

JMP INTRO TUTORIAL FOR ENGINEERS

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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.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
- 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 (circled with red number 1), a 'Clone' section with 'HTTPS' selected (circled with red number 2), and a 'Download ZIP' button.

JMP_Intro_Tutorial Public

main 1 branch 0 tags

Go to file Add file ↗ Code

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

Use Git or checkout with SVN using the web URL.

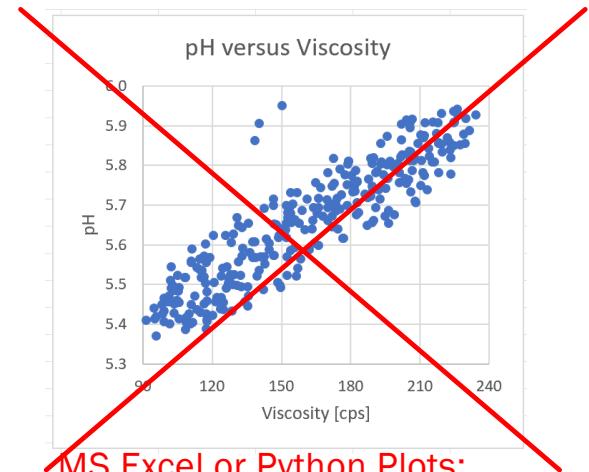
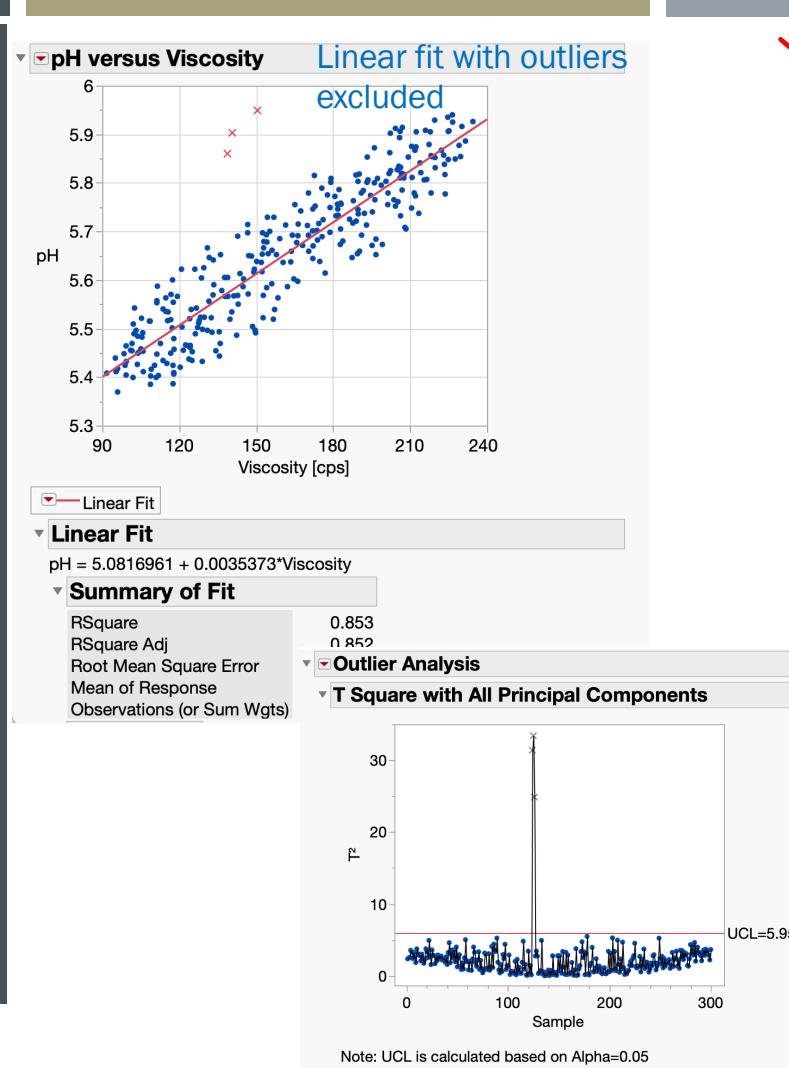
Open with GitHub Desktop

readme.md

Download ZIP

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)



