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# JMP INTRO TUTORIAL FOR ENGINEERS AND SCIENTISTS

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# GETTING STARTED WITH JMP® SOFTWARE

- JMP is ideal for **reshaping, exploring and analyzing** ad hoc data as an engineer
  - [https://www.jmp.com/en\\_us/home.html](https://www.jmp.com/en_us/home.html)
  - [https://www.sas.com/en\\_us/software/viya.html](https://www.sas.com/en_us/software/viya.html)
- Widely used in various industries – Pharma, Semiconductors, Consumer Goods etc.
- Recommended over Excel® and Python for exploratory analysis and visualization
  - Ease-of-use suited for fast-paced and thorough analysis
  - Designed with thoughtful combo of statistics and visuals describing data
  - JMP guides to good statistical practices for non-statisticians



# DOWNLOADING TUTORIAL FILES

- Download tutorial materials from Github repository:  
[https://github.com/jlandgre/JMP\\_Intro\\_Tutorial](https://github.com/jlandgre/JMP_Intro_Tutorial)
- Github: Good for engineers to know! It's common for sharing open-source materials like this tutorial
- Github repositories can be open (like this one) or private

The screenshot shows a GitHub repository page for 'JMP\_Intro\_Tutorial'. The repository is public and has 1 branch and 0 tags. The main file listed is 'readme.md'. On the right side, there is a 'Code' dropdown menu (marked with a red circle and number 1), a 'Clone' section with 'HTTPS', 'SSH', and 'GitHub CLI' options, and a 'Download ZIP' button (marked with a red circle and number 2). The page also includes a brief description of the repository and the date it was last updated.

**JMP\_Intro\_Tutorial** Public

main 1 branch 0 tags

jlandgre Initial Commit

images	Initial Commit
.gitignore	Initial Commit
JMP_Intro.pptx	Initial Commit
LICENSE	Initial Commit
readme.md	Initial Commit

Local Codespaces

Clone

HTTPS SSH GitHub CLI

[https://github.com/jlandgre/JMP\\_Intro\\_Tutorial](https://github.com/jlandgre/JMP_Intro_Tutorial)

Use Git or checkout with SVN using the web URL.

Open with GitHub Desktop

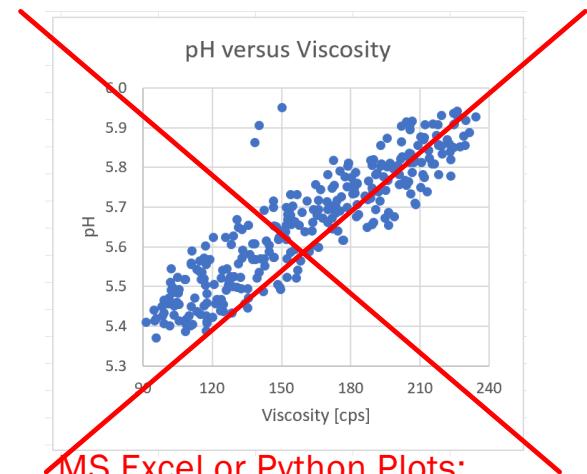
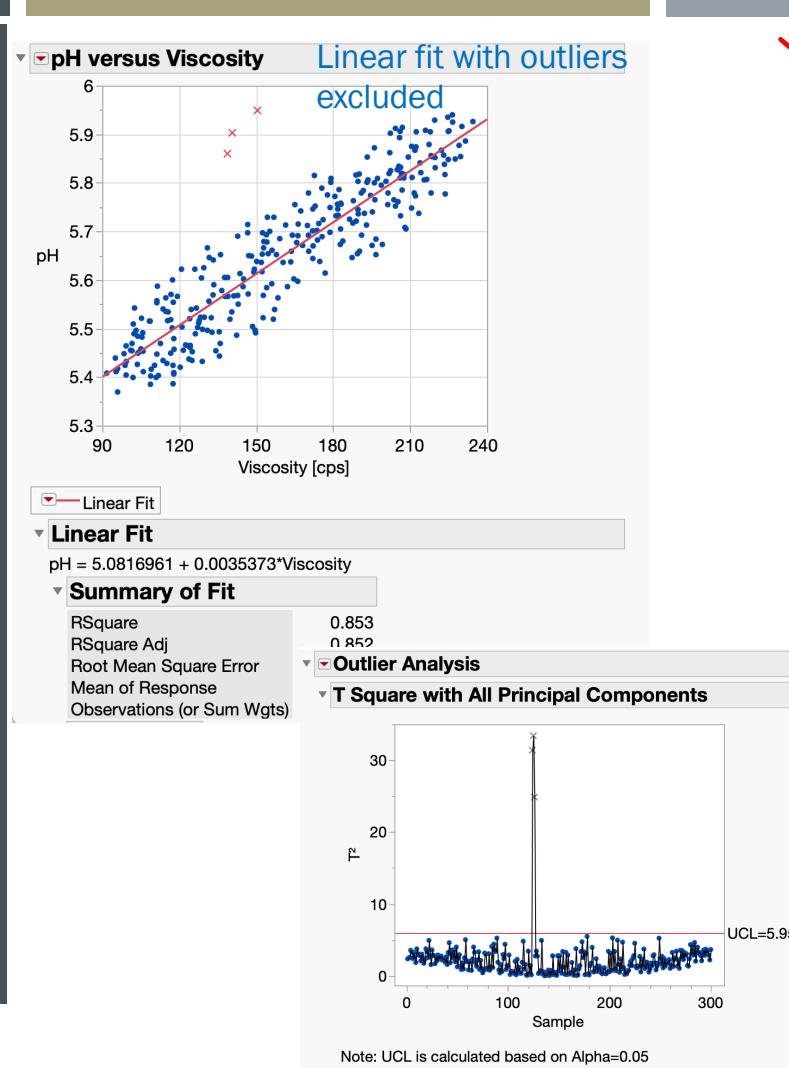
readme.md

