MachineLearnAthon - Microlecture
No code

MachineLearnAthon
A project Co-funded by the Erasmus+ programme of the European Union

No-Code approach

- Minimal coding required, visual interface dominate .
- Designed for business users and non-technical staff.
- Focus on accessibility and ease of use.

Key features:

- Visual tools and drag-and-drop interfaces.
- Pre-built templates for rapid development.
- Minimal technical expertise required.

Use Cases:

- Ideal for small-scale projects and prototyping.
- Common in business intelligence and automation.
- Used to create dashboards, forms, and reports.

Orange Data Mining

- An open-source data mining and machine learning platform.
- Provides a visual programming interface for data analysis.
- Designed for both beginners and experts in data science.

Origins of Orange

- Developed by the University of Ljubljana:
- Created by the Laboratory of Artificial Intelligence at the University of Ljubljana, Slovenia.
- Early development began in the late 1990s as a tool for teaching and research.

Vision

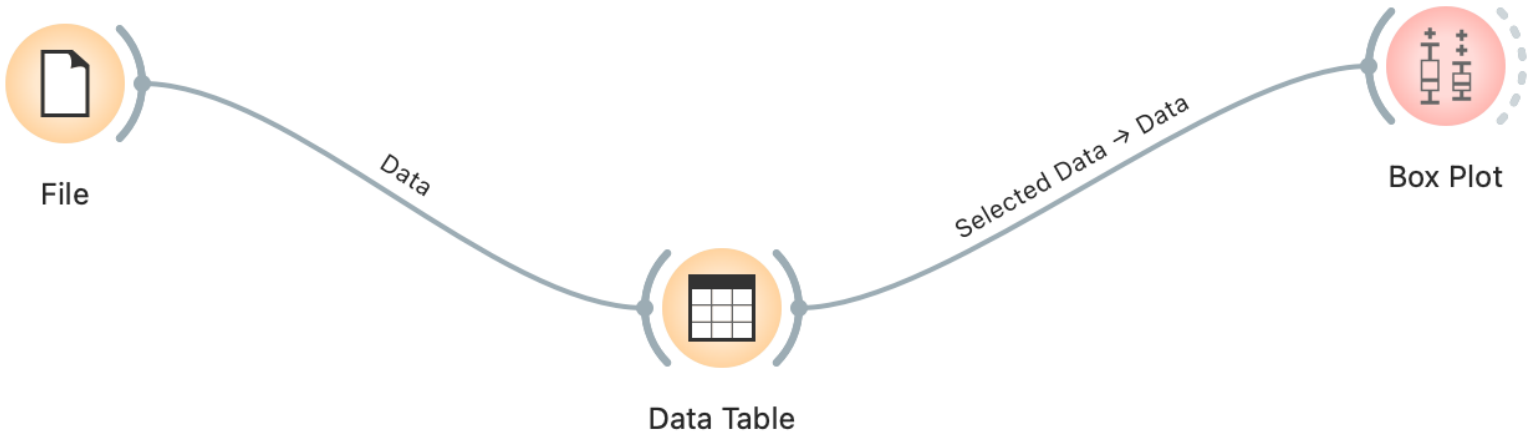
- To democratize access to advanced data mining tools.
- Combine ease of use with powerful analytical capabilities.