- 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! T² 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



INSTALLATION

- Add U. of Delaware specific instructions

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

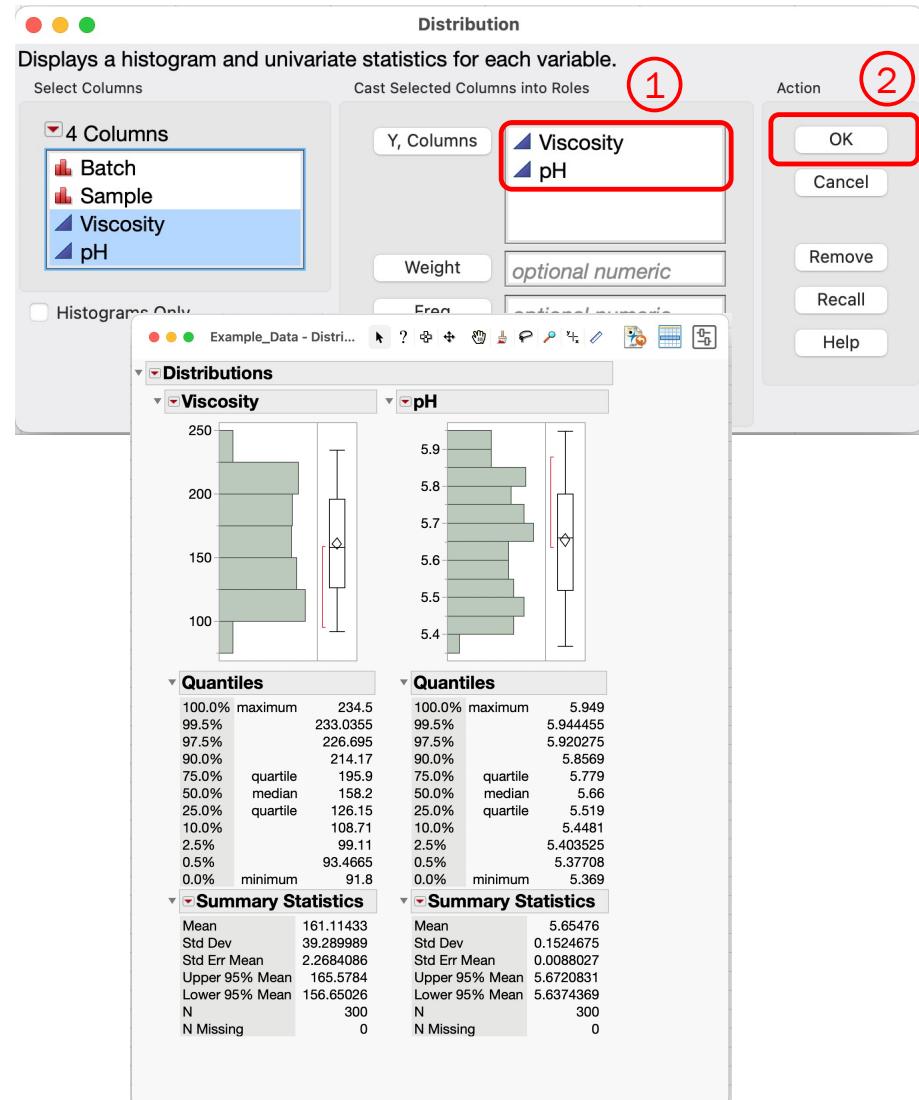
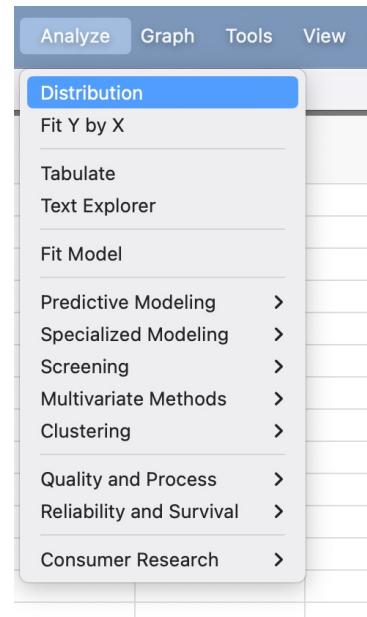
Click here to clear
row and column
selections

