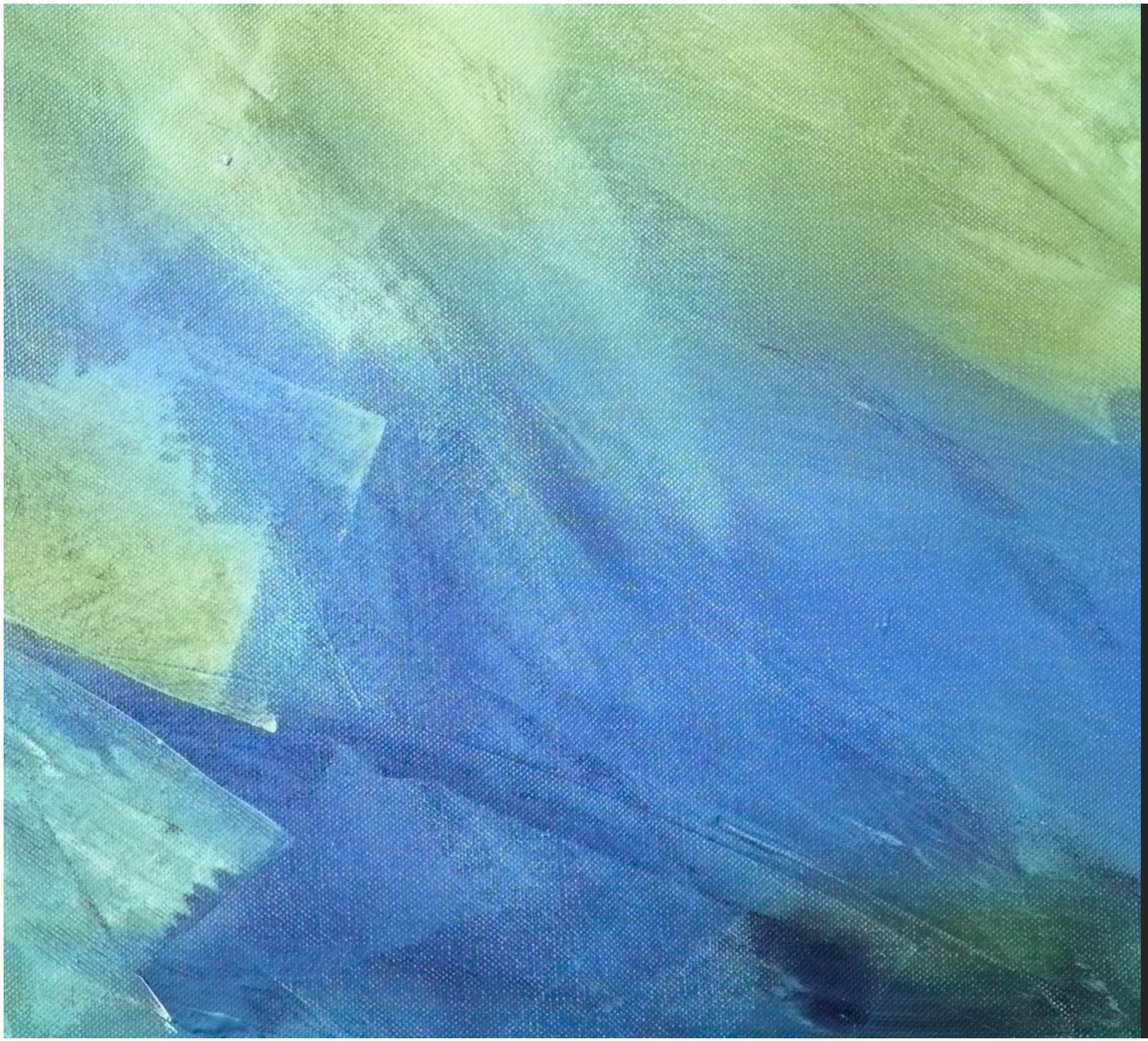


JMP INTRO FOR ENGINEERS

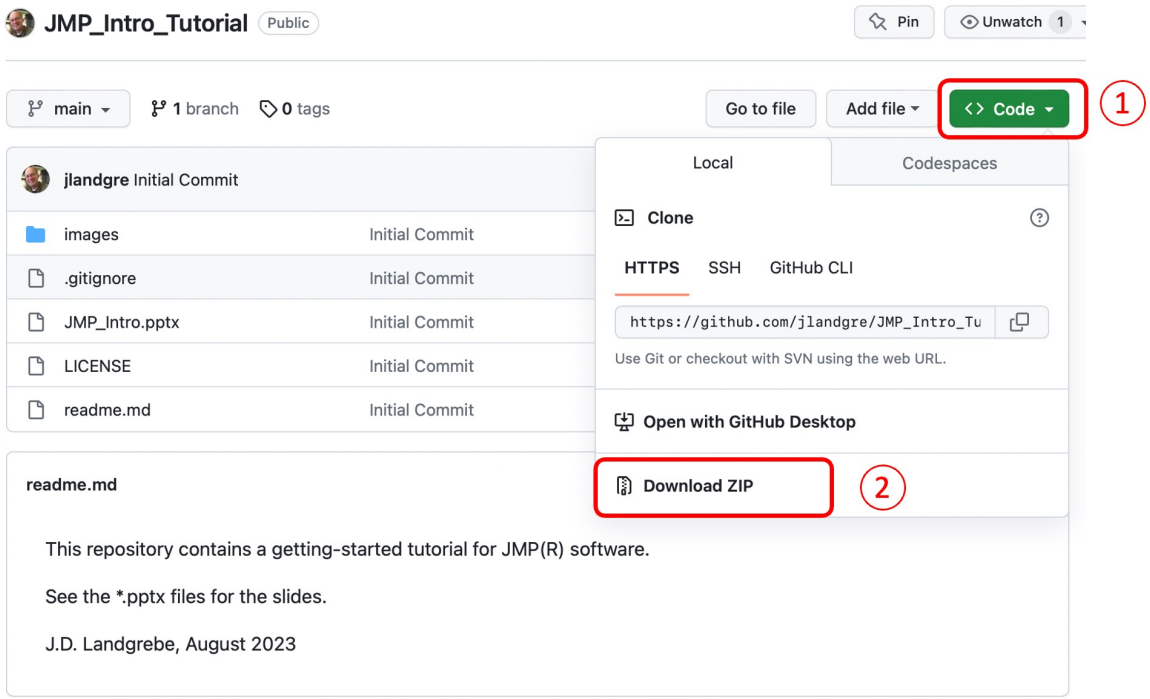
J.D. LANDGREBE
UNIVERSITY OF DELAWARE
CHEMICAL ENGINEERING

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 engineers
  - Designed with thoughtful combo of statistics and visuals describing data
  - JMP guides to good statistical practices for non-statisticians

DOWNLOADING TUTORIAL FILES

- Before starting with JMP, download our tutorial materials from this Github repository: https://github.com/jlandgre/JMP_Intro_Tutorial