Download ZIP

This repository contains a getting-started tutorial for JMP(R) software.  
See the \*.pptx files for the slides.  
J.D. Landgrebe, August 2023

## WHY JMP?

- Easy-to-use data reshaping tools
- Combine stats and visuals
- Guidance on use of stats
- Ability to explore subsets of data
- Training resources ([jmp.com/learn](http://jmp.com/learn))



- MS Excel or Python Plots:
- No stats built in
  - Hard to explore fit omitting outliers
  - Stats expertise needed to perform outlier analysis in Python/SciKit Learn

Are outliers abnormal  
combo of pH and  
viscosity? [Yes! T<sup>2</sup> outliers  
Significant with p<0.05 ]



## JMP GETTING STARTED TOPICS

This customized tutorial covers:

- Why JMP?
- Installation and accessing tutorials that come with the install
- Opening files and performing basic analyses
- Data selection, Column info and Data Types
- Accessing JMP tutorials for additional topics

# ACCESSING BUILT-IN TUTORIALS

- Installation also installs references and resources for learning
- As an exercise, launch JMP, choose the Help menu and browse what's there
- Take the 5-minute Beginners Tutorial to get a feel for how JMP works

The image shows the JMP Help menu and the "Beginner's Tutorial" window. The Help menu is open, showing options like JMP Help, Search JMP, JMP Documentation Library, Discovering JMP, New Features, Quick Reference Card, Menu Card, Sample Data Folder, JMP on the Web, Tutorials, Tip of the Day, Statistics Index, Scripting Index, and Sample Index. The "Tutorials" item is selected. The "Beginner's Tutorial" window is displayed, showing the first page of the tutorial. The title bar says "Beginner's Tutorial". The content area starts with a welcome message: "Welcome to JMP. Every new JMP user should take this five-minute tutorial on the user-interface basics of JMP." It also includes instructions: "Please move windows around during the tutorial so that you can see everything that is happening." A section titled "Exercise 1: Opening Outlines" with the sub-instruction "Click the gray disclosure icon next to the 'Outline Item' title bar below." A callout box highlights the "Outline Item" section. At the bottom of the window are "End Tutorial" and "Next" buttons.

Welcome to JMP. Every new JMP user should take this five-minute tutorial on the user-interface basics of JMP.

Please move windows around during the tutorial so that you can see everything that is happening.

**Exercise 1: Opening Outlines**

Click the gray disclosure icon next to the 'Outline Item' title bar below.

▶ **Outline Item**

End Tutorial      Next

▶ **Beginners Tutorial**

- One Mean Tutorial
- Two Means Tutorial
- Many Means Tutorial
- Paired Means Tutorial
- Two-Way ANOVA
- Graph Builder Tutorial
- Beginning Join
- Matched Join
- Stack Columns
- DOE Tutorial
- Partition Tutorial

# OPENING DATA FILES

- JMP can open various formats (\*.xlsx, \*.csv, Google Sheets etc.)
- JMP Home (Window / JMP Home) shows recent files
- Exercise: Open the Example\_Data.jmp file

