- Nested Components
 - generally useful when structuring the inside workflow of a complex component
 - especially useful when building a complex composite view which populates with different charts depending on user or data conditions

KNIME Features for Components

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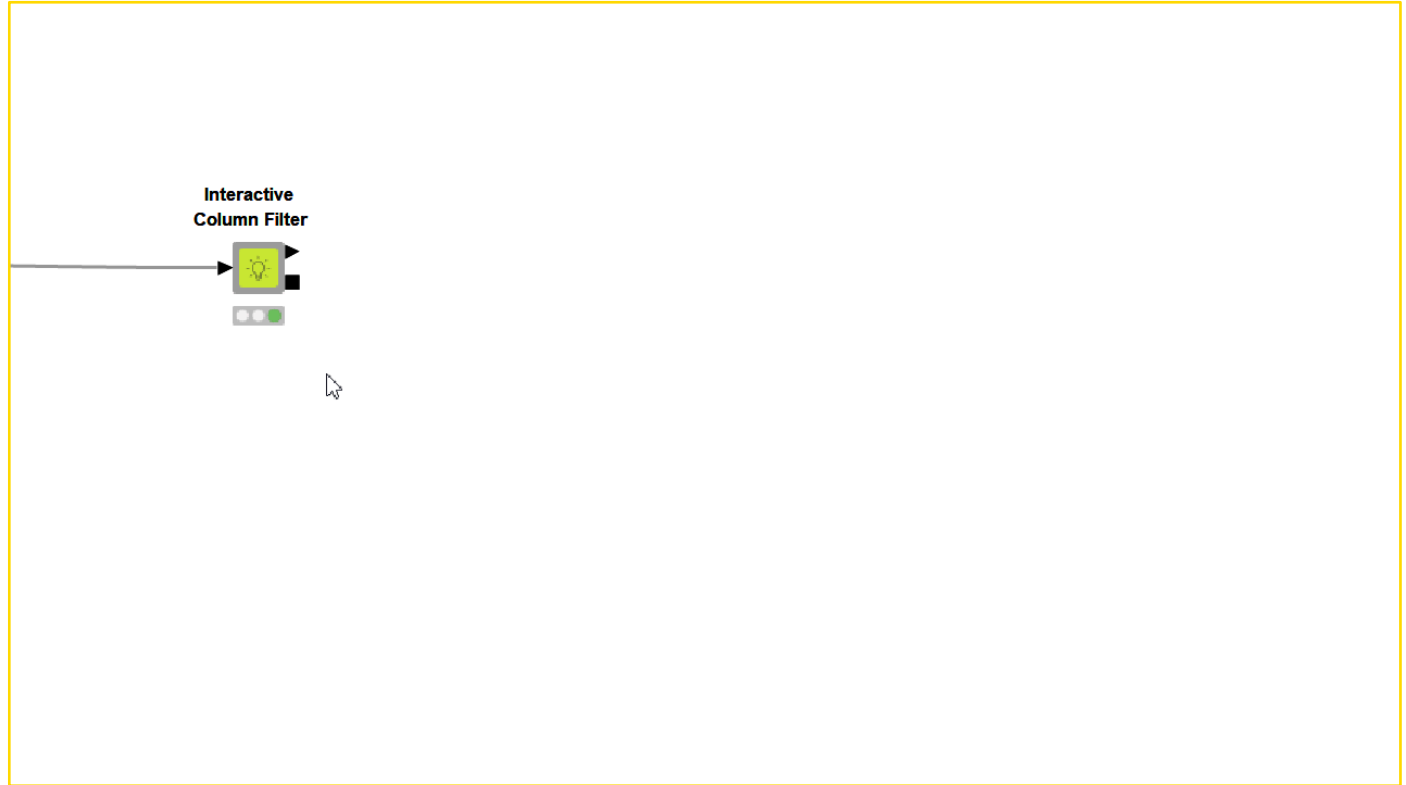
Component Documentation

- **Ports**
- Component Notes
- Logo and Color
- Description
- Configuration Instructions