- Github: Good for engineers to know! It's common way of sharing open-source materials this training package
- Github repositories can be open (like this one) or private



WHY JMP?

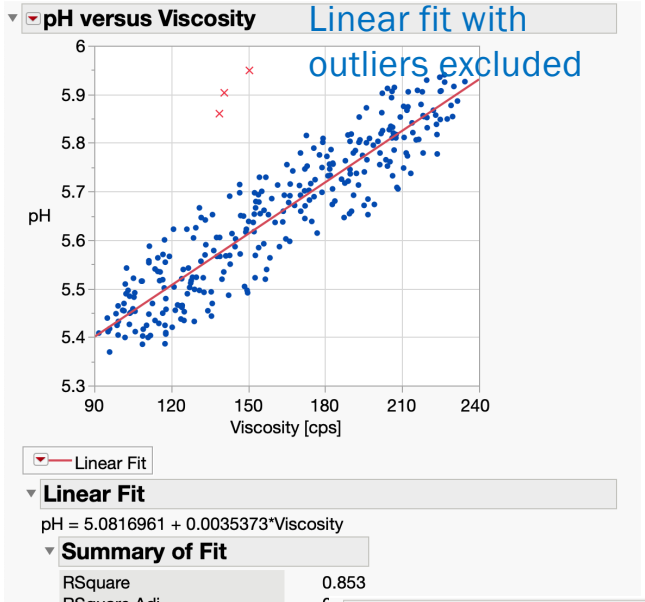
Easy-to-use data reshaping tools

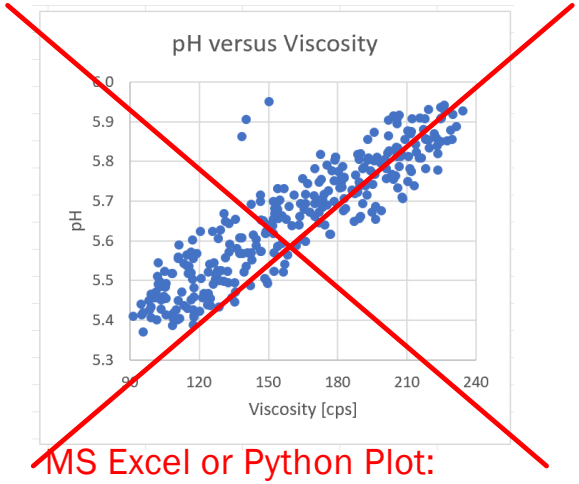
Combine stats and visuals

Guidance on use of stats

Ability to explore subsets of data

Training resources (jmp.com/learn)