The screenshot shows the JMP software interface. On the left, there is a dark sidebar with the title "OPENING DATA FILES". The main area displays the "JMP Home" window, which includes a "Recent Files" list and a "Windows" section. A red box highlights the "Recent Files" list, which contains items like "Example\_Data", "Example\_Data\_Model", "Example JMP Data", "Drug Measurements....", "Financial.jmp", "Fitness.jmp", "case\_study\_1000bat...", "case\_study1.xlsx", "case\_study1\_formula...", and "df\_weekly\_grp\_means". To the right of the JMP Home window, a context menu is open from the "Window" menu. This menu lists options such as "Minimize", "Zoom", "Move Window to Left Side of Screen", "Move Window to Right Side of Screen", "Replace Tiled Window", "Move to Built-in Retina Display", "Move to J.D.'s iPad (2)", "Hide", "Hidden", "Set Report Title", "JMP Starter", "Log", "JMP Home" (which is highlighted with a red box), "Show Data Table", "Combine Windows...", and "Move to Front Project". Below the context menu, a data table titled "Example\_Data" is visible, showing columns for "Batch", "Sample", "Viscosity", and "pH". The data table contains 300 rows of batch measurements.

	Batch	Sample	Viscosity	pH
1	batch_2023_001	1	110.4	5.424
2	batch_2023_001	2	99.4	5.432
3	batch_2023_001	3	106	5.411
4	batch_2023_002	1	96	5.369
5	batch_2023_002	2	111	5.399
6	batch_2023_002	3	101.1	5.455
7	batch_2023_003	1	111.9	5.403
8	batch_2023_003	2	109.1	5.416
9	batch_2023_003	3	111.3	5.447
10	batch_2023_004	1	108.8	5.385
11	batch_2023_004	2	91.8	5.408
12	batch_2023_004	3	95.1	5.439
13	batch_2023_005	1	95.4	5.411
14	batch_2023_005	2	104.3	5.451
15	batch_2023_005	3	108.9	5.402
16	batch_2023_006	1	98.9	5.424
17	batch_2023_006	2	118	5.457
18	batch_2023_006	3	103.7	5.426



## OPENING FILES AND CONDUCTING BASIC ANALYSES

- Opening files
- Performing basic analyses with Example\_Data.jmp
  - Distributions of data
  - Fit Y by X to look at combination of variables
  - Summarizing data

# DATA TABLE WINDOW

- Panes contain data table info
- Unlike spreadsheet, variable name is not “first row”
- Row state summary is helpful especially with large data tables

Nominal  
(categorical)  
variable

Continuous  
(numerical)  
variables

Row state  
summary

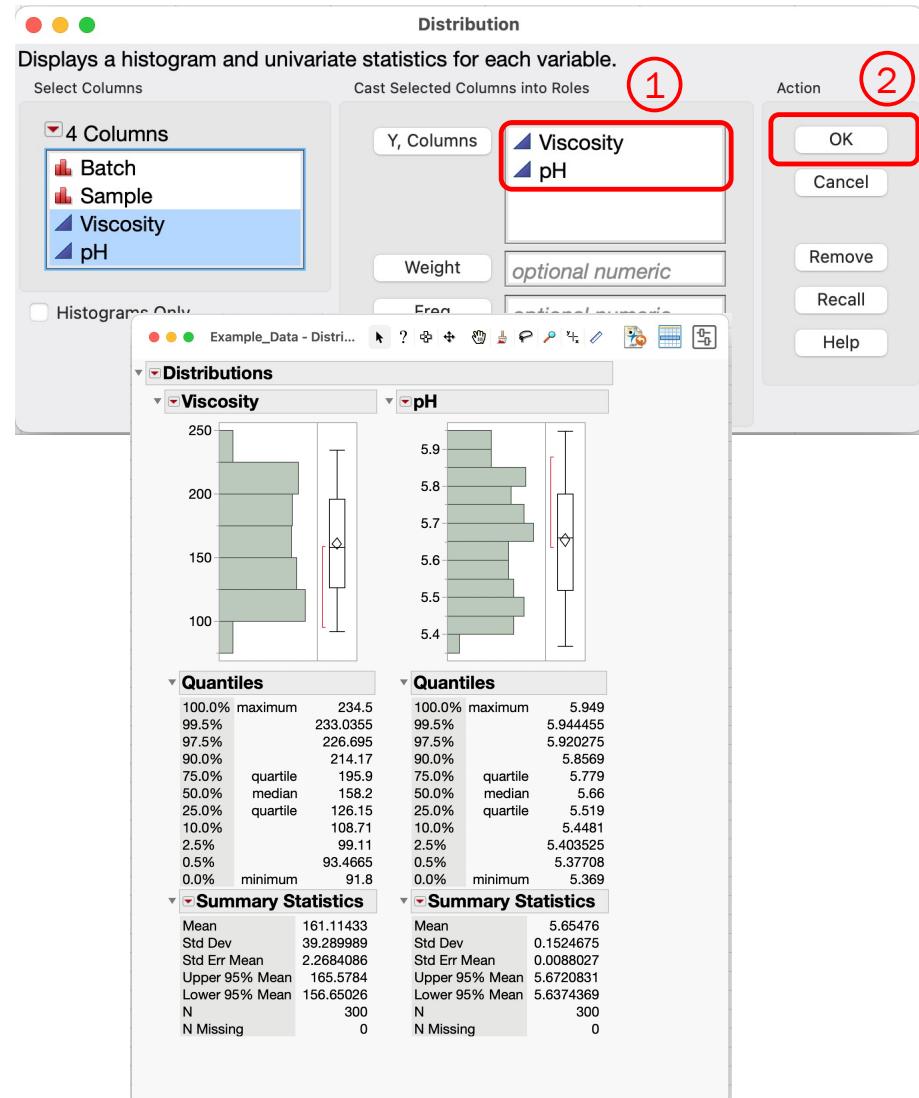
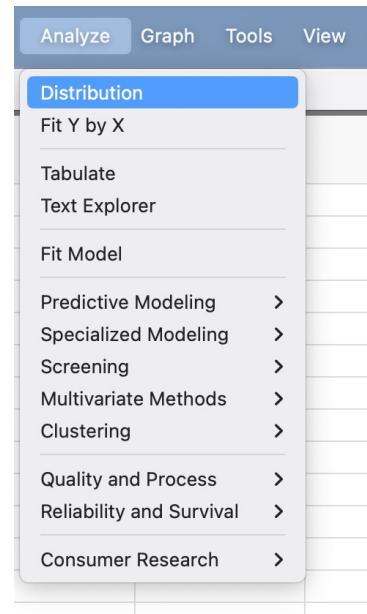
Click here to clear  
row and column  
selections