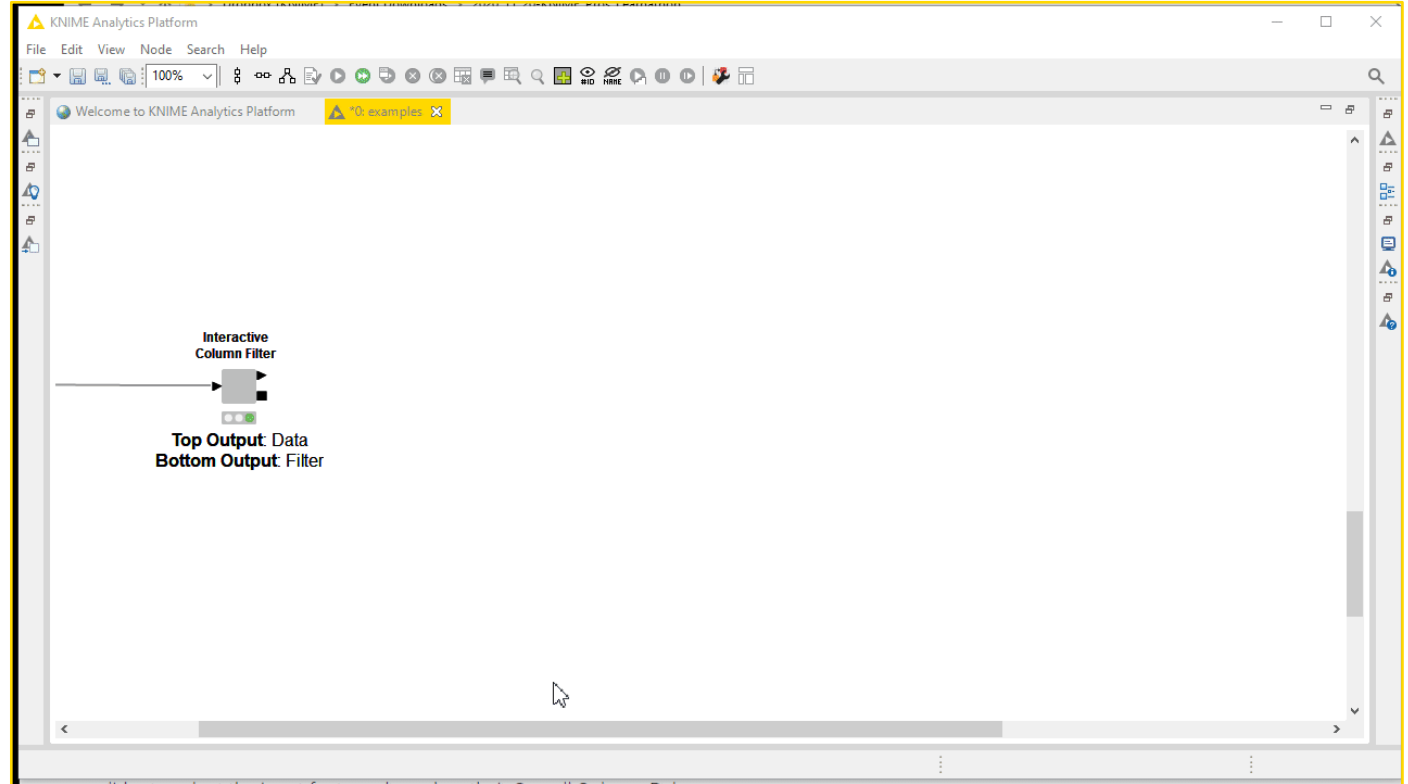
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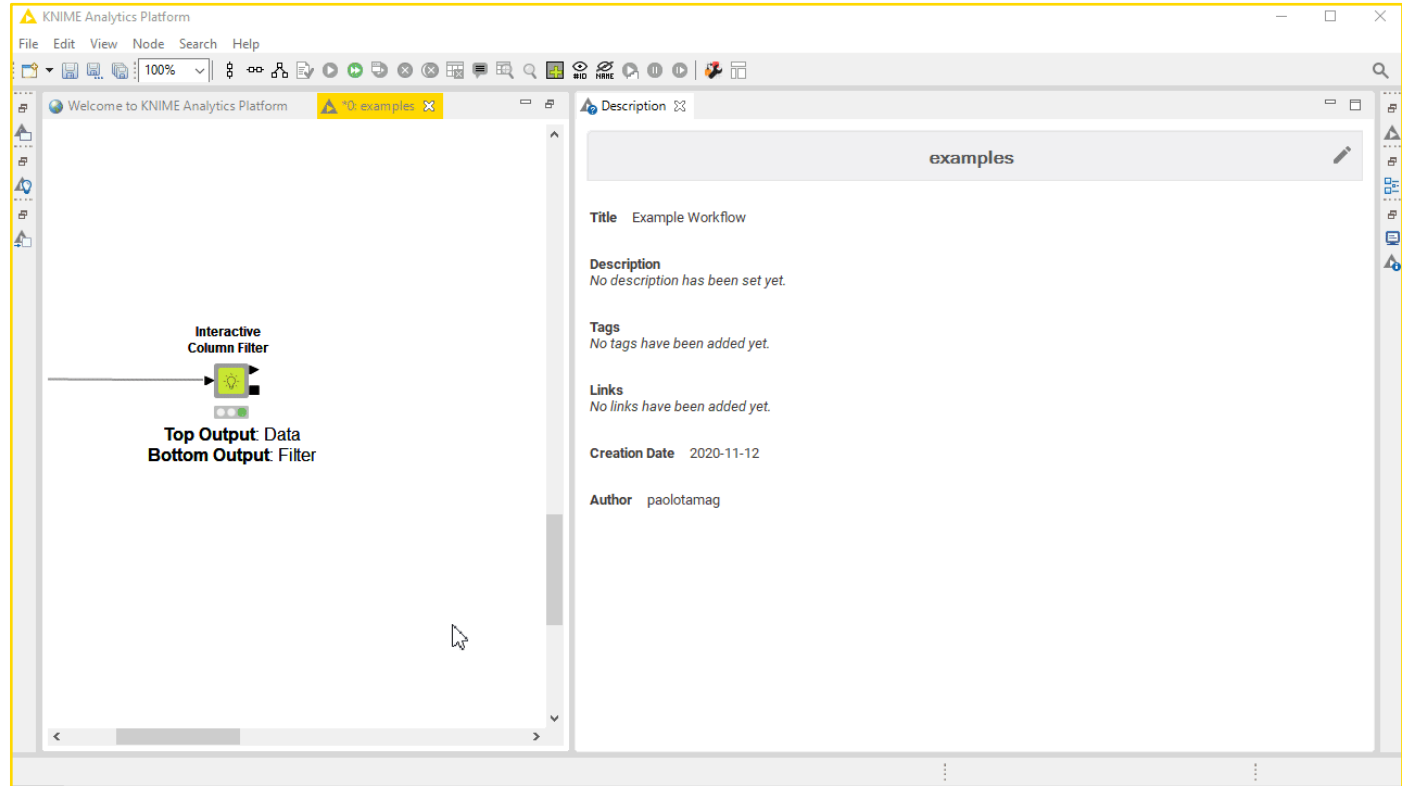