MS Excel or Python Plot:

- No stats!
- Hard to explore fit omitting outliers
- [Considerable] stats expertise needed to perform outlier analysis in Python/SciKit Learn

Are outliers abnormal (significant aka $p<0.05$) combo of pH and viscosity? [Yes!]

JMP GETTING STARTED TOPICS

This customized tutorial goes with the great (and wide-ranging) tutorials that come with software install. We cover:

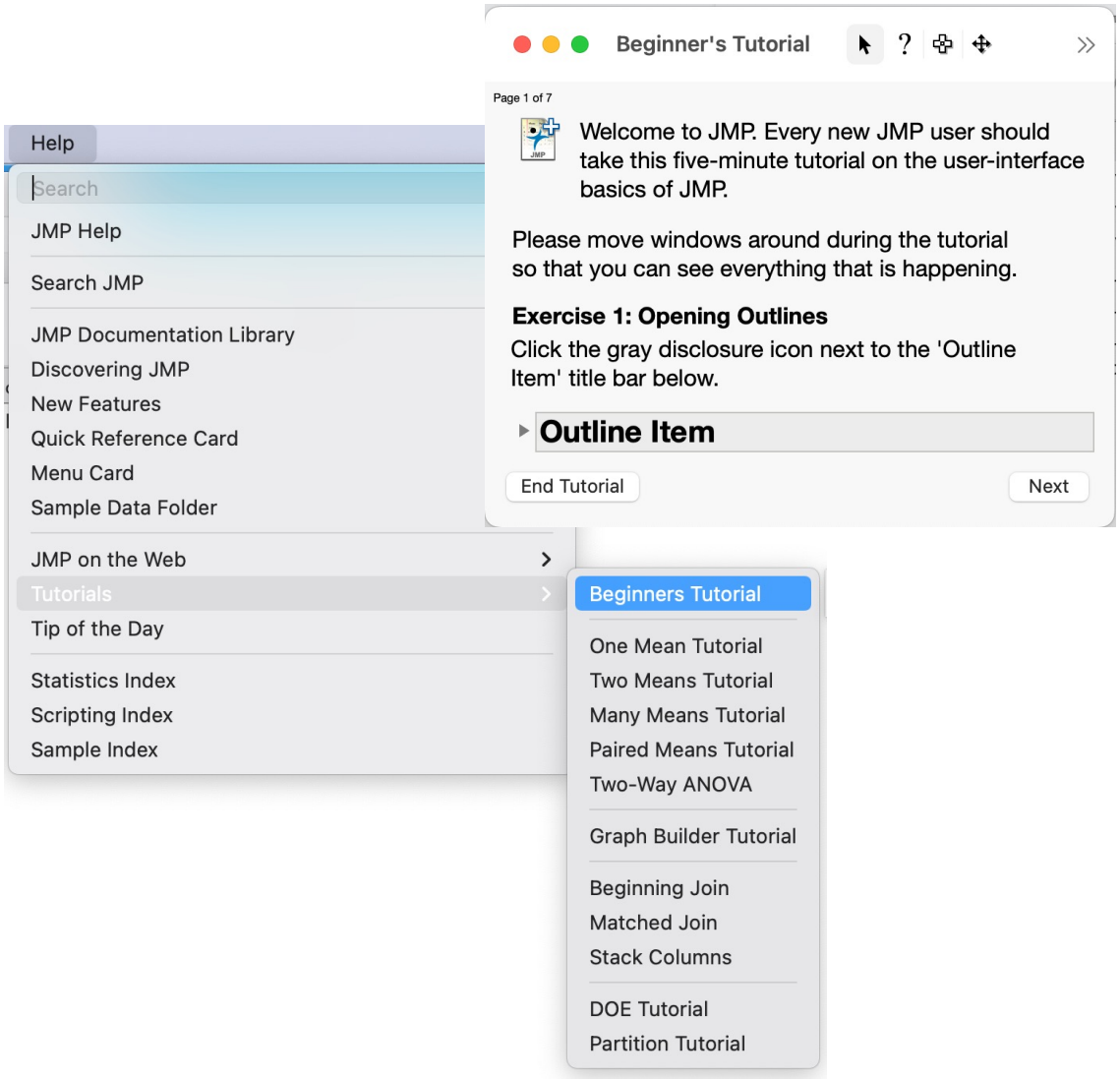
- Why JMP?
- Installation and accessing tutorials that come with the install
- Opening files and performing basic analyses
- Data selection, Column info and Data Types
- Data table operations and reshaping data
- Working with variables and basic analyses