Variable names

Batch	Sample	Viscosity	pH
1 batch_2023_001	1	110.4	5.424
2 batch_2023_001	2	99.4	5.432
3 batch_2023_001	3	106	5.411
4 batch_2023_002	1	96	5.369
5 batch_2023_002	2	111	5.399
6 batch_2023_002	3	101.1	5.455
7 batch_2023_003	1	111.9	5.403
8 batch_2023_003	2	109.1	5.416
9 batch_2023_003	3	111.3	5.447
10 batch_2023_004	1	108.8	5.385
11 batch_2023_004	2	91.8	5.408
12 batch_2023_004	3	95.1	5.439
13 batch_2023_005	1	95.4	5.411
14 batch_2023_005	2	104.3	5.451
15 batch_2023_005	3	108.9	5.402
16 batch_2023_006	1	98.9	5.424
17 batch_2023_006	2	118	5.457
18 batch_2023_006	3	102.7	5.426

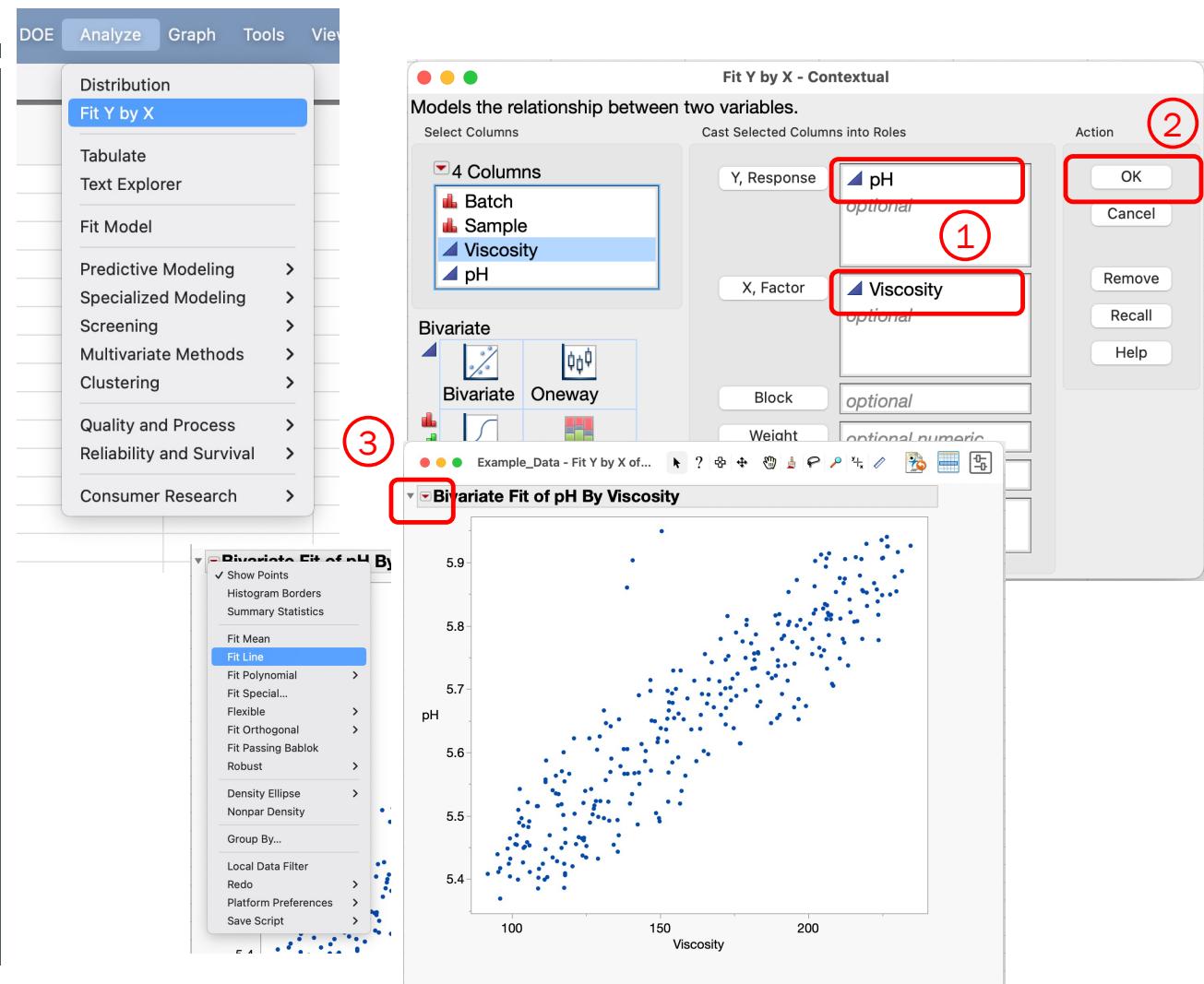
# BASIC ANALYSES (DISTRIBUTION OF DATA)

- Analyze menu has available analyses
- Choose Analyze / Distribution to view distributions and stats for Viscosity and pH data
- Drag variables to Y, Columns box and click OK button



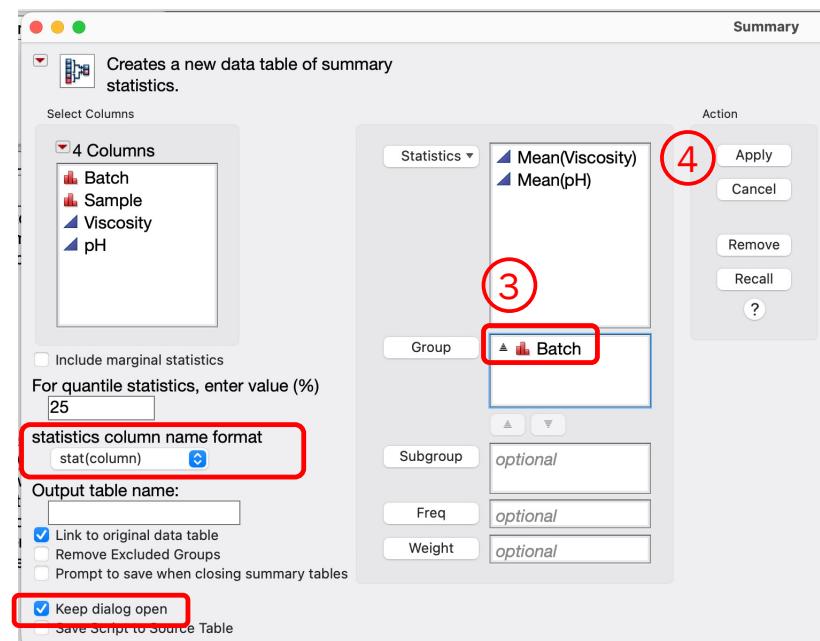
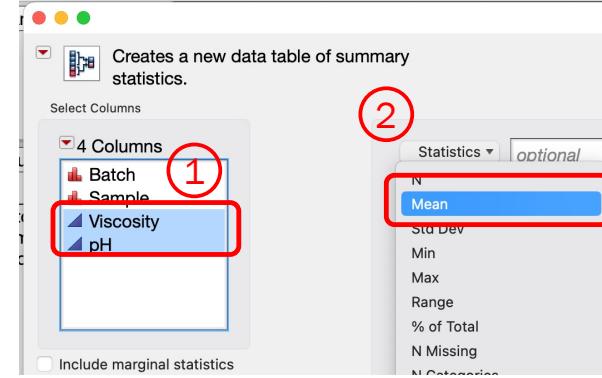
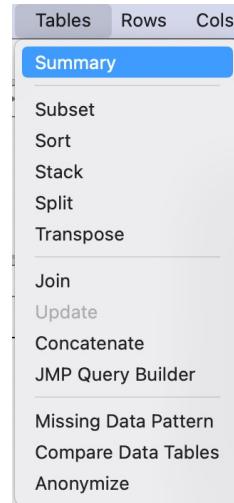
# BASIC ANALYSES (FIT Y BY X)