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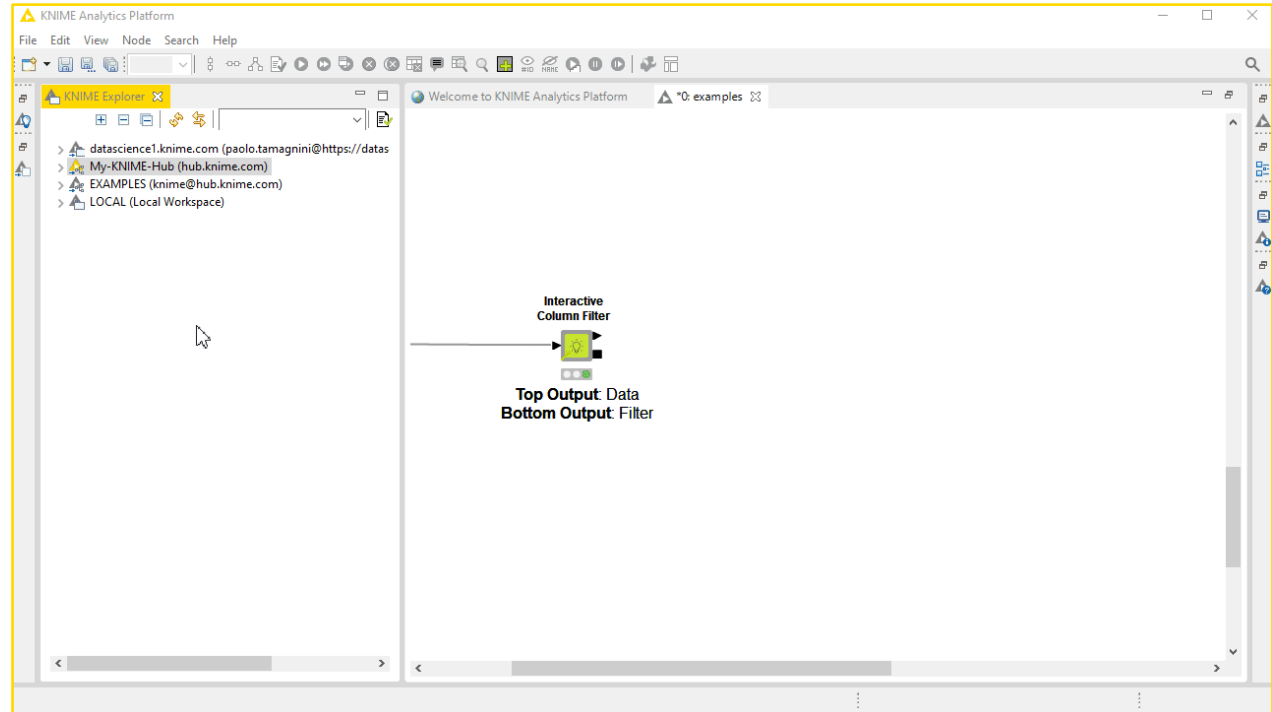