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

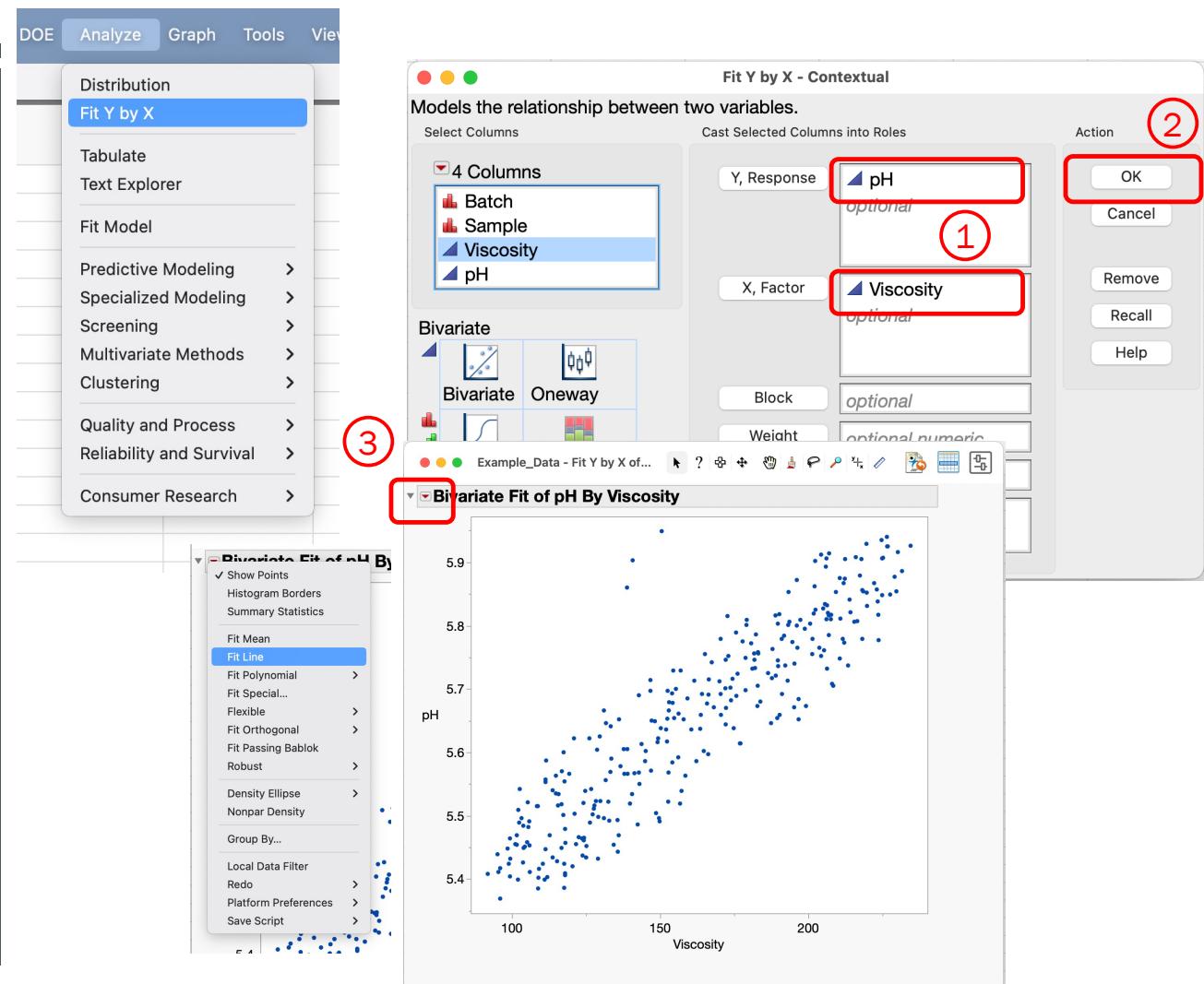
BASIC ANALYSES (DISTRIBUTION OF DATA)