Download

- https://orangedatamining.com/

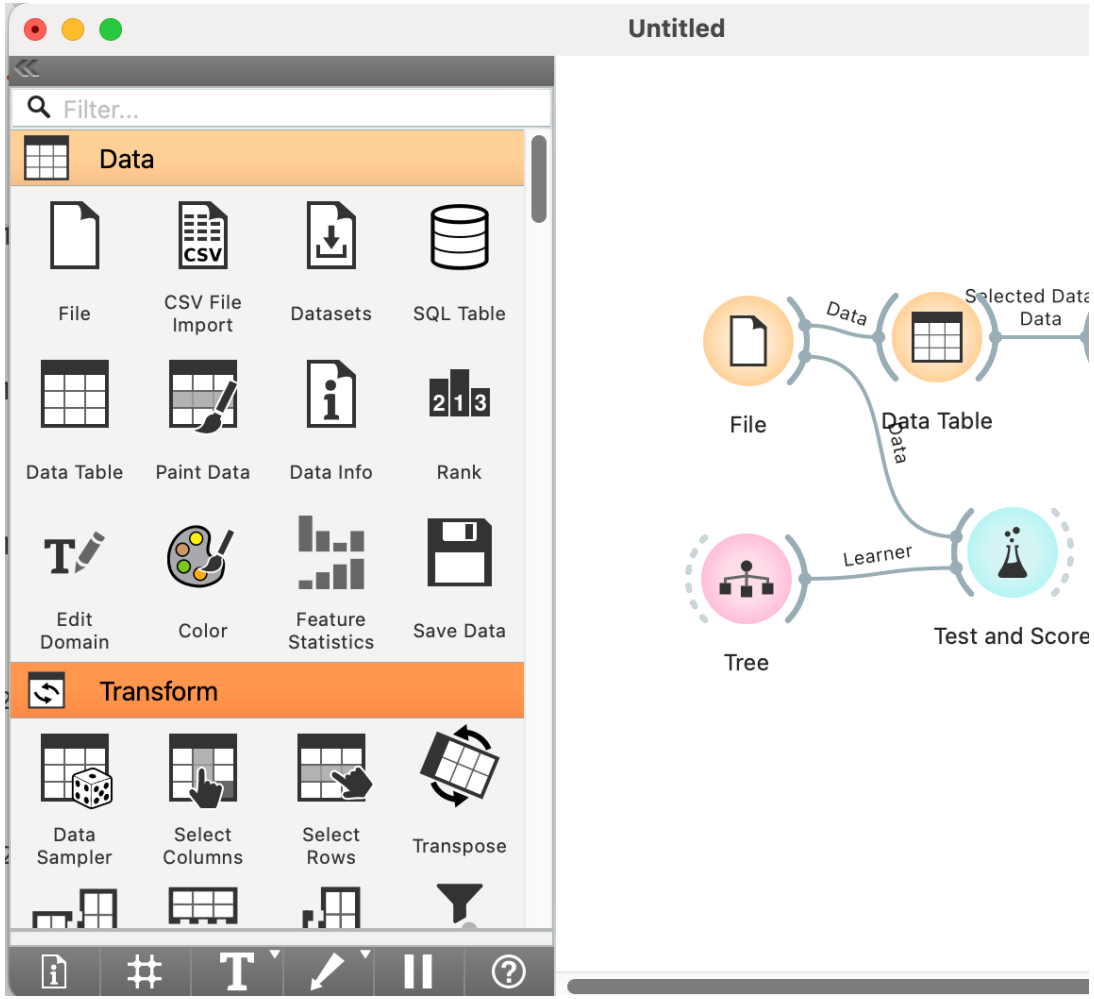
Orange ML: Overview and Features

- Visual programming for ML tasks.
- Interactive widgets for data analysis and modeling.
- Extensive libraries for preprocessing and visualization.
- Modular design: Add-ons for advanced tasks (e.g., text mining).
- Ease of use: Ideal for education, research, and prototyping.



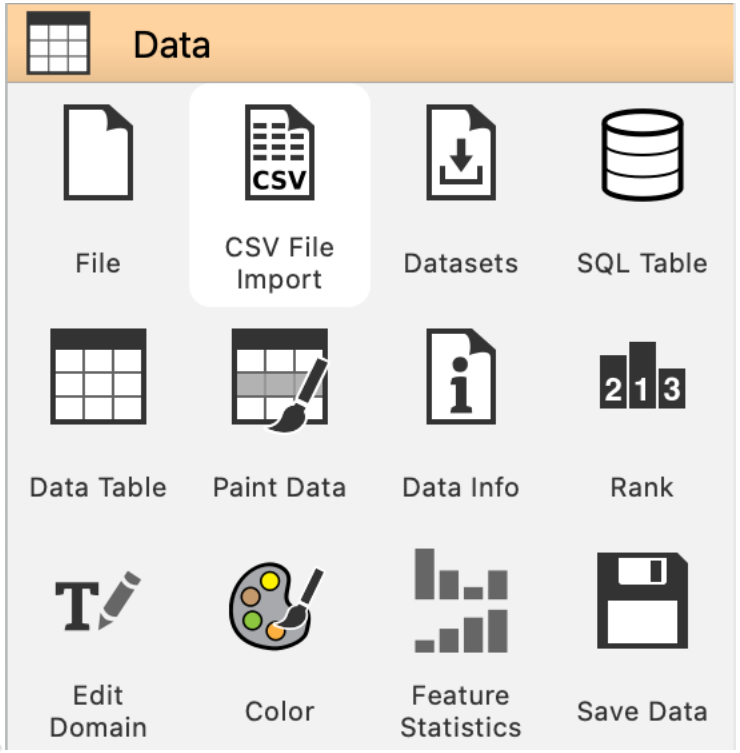
Orange Workflow

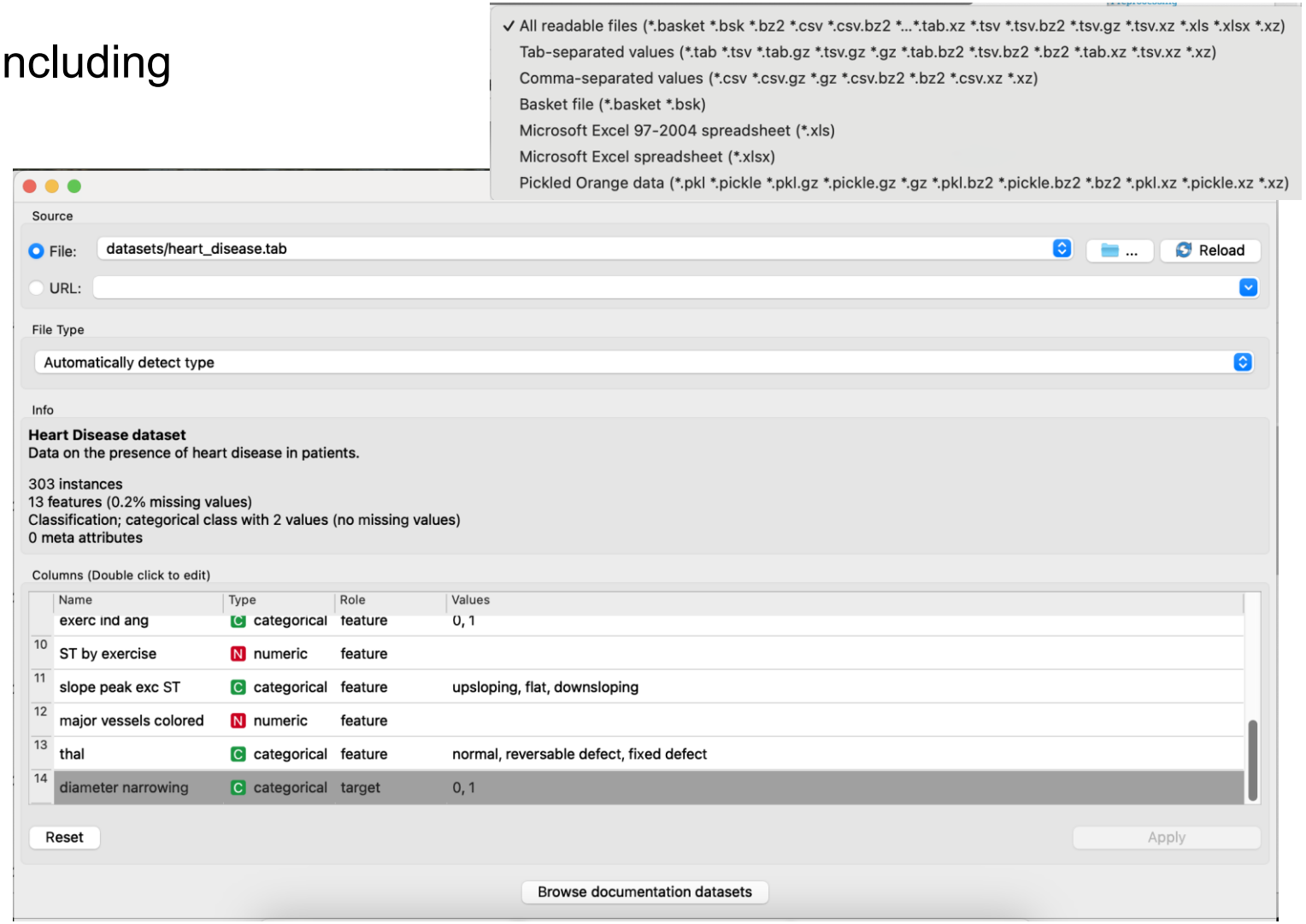
- Orange workflows consist of interconnected widgets.
- Widgets perform tasks such as data preprocessing, modeling, and visualization.
- Workflows are modular and highly customizable.