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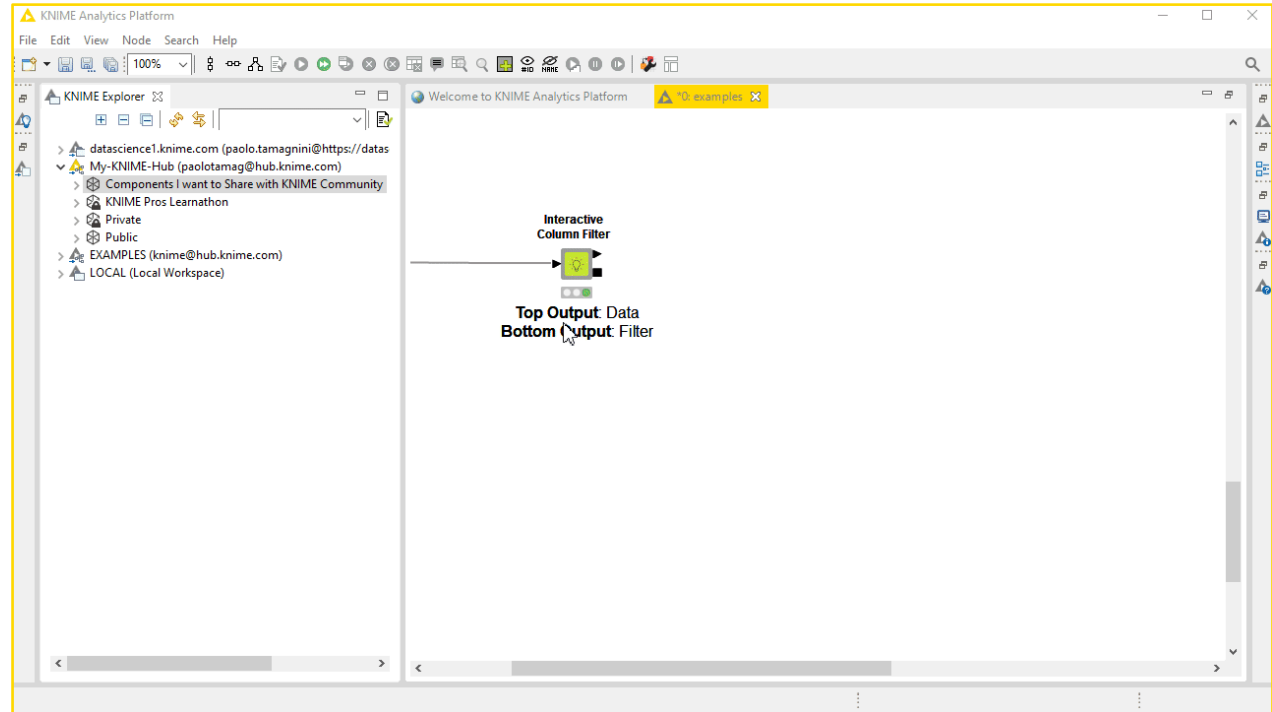
Component Sharing