- 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



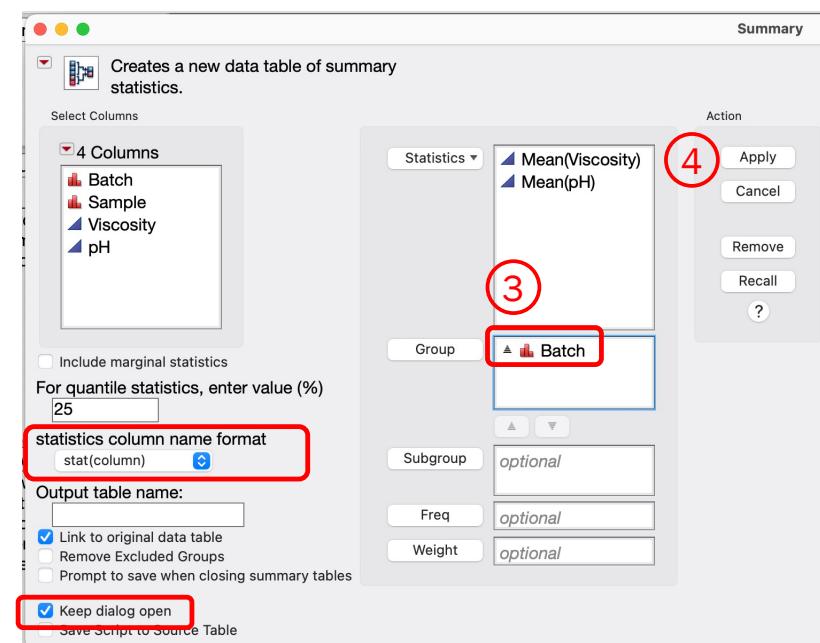
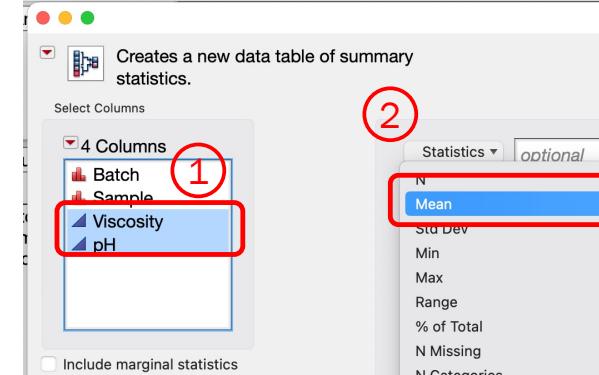
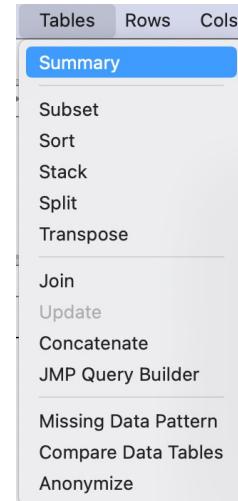
BASIC ANALYSES (FIT Y BY X)

- 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 image shows two windows from the JMP software. The top window is titled "Example_Data By (Batch)" and displays a summary table with columns: Batch, N Rows, Mean(Viscosity), and Mean(pH). The bottom window is an Excel spreadsheet titled "Book1 - E..." showing the same data. A large green arrow points from the JMP window to the Excel window, indicating the transfer of data.