Step 1: Data Loading and Preprocessing

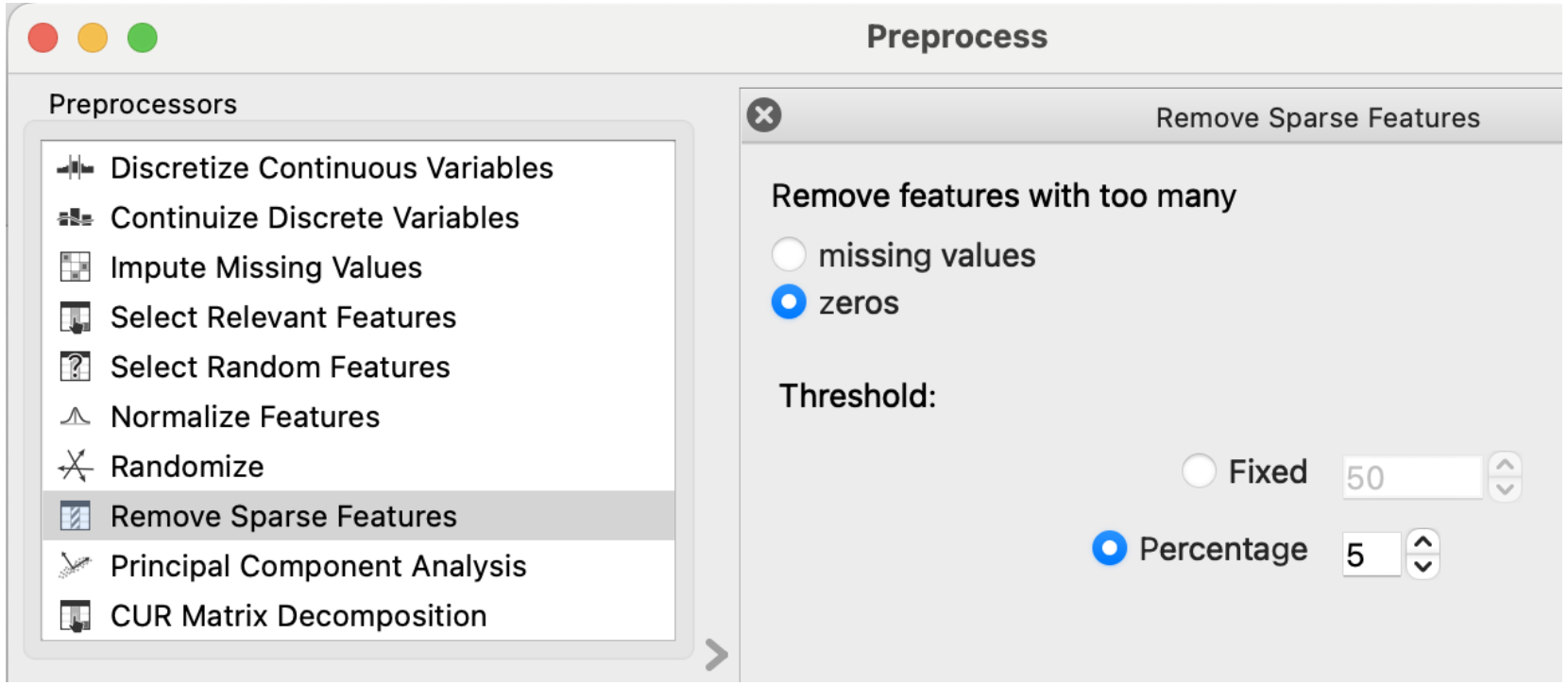
- Supports various data formats including CSV, Excel, and SQL