- **Public Spaces**
- **Sharing Components**
- Using and updating Components
- Shared Component Link
- Collaboration Spaces (not out yet)



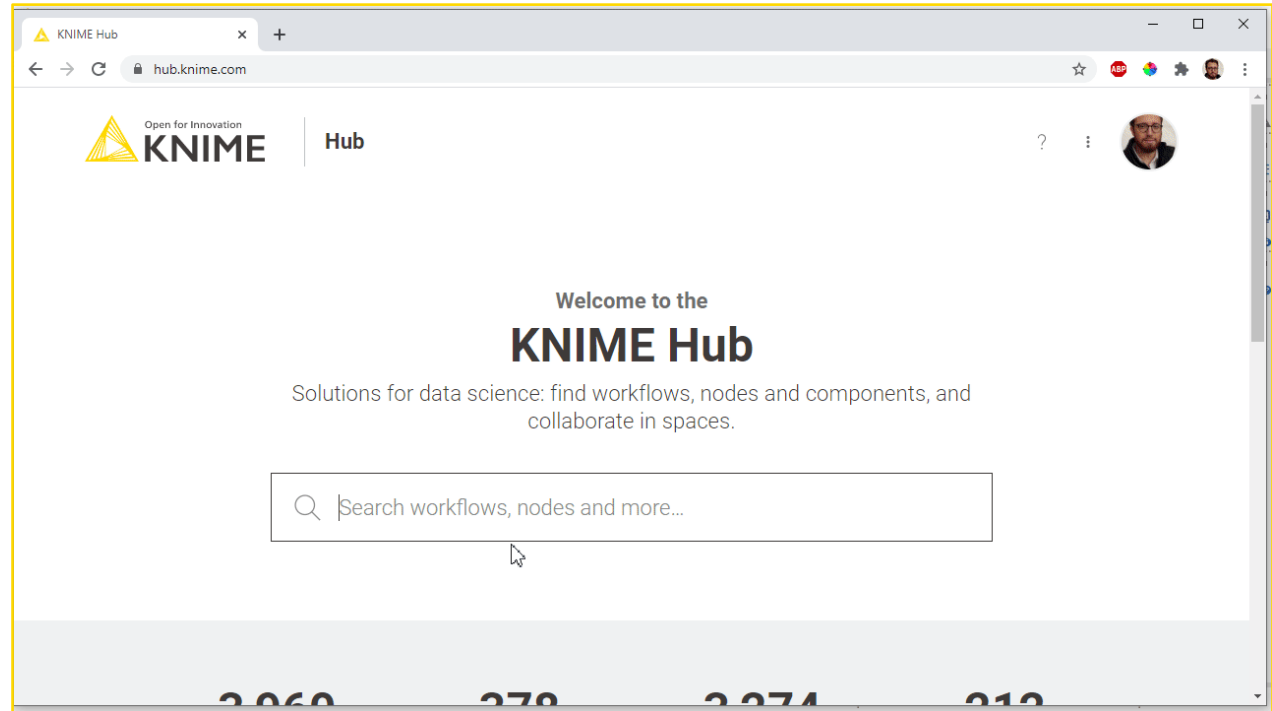
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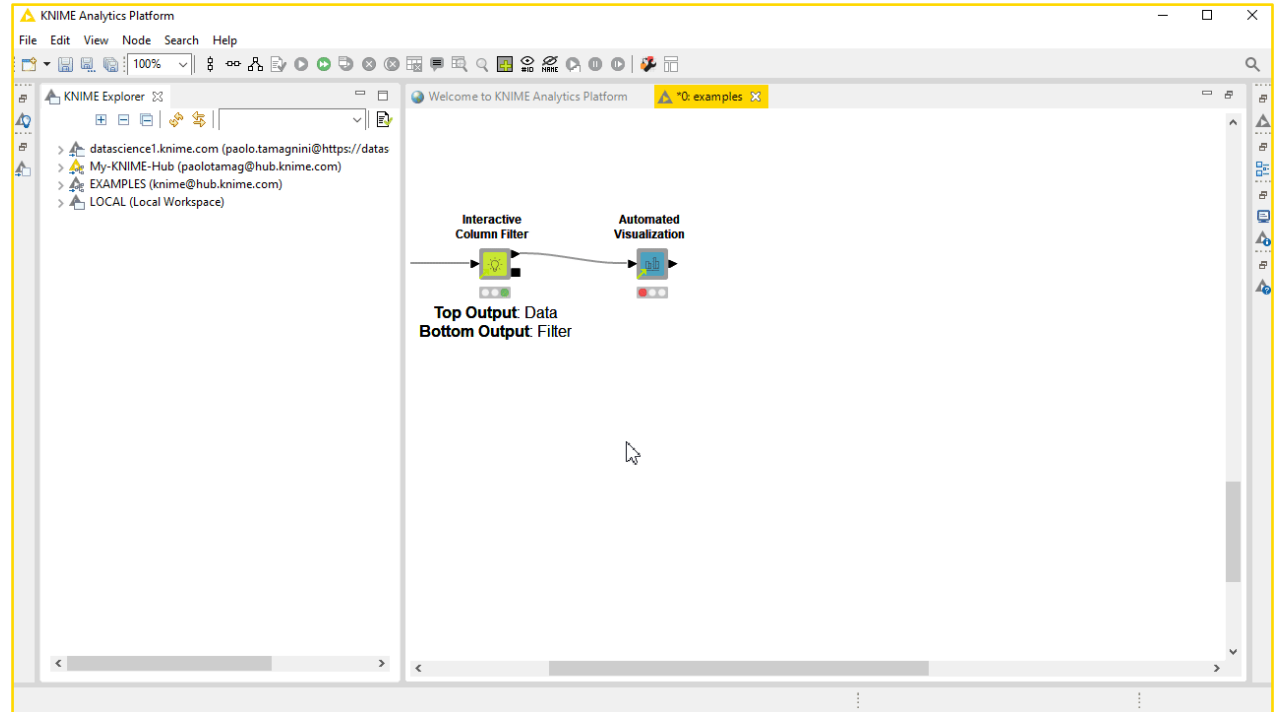
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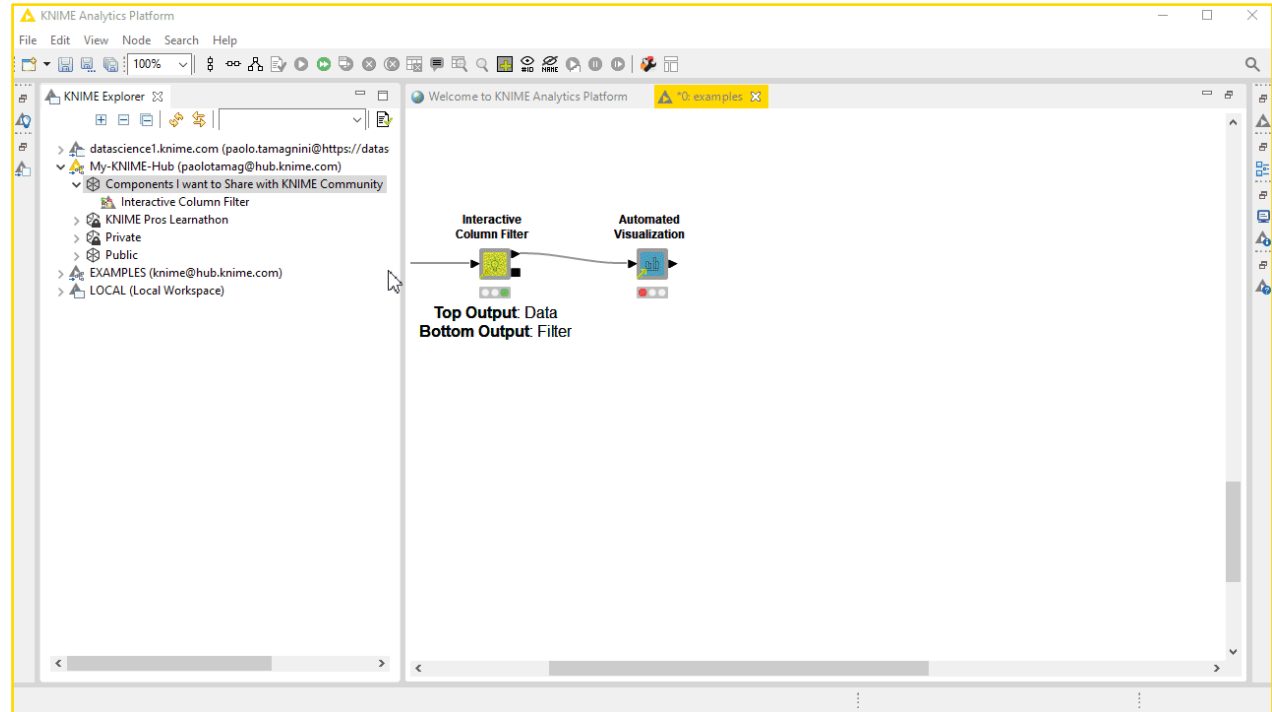
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Component Sharing

- Public Spaces
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Three Parallel Tracks via Zoom Breakout Rooms!