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 batch_2023_016	3	111.7	5.5
17 batch_2023_017	3	118.2	5.48
18 batch_2023_018	3	123.1	5.48
19 batch_2023_019	3	117.4	5.5
20 batch_2023_020	3	113	5.51

JMP Column Info Window:

Column	Type	Format	Label
Batch	Text	General	Batch
N Rows	Text	General	N Rows
Mean(Viscosity)	Text	General	Mean(Viscosity)
Mean(pH)	Text	General	Mean(pH)

Excel Spreadsheet:

A	B	C	D
Batch	N Rows	Mean(Viscosity)	Mean(pH)
batch_2023_001	3	105.3	5.42
batch_2023_002	3	102.7	5.41
batch_2023_003	3	110.8	5.42
batch_2023_004	3	98.6	5.41
batch_2023_005	3	102.9	5.42
batch_2023_006	3	106.9	5.44
batch_2023_007	3	113.3	5.43
batch_2023_008	3	116.0	5.43
batch_2023_009	3	107.4	5.43
batch_2023_010	3	108.6	5.46
batch_2023_011	3	109.2	5.45
batch_2023_012	3	108.3	5.43
batch_2023_013	3	105.6	5.45
batch_2023_014	3	131.2	5.46
batch_2023_015	3	135.3	5.47
batch_2023_016	3	111.7	5.5
batch_2023_017	3	118.2	5.48
batch_2023_018	3	123.1	5.48
batch_2023_019	3	117.4	5.5
batch_2023_020	3	113	5.51



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

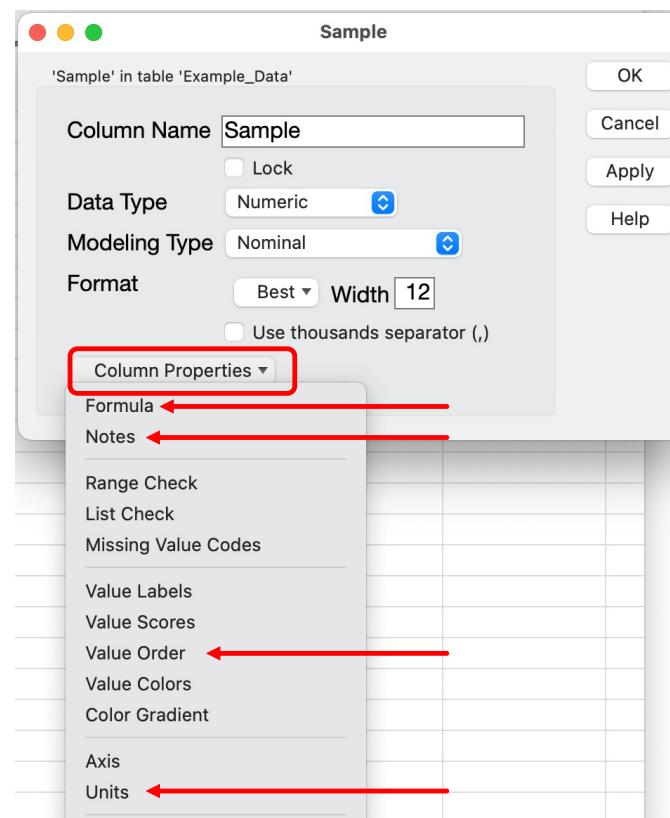
Right/Control-Click and choose Column Info

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' and 'Sample' with various entries like 'batch_2023_001' through 'batch_2023_003'.

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

PROPERTIES OF VARIABLES

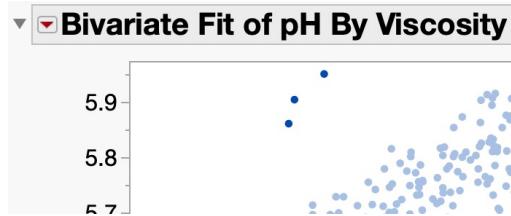
- In Column Info, Column Properties is comprehensive metadata about a variable
- Formula property lets you create calculated variables
- Notes and Units properties curate variable's description
- Value Order controls categorical order on plots (Example: you want plot order to be “Begin, Middle, End”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