- Analyze menu has available analyses
- Choose Analyze / Fit Y by X to create a scatterplot with Viscosity and pH data
- Red arrow menu has analysis and fitting options



# BASIC ANALYSES (SUMMARIZE BY)

- Tables menu has available summary and data reshaping actions
- Choose Tables / Summary to get averages by Batch
- Helpful options for customizing
  - statistics column name format
  - Keep dialog open
- Use “Apply” button once satisfied with Summary preview



# BASIC ANALYSES (SUMMARIZE BY)

- Summary generates a JMP data table (Optionally linked to original data)
- Use Column Info to customize number formats etc.
- Use Edit menu/Copy with Column Names (or Save As) to transfer across applications

JMP  
Summary  
by Batch

The screenshot shows the JMP interface with a summary table and a copy dialog box.

**JMP Summary by Batch:**

Batch	N Rows	Mean(Viscosity)	Mean(pH)
1 batch_2023_001	3	105.3	5.42
2 batch_2023_002	3	102.7	5.41
3 batch_2023_003	3	110.8	5.42
4 batch_2023_004	3	98.6	5.41
5 batch_2023_005	3	102.9	5.42
6 batch_2023_006	3	106.9	5.44
7 batch_2023_007	3	113.3	5.43
8 batch_2023_008	3	116.0	5.43
9 batch_2023_009	3	107.4	5.43
10 batch_2023_010	3	108.6	5.46
11 batch_2023_011	3	109.2	5.45
12 batch_2023_012	3	108.3	5.43
13 batch_2023_013	3	105.6	5.45
14 batch_2023_014	3	131.2	5.46
15 batch_2023_015	3	135.3	5.47
16			
17			
18			
19			
20			
21			

**Edit Menu (Copy With Column Names selected):**

- Undo ⌘ Z
- Redo ⌘ ⌘ Z
- Cut ⌘ X
- Copy ⌘ C
- Copy With Column Names ⌘ C**
- Copy As Text ⌘ ⌘ C
- Paste ⌘ V
- Paste With Column Names ⌘ ⌘ V
- Delete
- Select All ⌘ A
- Search >
- Run Script ⌘ R
- Debug Script
- Submit to SAS ⌘ ⌘ R
- Journal ⌘ J
- Lock Journal
- Start Dictation ⌘ S
- Emoji & Symbols ⌘ Space

A large green arrow points from the "Copy With Column Names" option in the Edit menu to the JMP summary table.



## DATA SELECTION, COLUMN INFO AND DATA TYPES

- Basic data selection (manual clicking)
- Column Info to exclude, hide, color etc.
- Column Info Menu Item - access variable Properties
  - Switch a variable's data type
  - Other useful variable properties
- Other data selection techniques

# SELECTING DATA

- Can independently select rows and columns
- Row State shows how rows are treated on plots and analyses
- As an exercise
  - Copy/paste the three highlighted cells into another application such as a word processor
  - Select Rows 8 and 9 and use Rows menu to unexclude them

Click (or shift-Click) to select Row(s)

Click here to clear row and column selections

Click (or shift-Click) to select Column(s)

	Batch	Sample	Viscosity
•	1 batch_2023_001	1	110
•	2 batch_2023_001	2	99
•	3 batch_2023_001	3	100
•	4 batch_2023_002	1	98
•	5 batch_2023_002	2	111
•	6 batch_2023_002	3	101
•	7 batch_2023_003	1	111
• 	8 batch_2023_003	2	109
• 	9 batch_2023_003	3	111
•	10 batch_2023_004	1	108

Excluded rows

Row State info: Color for graphing, Selected status, Excluded status etc.