Main Zoom Session

Group 1 Financial Analysis



Maarit

KNIME Team Member



Lada

KNIME Team Member

Group 2 Life Sciences



temesgen-dadi

KNIME Team Member



Francosinus

KNIME Team Member

Group 3 Automation



paolotamag

KNIME Team Member

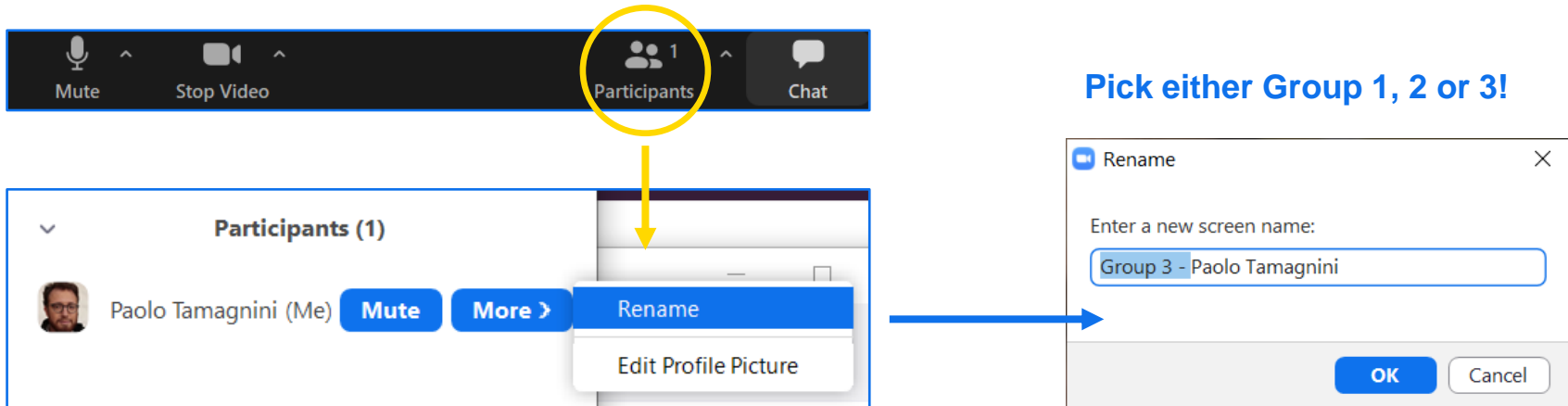


Mpattadkal

KNIME Team Member

Virtual Learnathon Logistics

- Tutorial of Exercises via live demos
- *(Optional)* Follow us on your machine with KNIME Analytics Platform
- *(Optional)* Download exercises from: tinyurl.com/KNIME-Pros-Stuff
- Please rename yourself in the following way!



The image shows a Zoom interface. At the top, the 'Participants' button is circled in yellow. Below it, the 'Participants (1)' list shows 'Paolo Tamagnini (Me)' with a 'More' button. A yellow arrow points from the 'More' button to a 'Rename' dialog box. The dialog box has the title 'Rename' and a text input field containing 'Group 3 - Paolo Tamagnini'. A blue arrow points from the 'Rename' button in the dialog box to the 'Rename' button in the 'More' menu.

Pick either Group 1, 2 or 3!

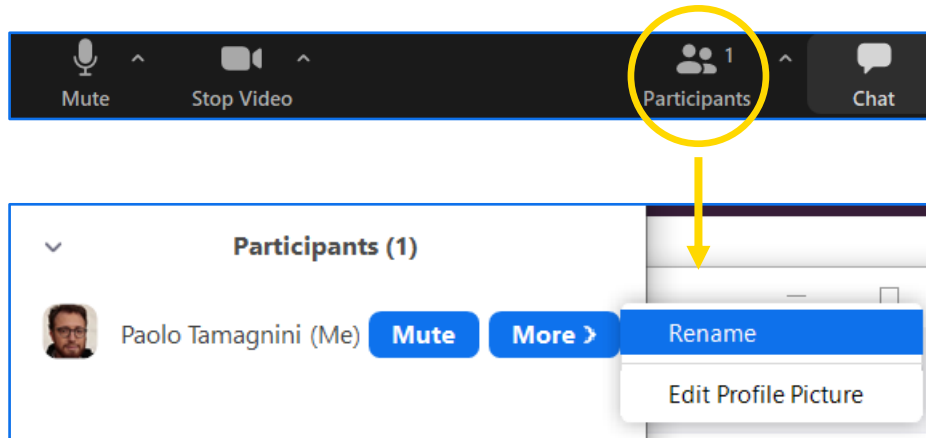
Virtual Learnathon Logistics

- Pick your Group now!!