INSTALLATION

- Add U. of Delaware specific instructions

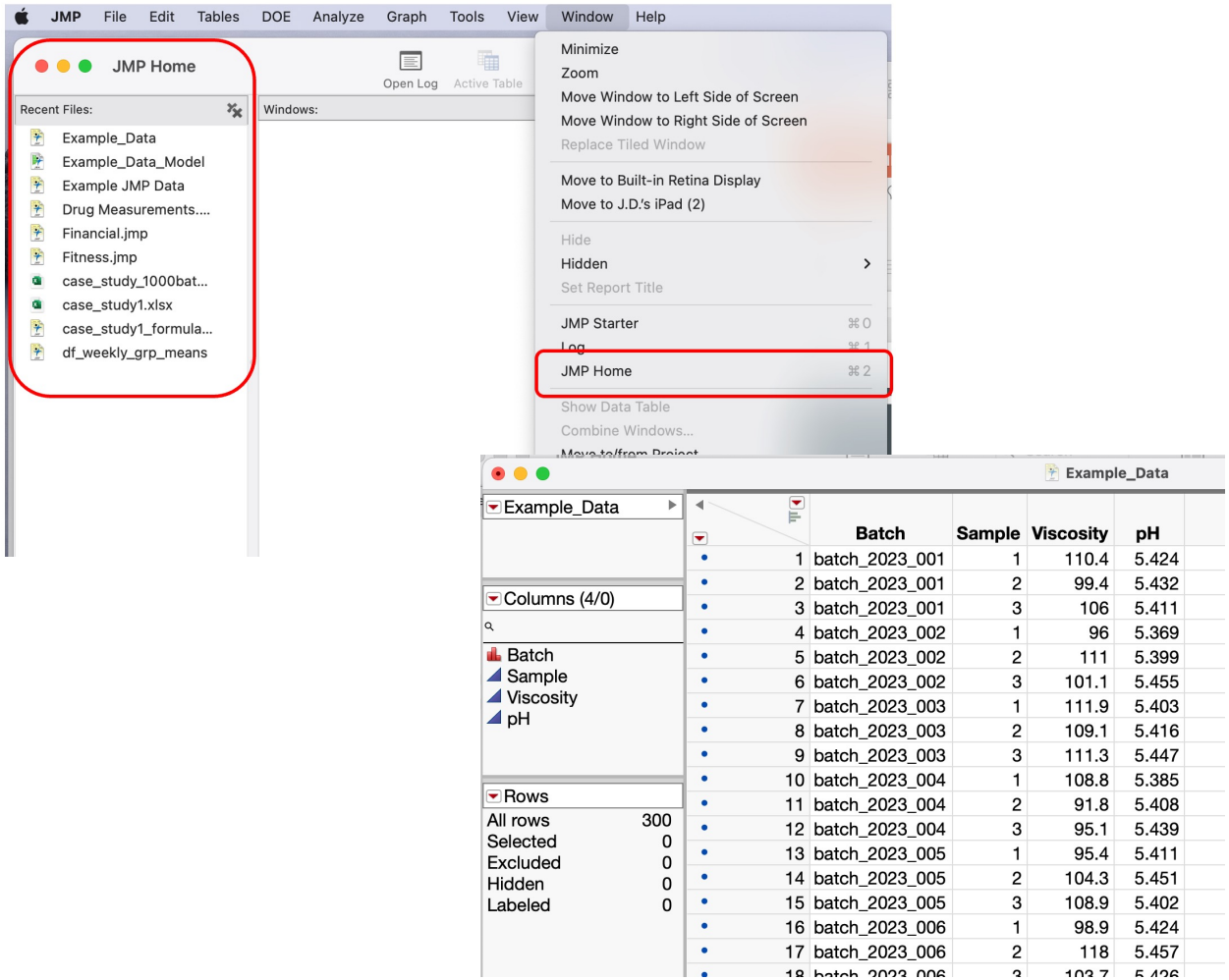
ACCESSING BUILT-IN TUTORIALS

- 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



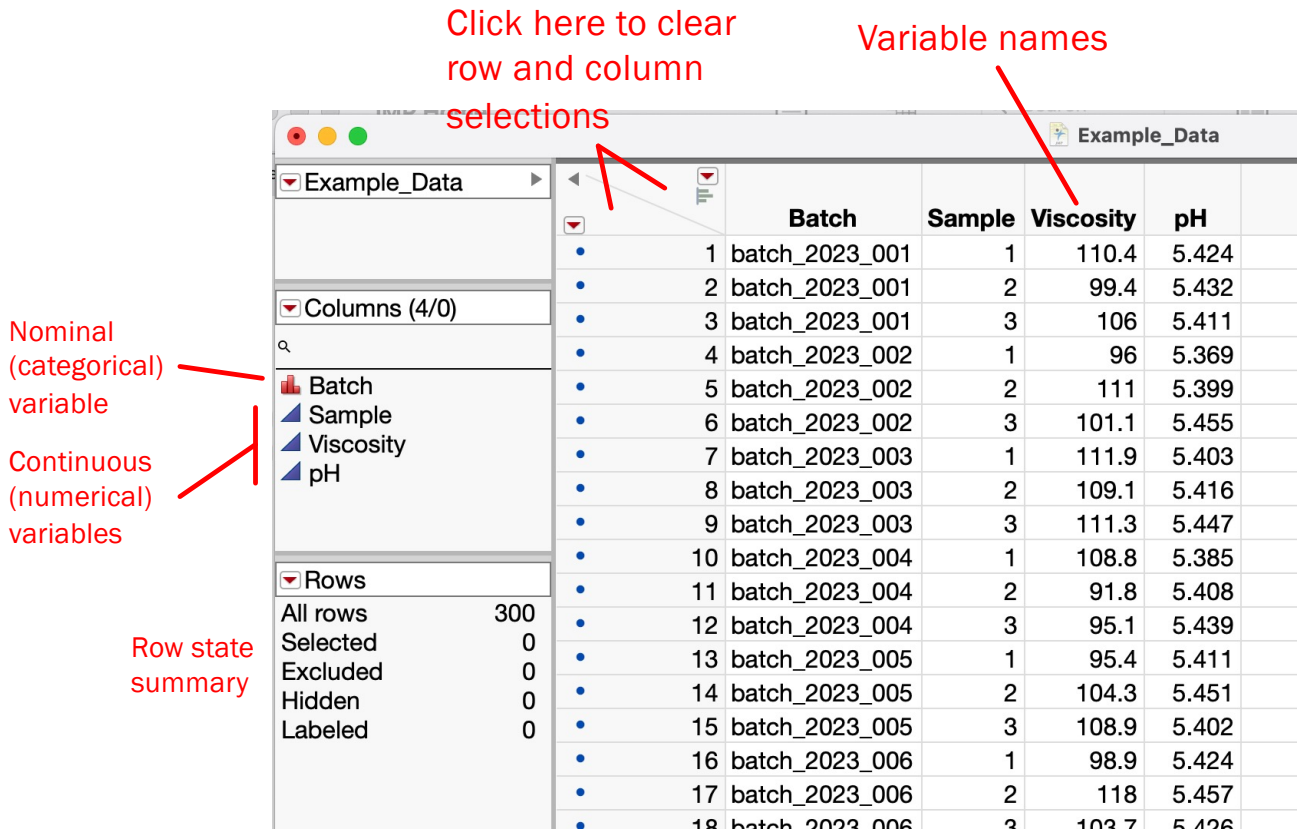
OPENING DATA FILES

- 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