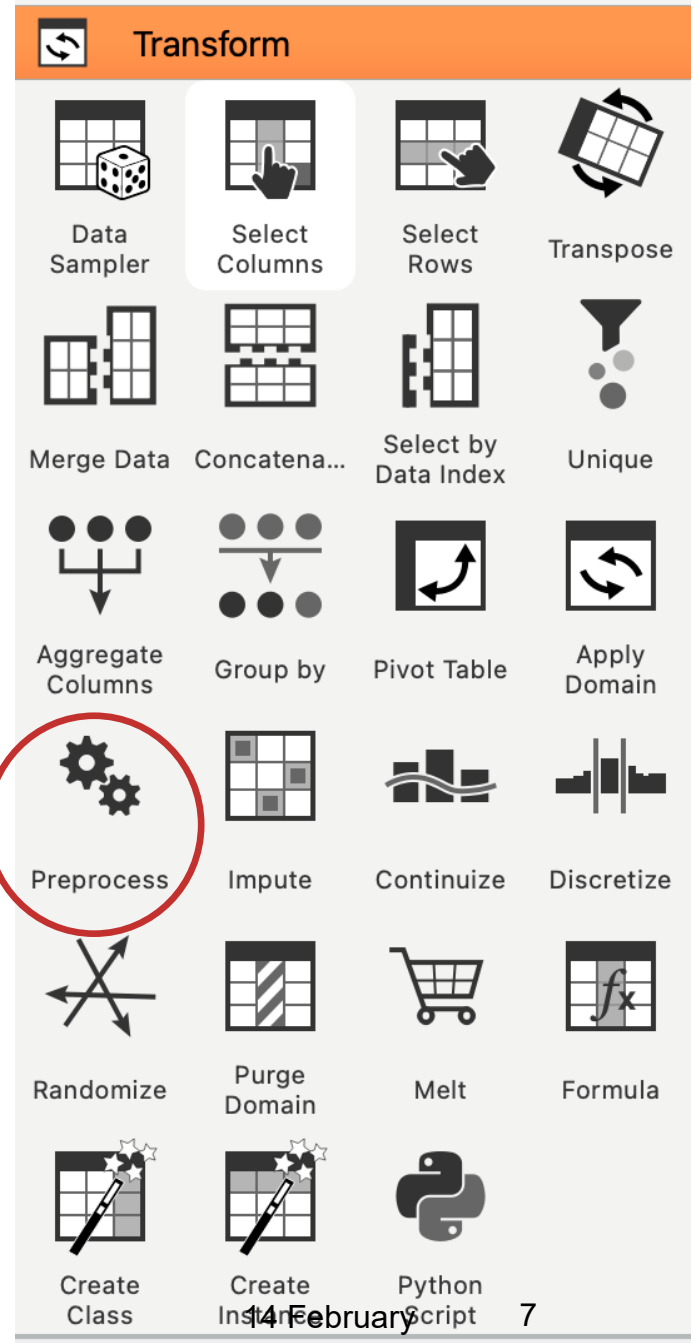




Step 2: Transformation

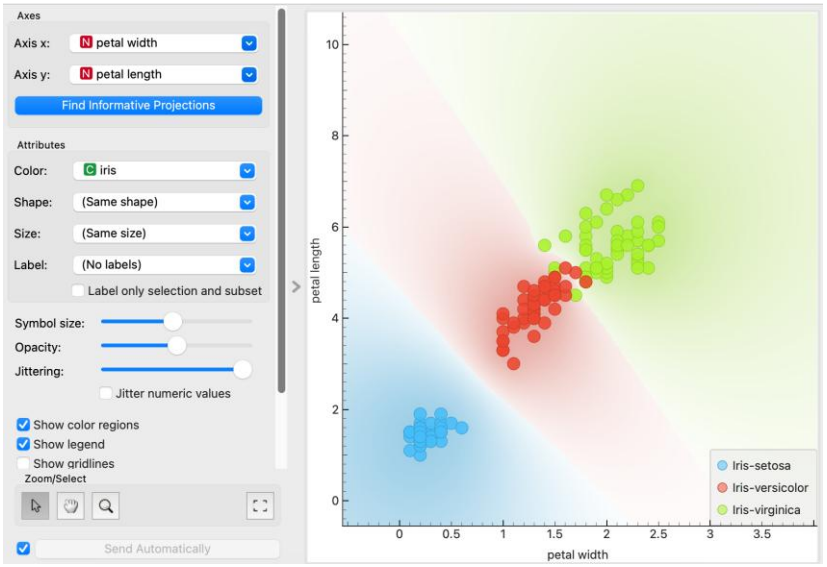
- Widgets for data cleaning, feature selection, and transformation.
- Handles missing values and data imputation.

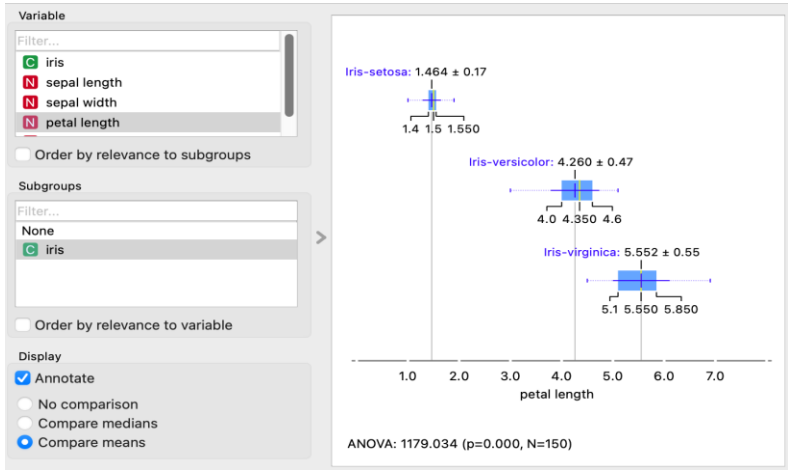


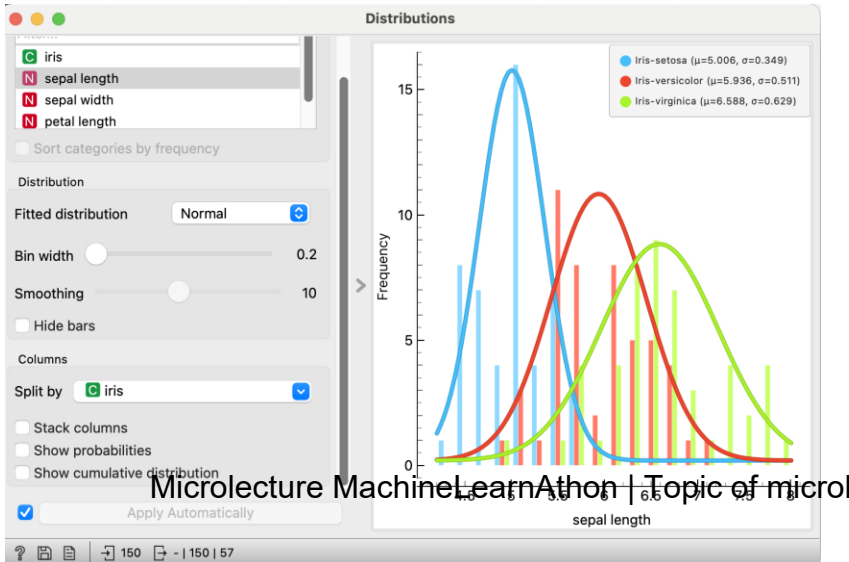


Step 3: Visualization

- Provides interactive plots for data exploration.
- Helps identify patterns and outliers in the data.