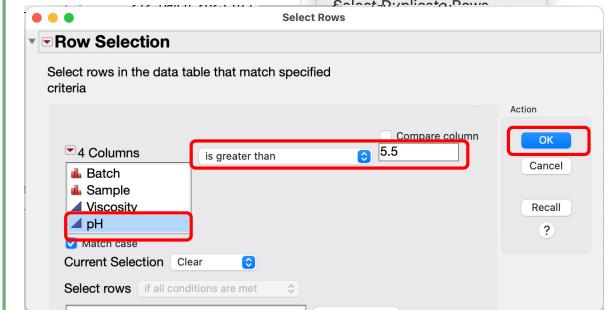
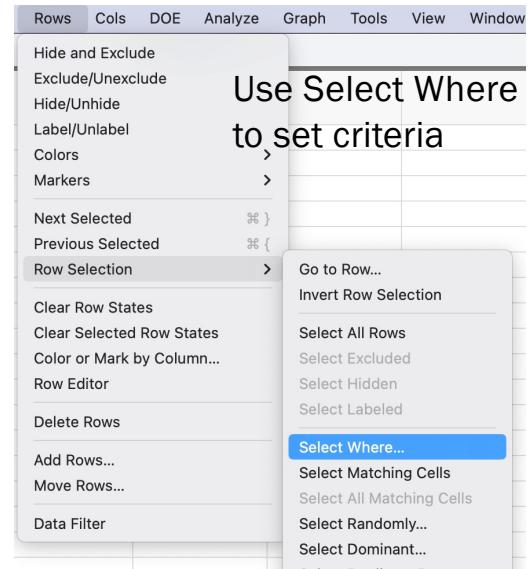
Click on points or use lasso tool to select data rows manually

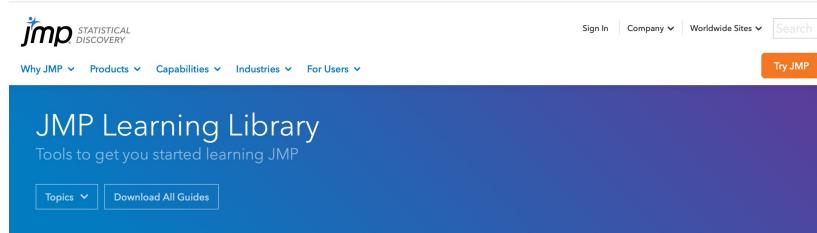


Right/Control-click on cell(s) to select all matching rows
[Example: select all Sample=1 rows]

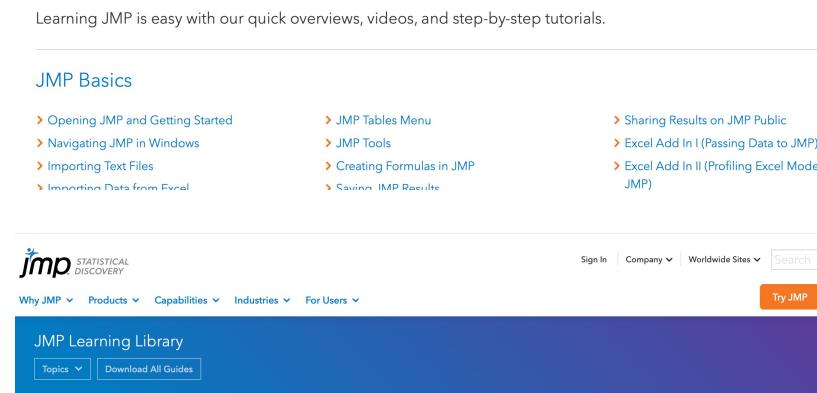
A screenshot of a data table with columns: Batch, Sample, Viscosity, and pH. The first row is selected. A context menu is open over the first row, with the "Select Matching Cells" option highlighted.

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 navigation is a main title 'JMP Learning Library' with a subtitle 'Tools to get you started learning JMP'. There are two buttons: 'Topics' and 'Download All Guides'. A large blue banner below the title contains the text 'Learning JMP is easy with our quick overviews, videos, and step-by-step tutorials.'.



This screenshot shows a specific page from the JMP Learning Library titled 'Correlation and Regression'. The page header includes the JMP logo and a 'Topics' button. The main content is titled 'Correlation and Regression' and describes how to explore relationships between variables. It lists several topics under this category, such as 'Correlation', 'Nonparametric Correlations', 'Simple Linear Regression', 'Simple Logistic Regression', 'Multiple Logistic Regression', and 'Stepwise Regression', each with a brief description and a link to more information.

JMP ONLINE TUTORIALS AS NEEDED FOR ADDITIONAL TOPICS

- See 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