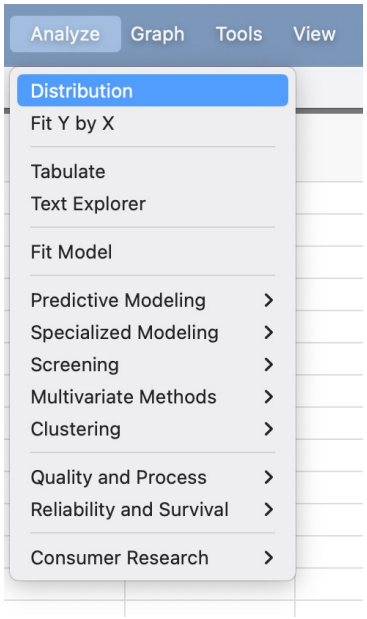
DATA TABLE WINDOW

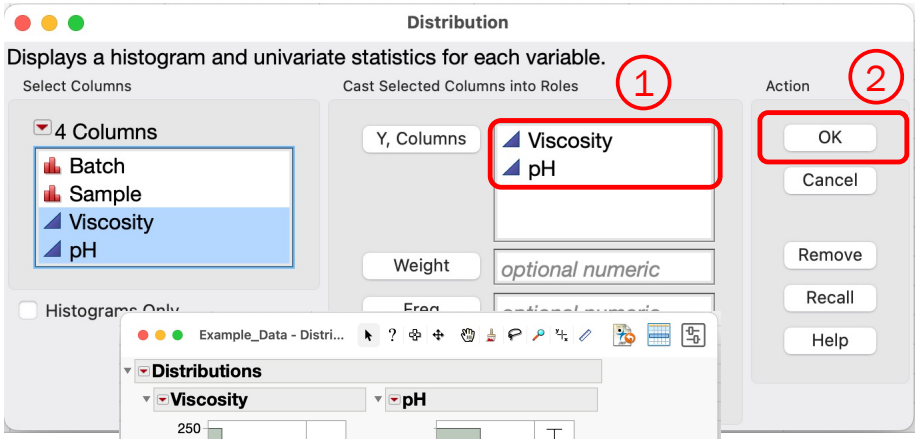
- Panes contain data table info
- Unlike spreadsheet, variable name is not “first row”
- Row state summary is helpful especially with large data tables

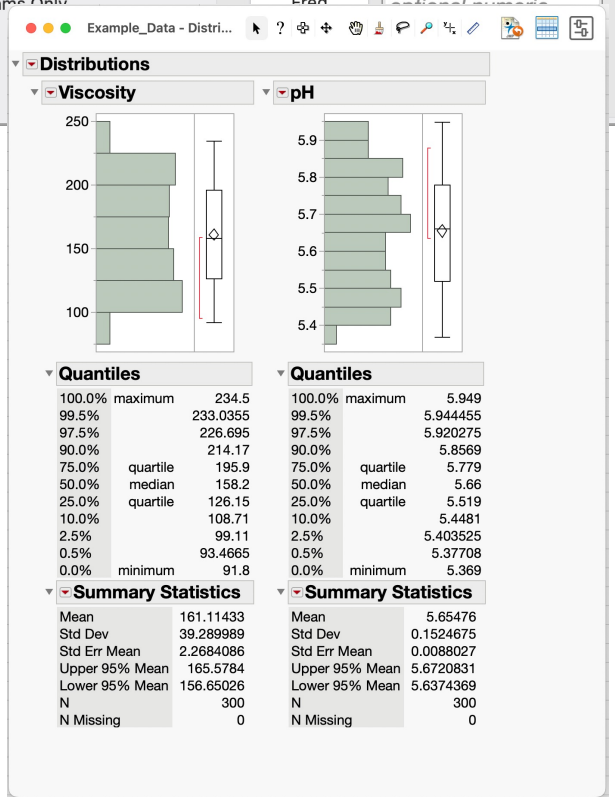


BASIC ANALYSES (DISTRIBUTION OF DATA)