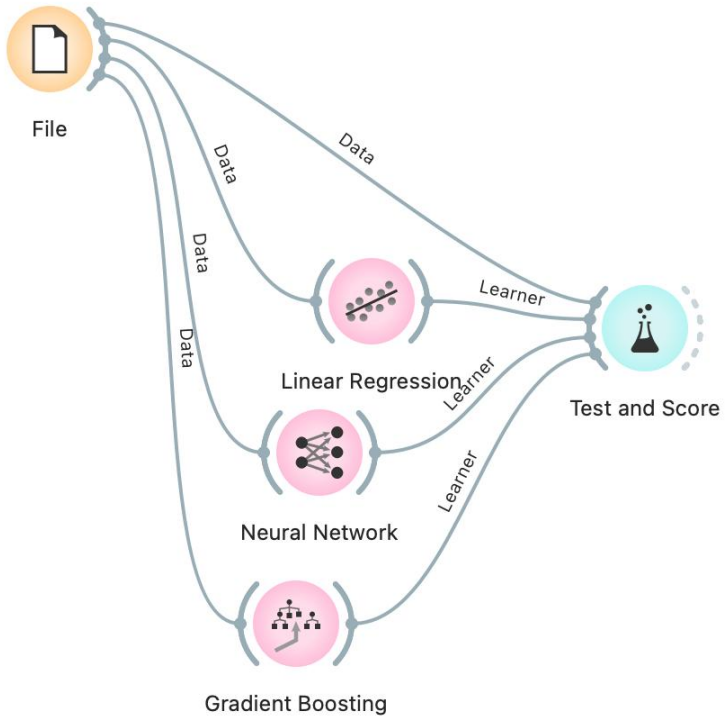


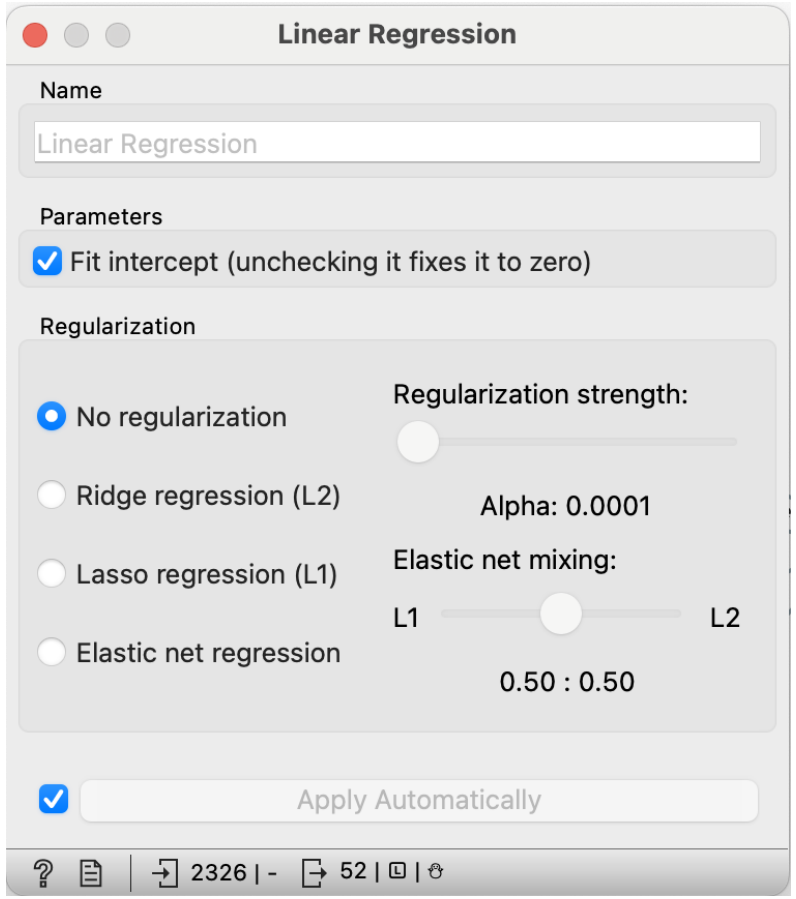


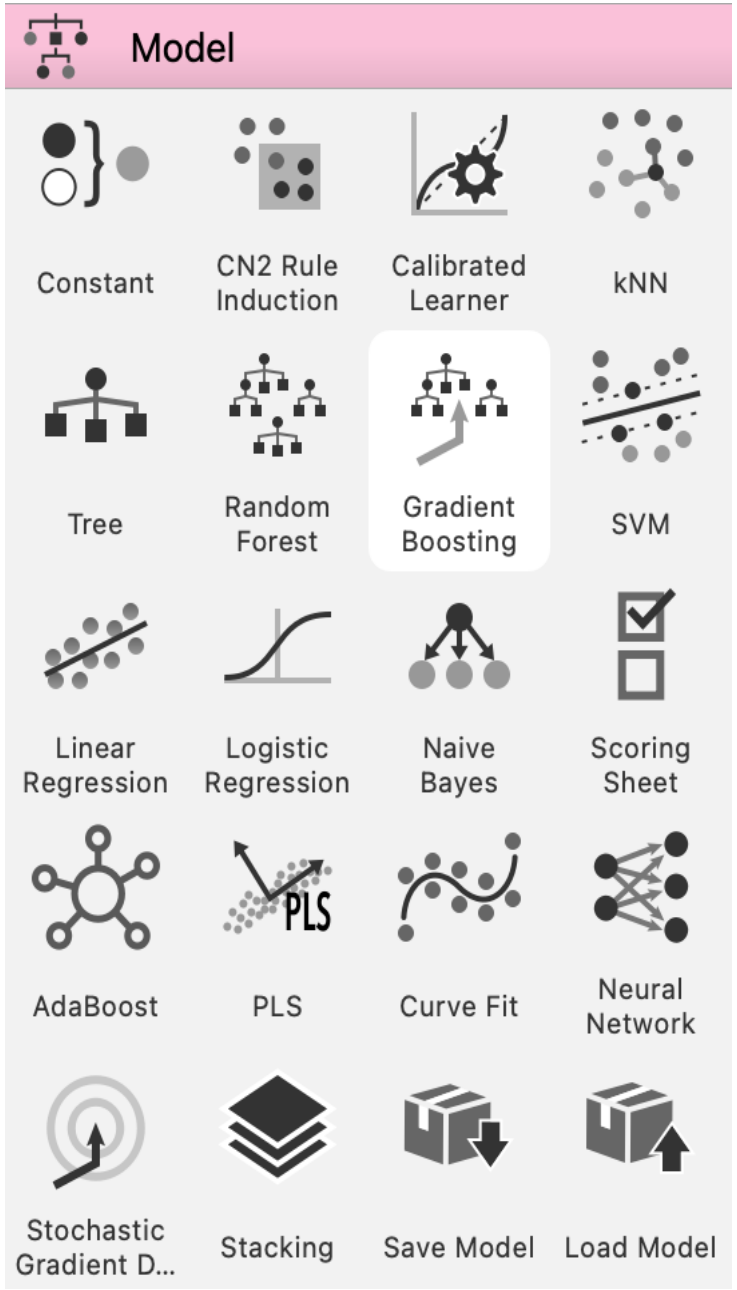


Step 4: Model Building

- Supports classification, regression, and clustering.







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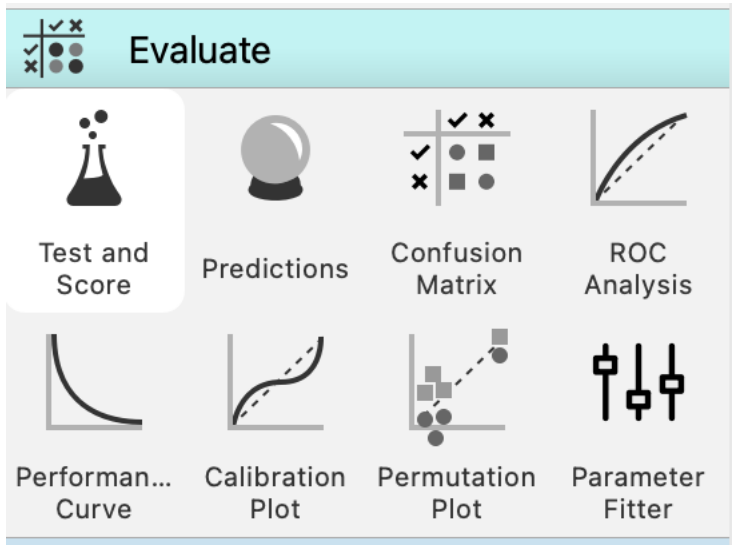