## PROPERTIES OF VARIABLES (EXAMPLE: DATA TYPE)

- JMP defaults numeric data to be Continuous data type (blue triangle icon)
- Sample should be treated as Nominal –it's a categorical not a numeric
- Right-click on Sample column heading and choose Column Info

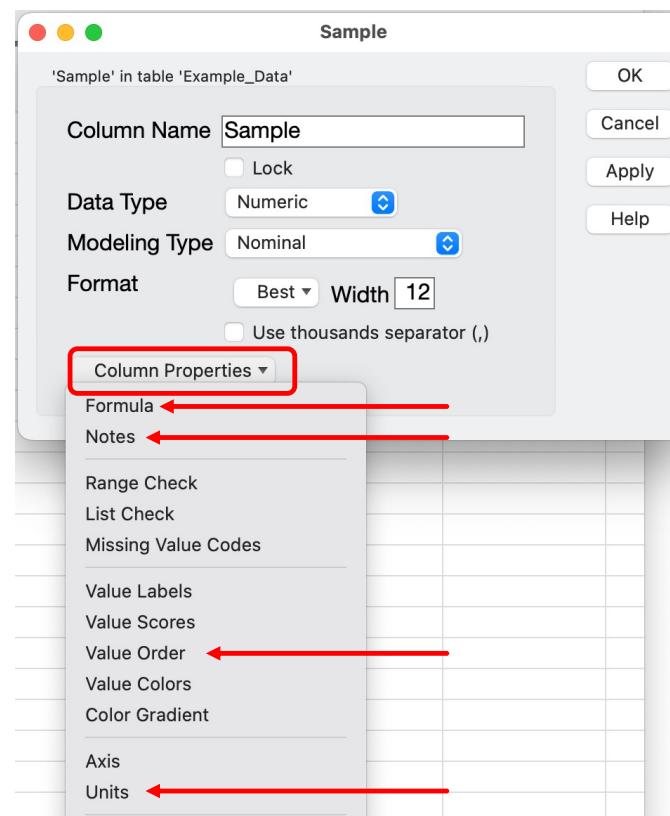
Right/Control-Click and choose Column Info

The screenshot shows the JMP interface with the 'Example\_Data' table open. The 'Sample' column is selected, and a context menu is displayed with the 'Column Info...' option highlighted. Below this, the 'Data Type' dropdown is open, showing 'Nominal' as the selected option. Other options include 'Continuous', 'Ordinal', 'Multiple Response', 'Unstructured Text', 'Vector', and 'None'. The table data includes columns for 'Batch' (containing 1 through 7) and 'Sample' (containing batch\_2023\_001 through batch\_2023\_003).

Select “Nominal” to treat Sample as categorical instead of numeric

# PROPERTIES OF VARIABLES

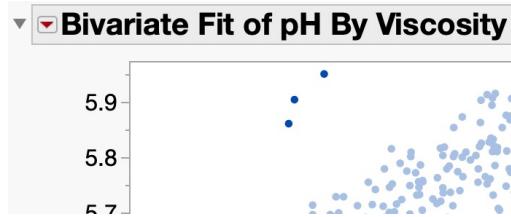
- In Column Info, Column Properties is comprehensive metadata about a variable
- Formula property lets you create calculated variables
- Notes and Units properties curate variable's description
- Value Order controls categorical order on plots (Example: you want plot order to be “Begin, Middle, End” instead of alphabetical)



# OTHER DATA SELECTION TECHNIQUES

- Data can be selected visually on graphs using the Lasso tool or by clicking on points
- Rows / Row Selection menu
  - **Select Where** criteria-based selection
  - **Invert Row Selection** helpful for working with Excluded/Hidden Row State
- Control/Right-Click Select Matching Cells in data table

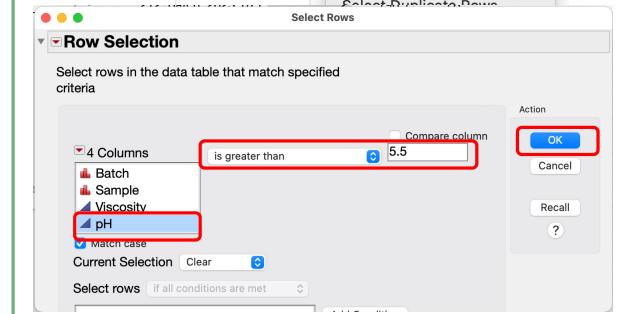
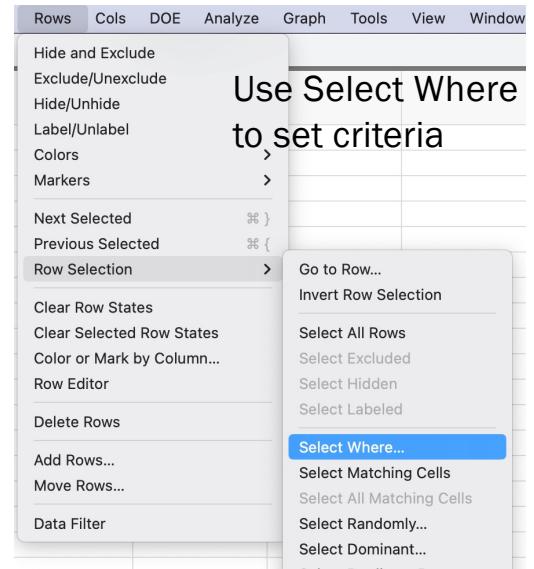
Click on points or use lasso tool to select data rows manually