- 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

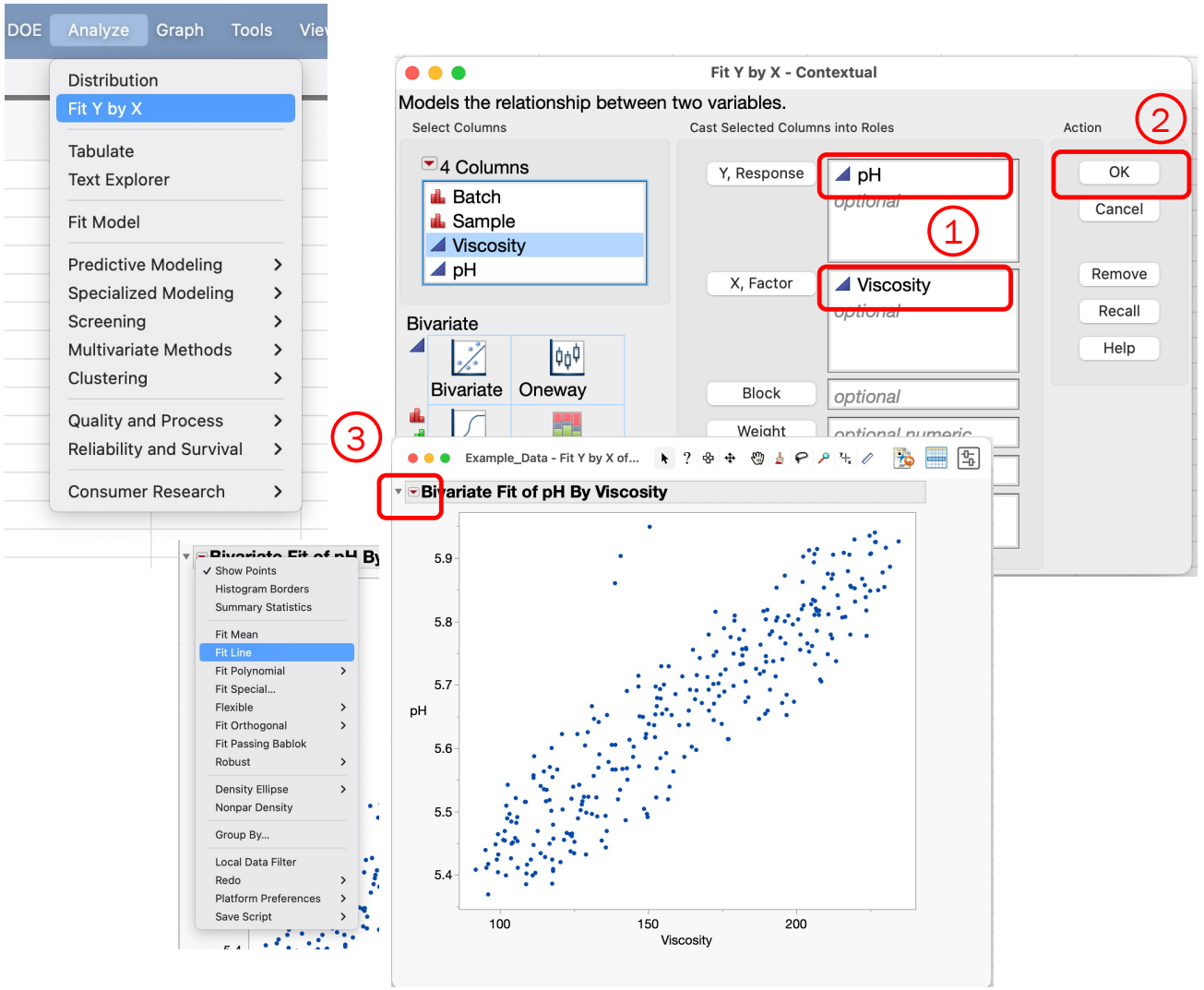