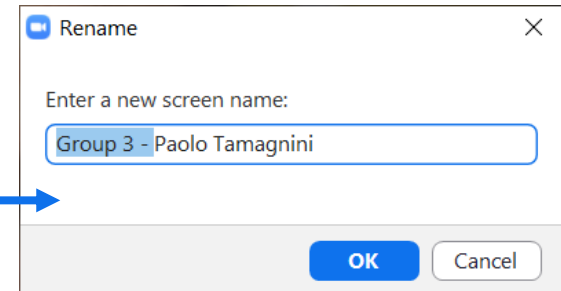
Group 1
Financial Analysis

Group 2
Life Sciences

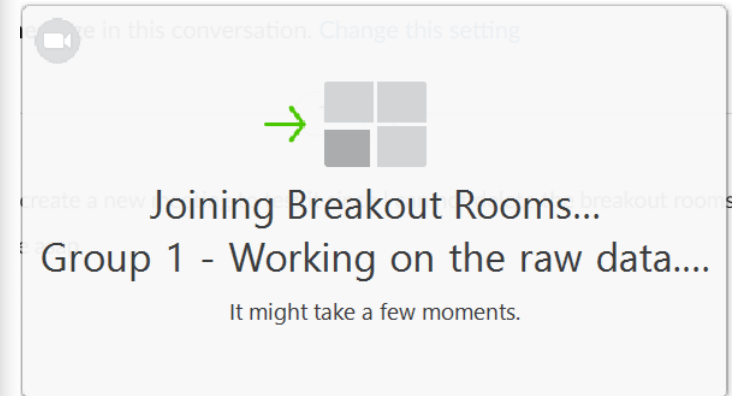
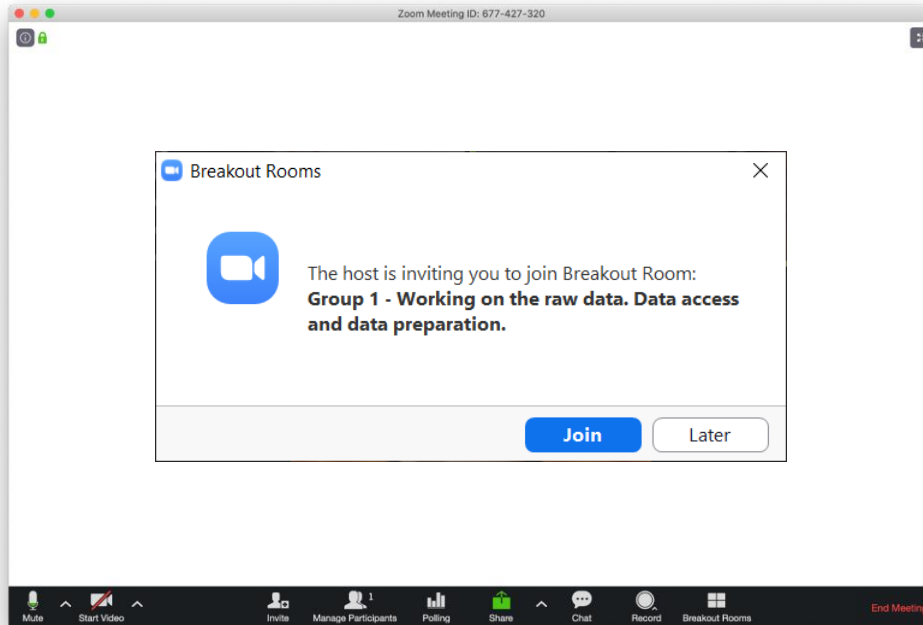
Group 3
Automation



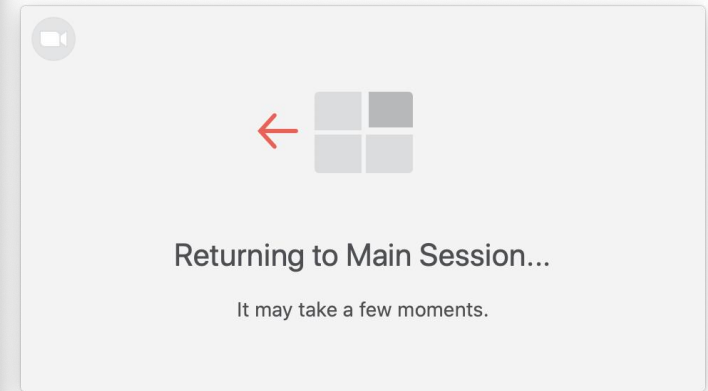
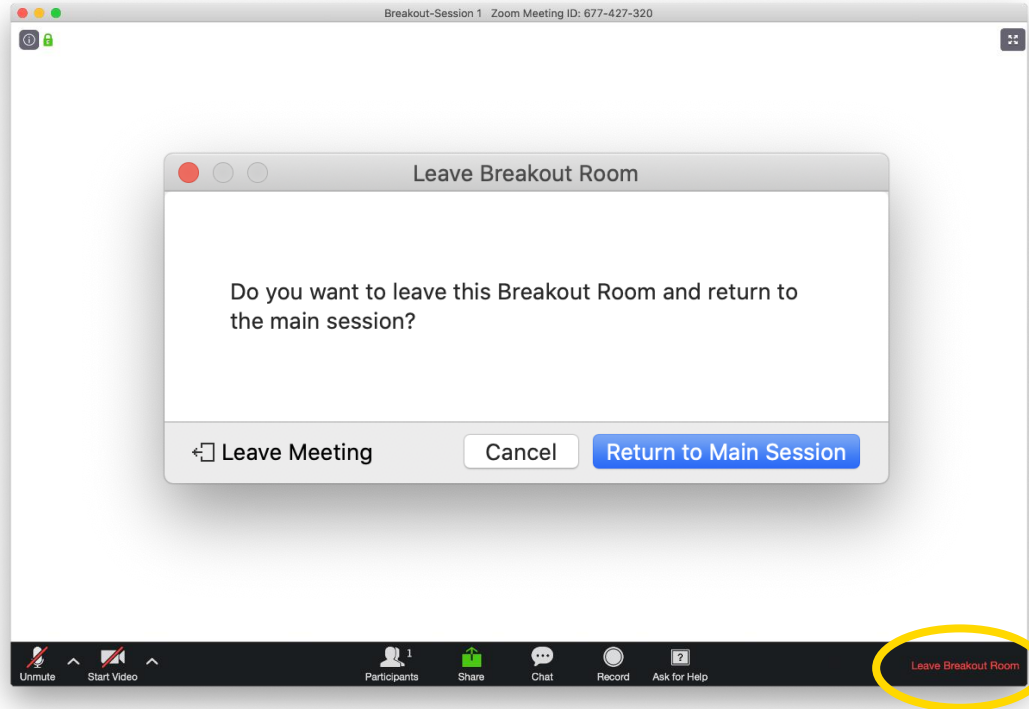
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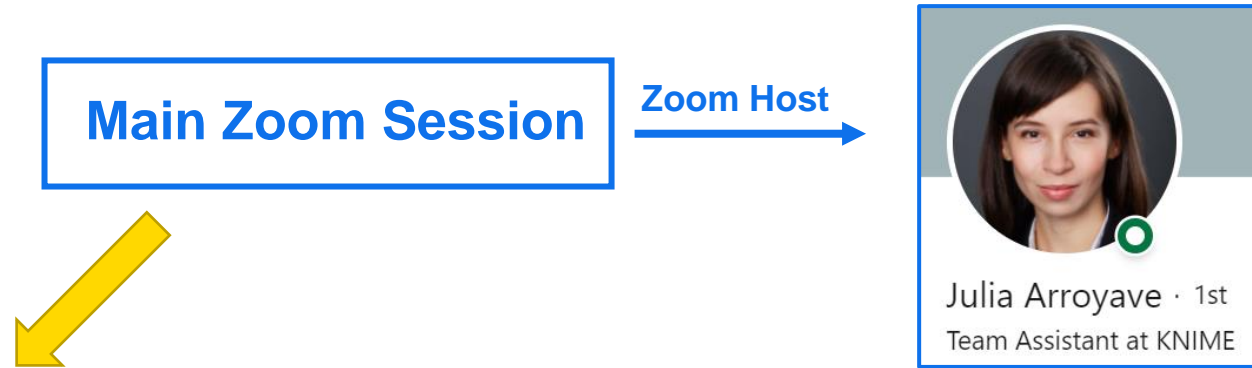
Zoom Feature: Breakout Rooms