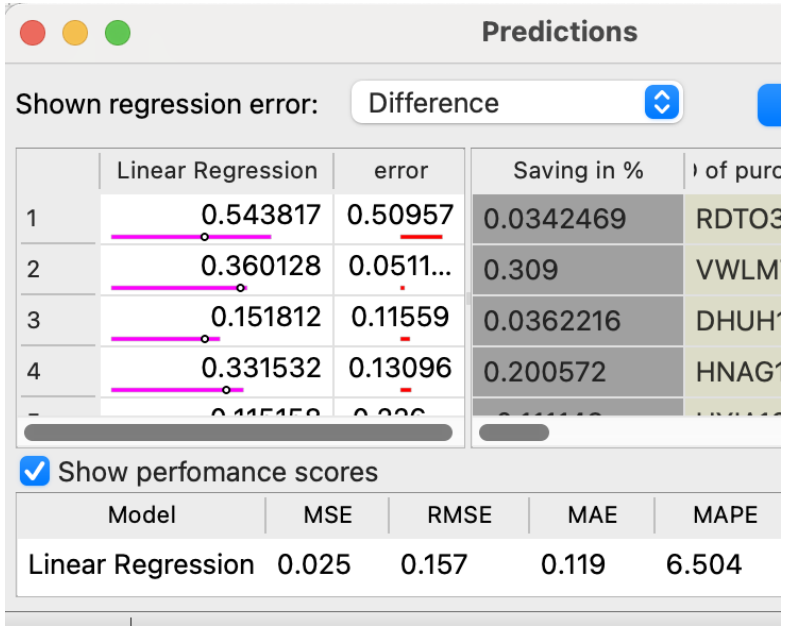
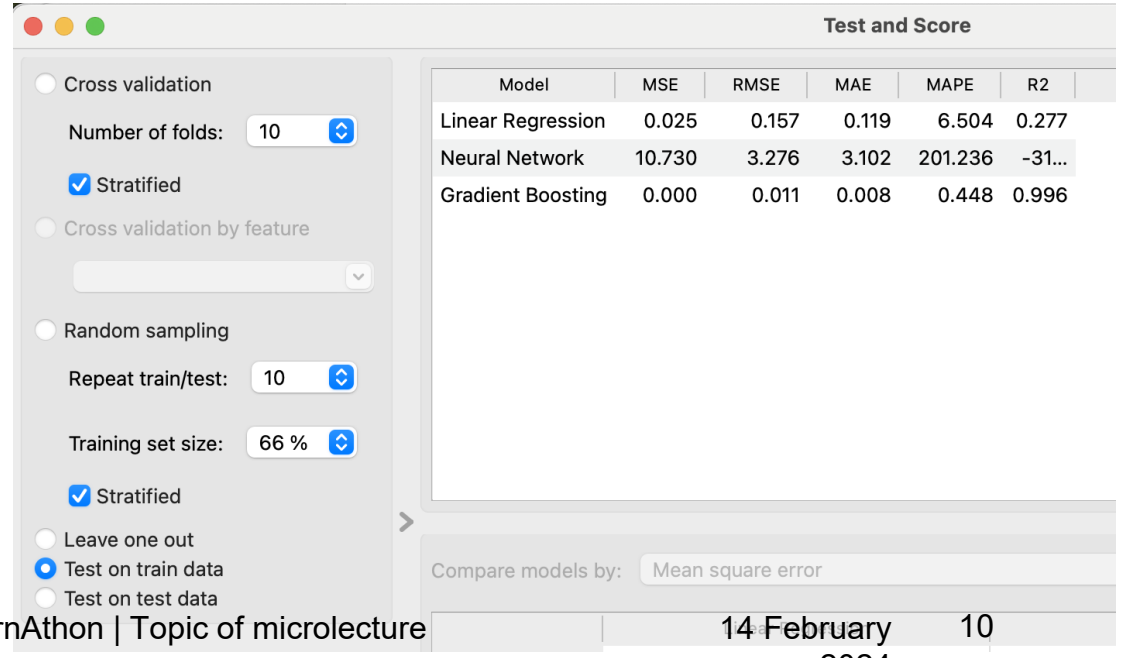
Step 5: Model Evaluation

- Evaluation widgets calculate metrics like accuracy, precision, and recall.
- Supports cross-validation and ROC curve analysis.
- Provides visual feedback on model performance.