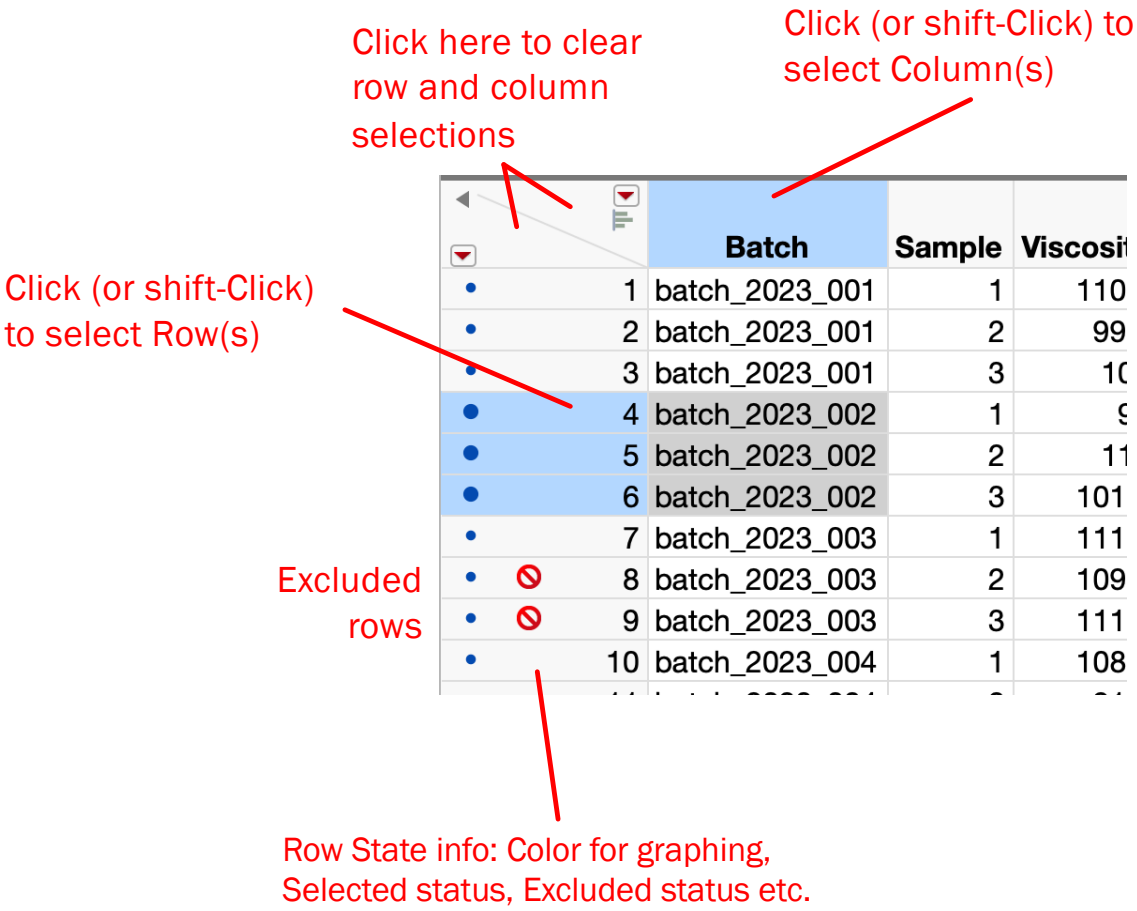
BASIC ANALYSES (FIT Y BY X)