Zoom Feature: Breakout Rooms




I am still in the Main Zoom Session: What do I do?



Group 1
Financial Analysis

▶  ◀



Maarit
KNIME Team Member

If you are **not** assigned :

- Wait to be assigned by the **Zoom Host** based on your new zoom name
- OR Wait to be called by the **Zoom Host specify your group** (e.g. “Group 1”) and you will be assigned

If you are having any technical issues :

- state what’s wrong either in microphone or in chat to seek more help from the Zoom Host

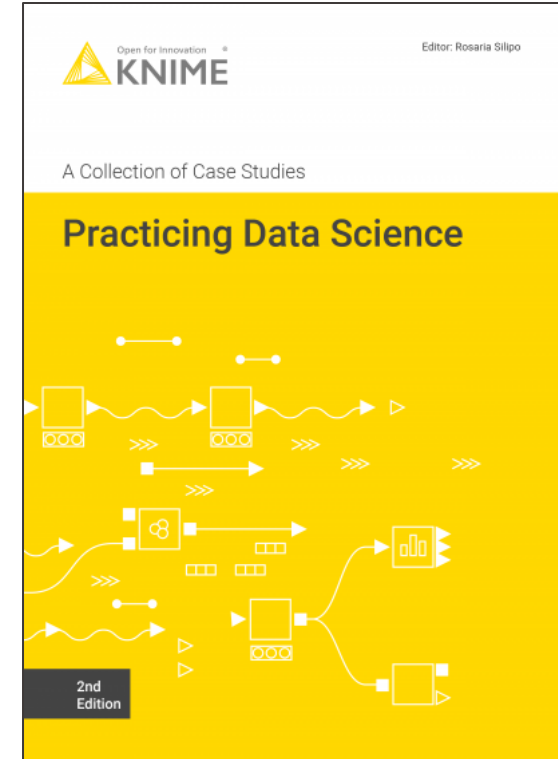
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See you soon in a Breakout Room!

Main Zoom Session

Group 1 Financial Analysis



Maarit

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KNIME Team Member

Group 2 Life Sciences



temesgen-dadi

KNIME Team Member



Francosinus

KNIME Team Member

Group 3 Automation



paolotamag

KNIME Team Member



Mpattadkal

KNIME Team Member

Three Parallel Tracks via Zoom Breakout Rooms!

Main Zoom Session

Welcome to:
Group 1.
Financial Analysis

Group 1 Financial Analysis



Maarit
KNIME Team Member



Lada
KNIME Team Member

- ▼ Group_1-Financial_Analysis
 - ▲ Group_1-Building_a_Component
 - ▲ Group_1-Building_a_Component-Solution

- Download exercises from:
tinyurl.com/KNIME-Pros-Stuff

OR

- Search **hub.knime.com** :
“KNIME Pros Learnathon Group 2”

Three Parallel Tracks via Zoom Breakout Rooms!

Main Zoom Session

Welcome to:
Group 2.
Financial Analysis

Group 2 Life Sciences



temesgen-dadi
KNIME Team Member



Francosinus
KNIME Team Member

- Group_2-Life_Sciences
 - Group_2-Building_a_Component-Solution
 - Group_2-Building_a_Component_for_Reading_Biological_Sequence_Files

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Main Zoom Session

Welcome to:
Group 3.
Automation


Group 3 Automation



paolotamag 
KNIME Team Member



Mpattadkal
KNIME Team Member

- ▼  Group_3-Automation
 - ▲ Group_3-Activity_1-Configuration_and_Logic
 - ▲ Group_3-Activity_2-Model_Capture_and_Export
 - ▲ Group_3-Activity_3-Composite_View
 - ▲ Group_3-Solution-Automation_Component

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“KNIME Pros Learnathon Group 3”