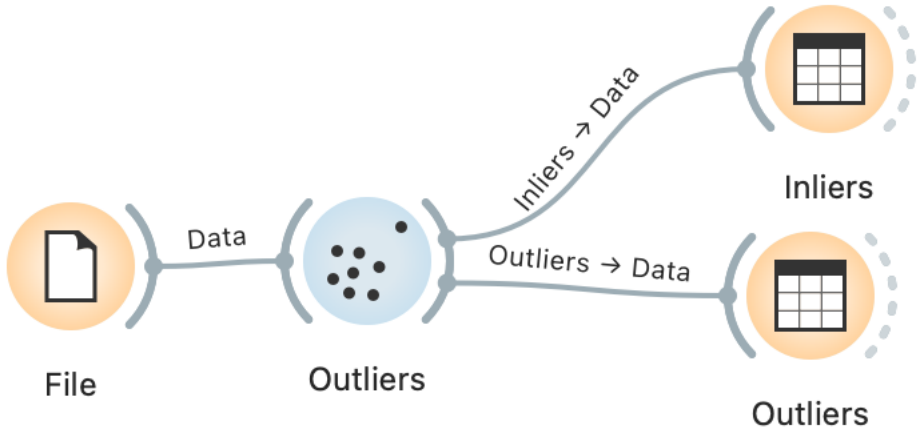


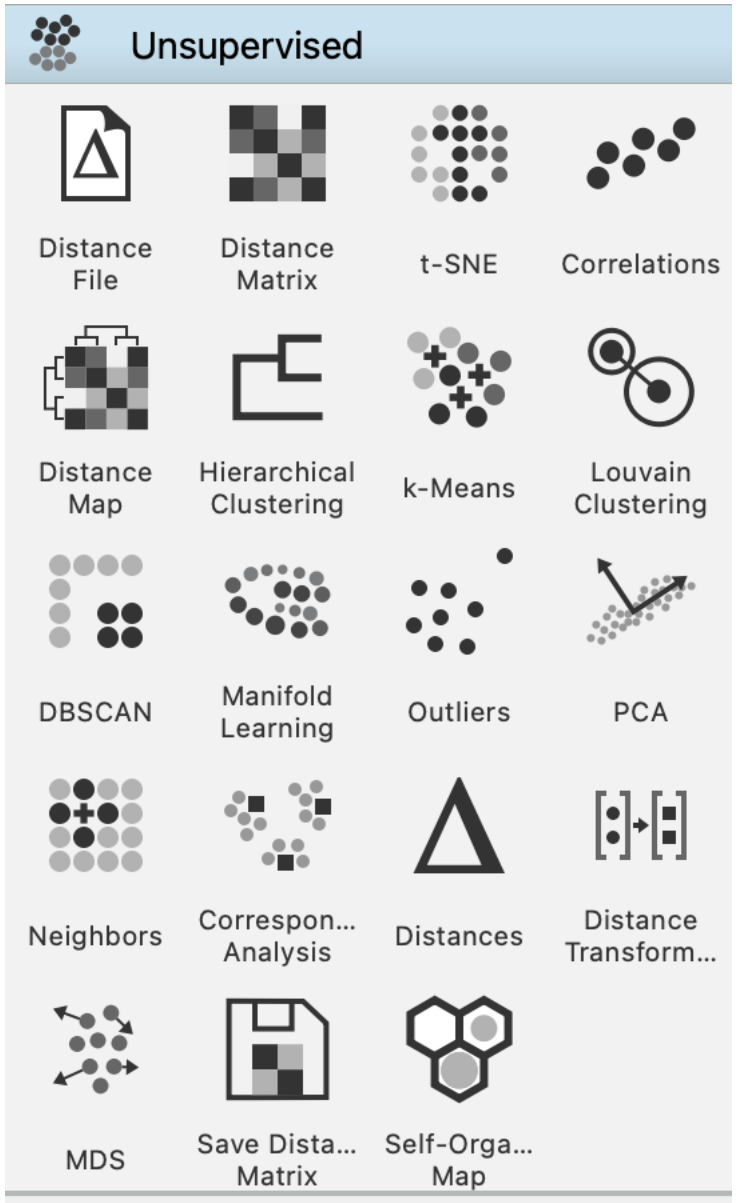




Unsupervised

- Unsupervised learning focuses on finding hidden patterns or structures in unlabeled data.
- Widget like clustering, dimensionality reduction, and data visualization.