- 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



SELECTING DATA

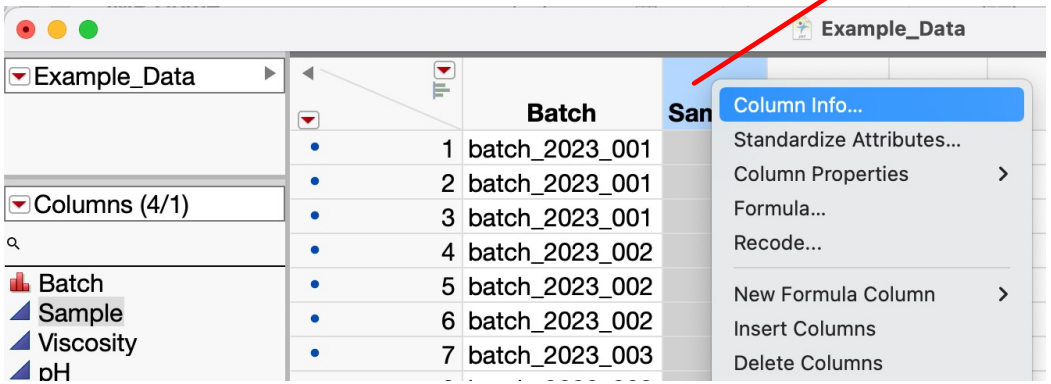
- Can independently select rows and columns
- Row State shows how rows are treated on plots and analyses
- As an exercise
  - Copy/paste the three highlighted cells into another application such as a word processor
  - Select Rows 8 and 9 and use Rows menu to unexcluded them



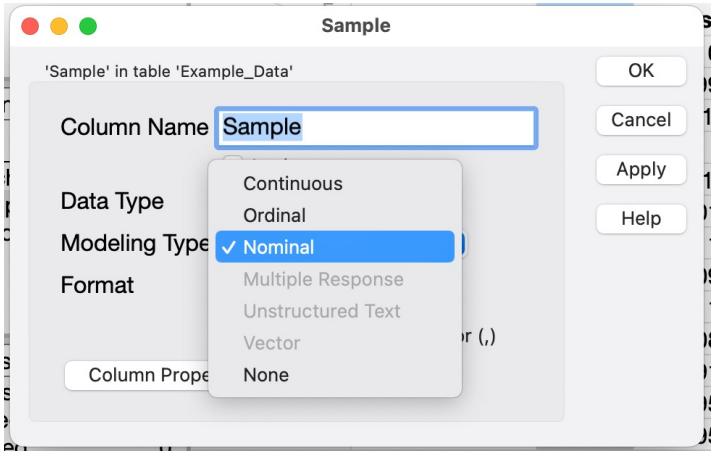
PROPERTIES OF VARIABLES (EXAMPLE: DATA TYPE)

- 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



Select "Nominal" to treat Sample as categorical instead of numeric



PROPERTIES OF VARIABLES

- In Column Info, Column Properties is a list of metadata you can set
- Formula property lets you create calculated variables
- Notes and Units properties curate a variable's description
- Value Order controls categorical variable order on plots (e.g. if you want plot order to be "Begin, Middle, End" instead of alphabetical)