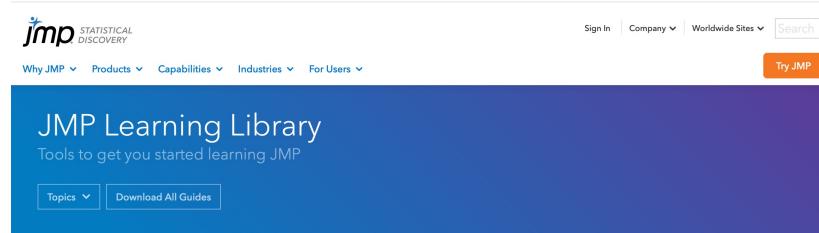


Right/Control-click on cell(s) to select all matching rows  
[Example: select all Sample=1 rows]

A screenshot of a data table with columns: Batch, Sample, Viscosity, and pH. The first row is selected. A context menu is open over the first row, with the "Select Matching Cells" option highlighted.

Batch	Sample	Viscosity	pH
207 batch_2023_069	3	191	5.779
208 batch_2023_070			
209 batch_2023_070			
210 batch_2023_070			
211 batch_2023_071			
212 batch_2023_071			
213 batch_2023_071			
214 batch_2023_072			
215 batch_2023_072			
216 batch_2023_072			
217 batch_2023_072			





The screenshot shows the JMP Learning Library homepage. At the top, there's a navigation bar with links for 'Sign In', 'Company', 'Worldwide Sites', and a search bar. Below the header, a main title 'JMP Learning Library' is displayed with the subtitle 'Tools to get you started learning JMP'. There are two buttons: 'Topics' and 'Download All Guides'. A sub-section titled 'JMP Basics' lists various topics like 'Opening JMP and Getting Started', 'Sharing Results on JMP Public', etc.

Learning JMP is easy with our quick overviews, videos, and step-by-step tutorials.

#### JMP Basics

- Opening JMP and Getting Started
- Navigating JMP in Windows
- Importing Text Files
- Importing Data from Excel
- JMP Tables Menu
- JMP Tools
- Creating Formulas in JMP
- Saving JMP Results
- Sharing Results on JMP Public
- Excel Add In I (Passing Data to JMP)
- Excel Add In II (Profiling Excel Models in JMP)



This screenshot shows a specific tutorial page under the 'JMP Learning Library'. The title is 'Correlation and Regression'. It provides a brief description of what the topic covers: exploring relationships between variables and building statistical models. Below the description, there are four main sections: 'Correlation', 'Nonparametric Correlations', 'Simple Linear Regression', and 'Stepwise Regression', each with a brief description and a link to more information.

## Correlation and Regression

Learn how to explore relationships between variables. Build statistical models to describe the relationship between an explanatory variable and a response variable. Test for statistical significance to determine those variables that most correlate with an outcome from those that do not, using resulting model to describe these relationships and make predictions. Learn an automated model fitting algorithm to determine a model that best describes the features in the data.

- **Correlation**  
Visualize the relationship between two continuous variables and quantify the linear association via Pearson's correlation coefficient.
- **Nonparametric Correlations**  
Produce nonparametric measures of association between two continuous variables (Spearman's Rho, Kendall's Tau, and Hoeffding's D).
- **Simple Linear Regression**  
Model the bivariate relationship between a continuous response variable and a continuous explanatory variable.
- **Stepwise Regression**  
Perform automated variable selection in multiple linear or logistic regression models.
- **Simple Logistic Regression**  
Model the relationship between a categorical response variable and a continuous explanatory variable.
- **Multiple Logistic Regression**  
Model the relationship between a categorical response variable and two or more continuous or categorical explanatory variables.

## JMP ONLINE TUTORIALS AS NEEDED FOR ADDITIONAL TOPICS

- See [jmp.com/learn](http://jmp.com/learn) for additional high-quality tutorials on topics from basic to advanced
- Tutorials are in PDF and video formats and use sample data from JMP's Help menu