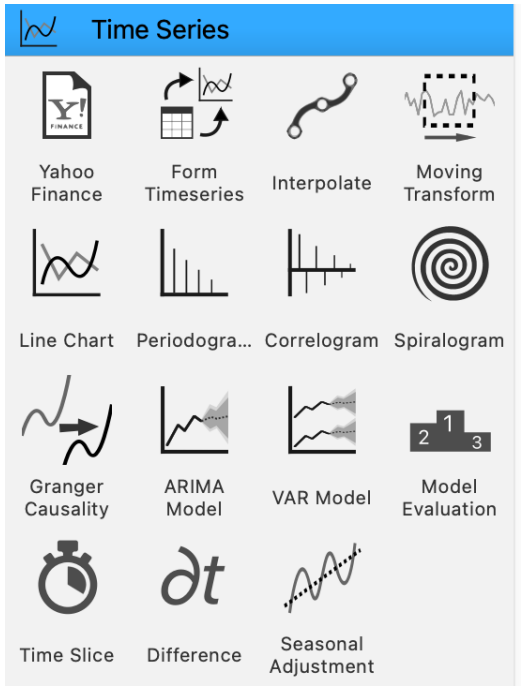


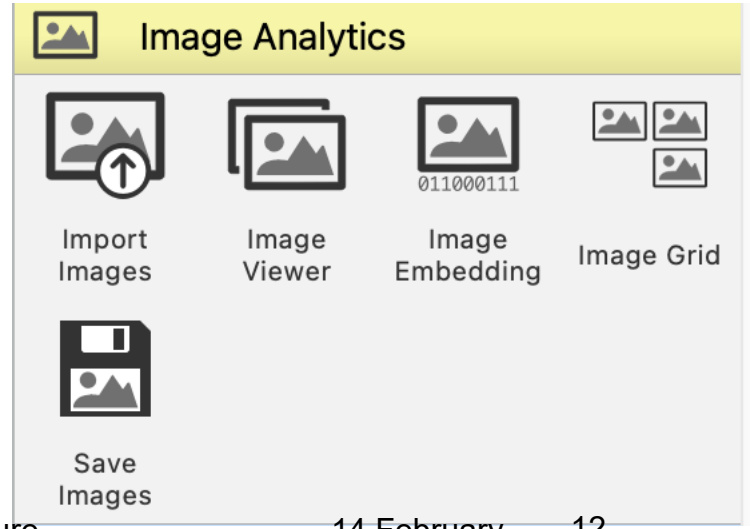
Advanced Widgets in Orange

- Text Mining: For natural language processing tasks.
- Image Analytics: For processing and analyzing images.
- Time Series: For analyzing sequential data.

	Name	Version	Action
☑	Orange3	3.38.0	
☐	Associate	1.3.0	
☐	Bioinformatics	4.8.4	
☐	Educational	0.8.0	
☐	Explain	0.6.10	
☐	Fairness	1.0.1	
☐	Geo	0.5	
☐	Image Analytics	0.13.0	
☐	Network	1.10	
☐	Prototypes	0.21.2	

	Name	Version	Action
☐	Prototypes	0.21.2	
☐	Pumice	1.0	
☐	Single Cell	1.7.2	
☐	Spectroscopy	0.7.2	
☐	Survival Analysis	0.6.1	
☐	Text	1.16.1	
☐	Textable	3.1.11	
☐	Timeseries	0.6.3	
☐	World Happiness	0.1.12	
☐	SNOM	0.0.4	





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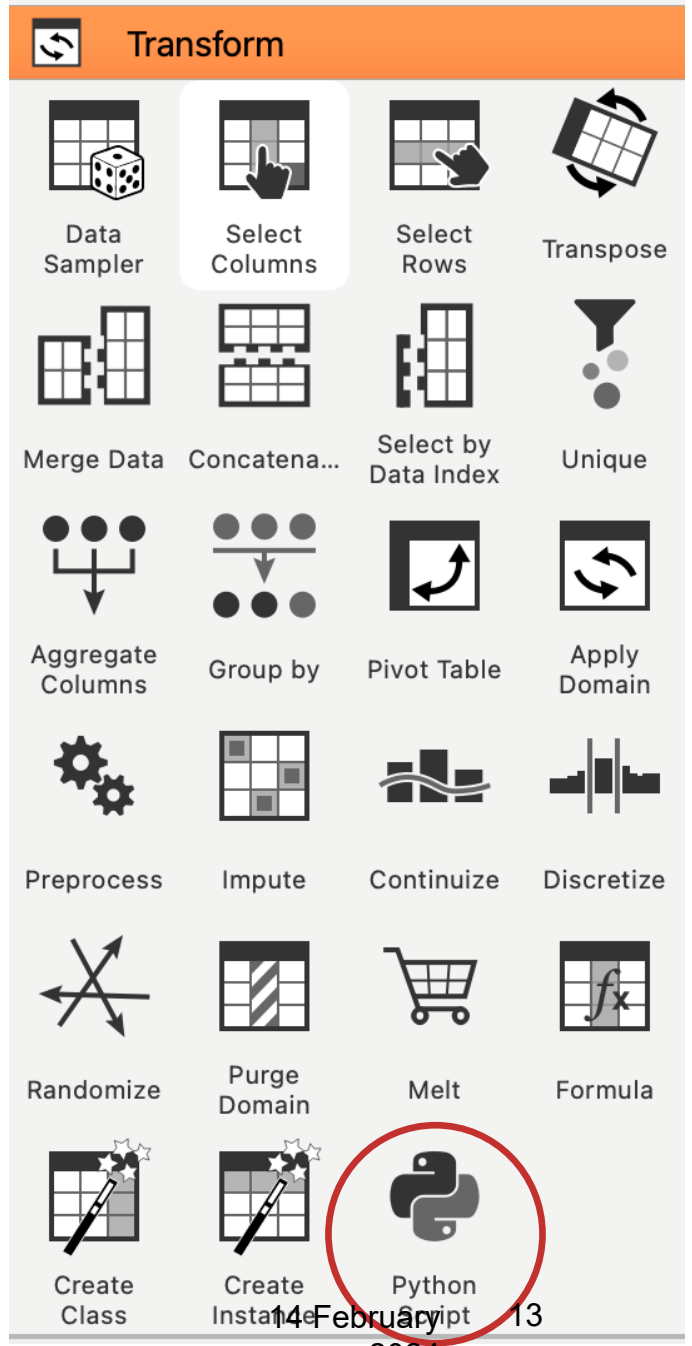
Core Libraries in Orange

- **NumPy and SciPy:** For numerical and scientific computing.
- **Scikit-learn:** Backend for machine learning algorithms.
- **Matplotlib:** For visualization support.

Comparison with other Low code /No code tools

- Compared to **KNIME** and **RapidMiner,** Orange focuses on simplicity.
- More user-friendly than **Weka** for beginners.
- Less flexible than Python libraries like **Scikit-learn.**



Thank you very much for your attention!

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