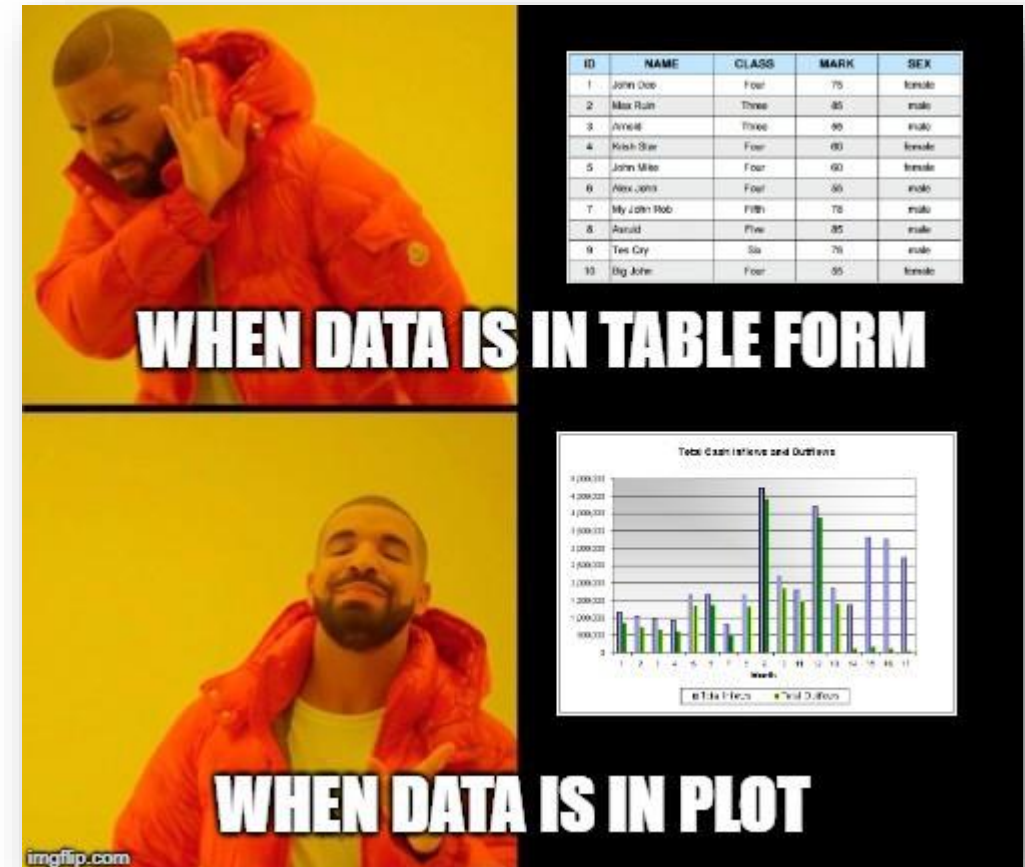


Figures, axes, subplots, get & set

# DATA VISUALIZATION

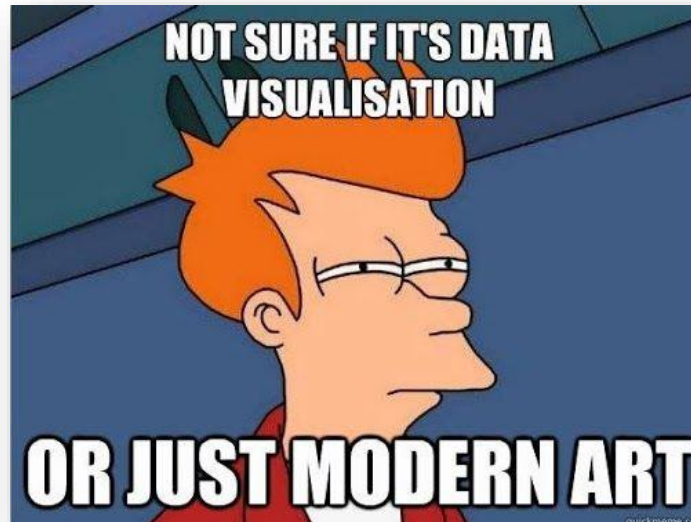


# Topics

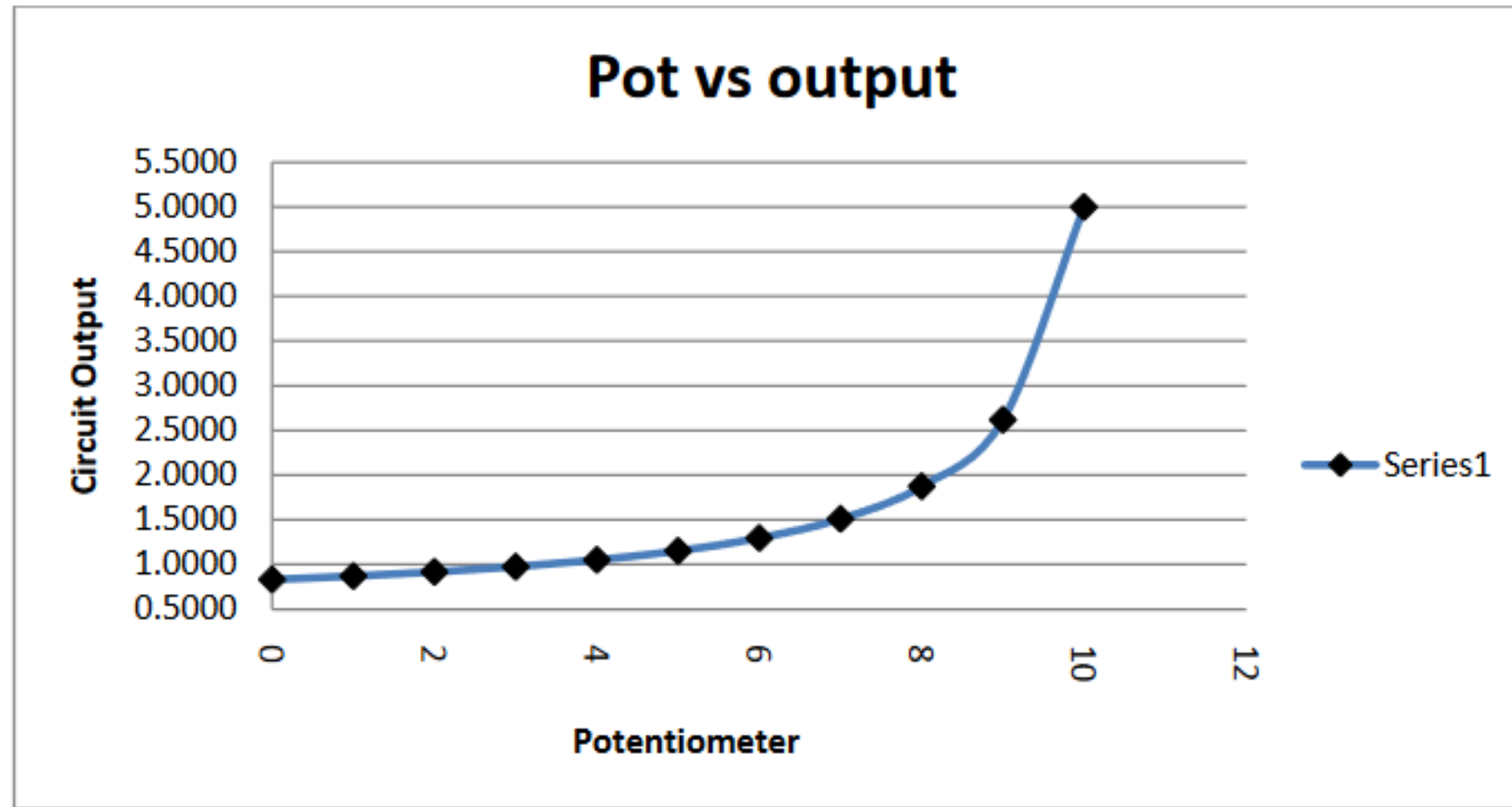
- Introduction: GUI and basic calculations
- Coding 1: Scripts, style, and variable classes
- Coding 2: Control statements and loops
- Visualization 1: Basics, subplots, get and set
- Coding 3: Functions
- Visualization 2: Descriptive plots
- Coding 4: Basic input and output
- Visualization 3: Distribution and 3D plots
- Coding 5: Input and output specials – last lecture before holidays
- Machine Learning 1: Introduction and dimension reduction
- Machine Learning 2: Clustering
- Machine Learning 3: Classification
- Coding 6: Efficiency and debugging basics
- Coding 7: Advanced functions and debugging

# Data Visualization

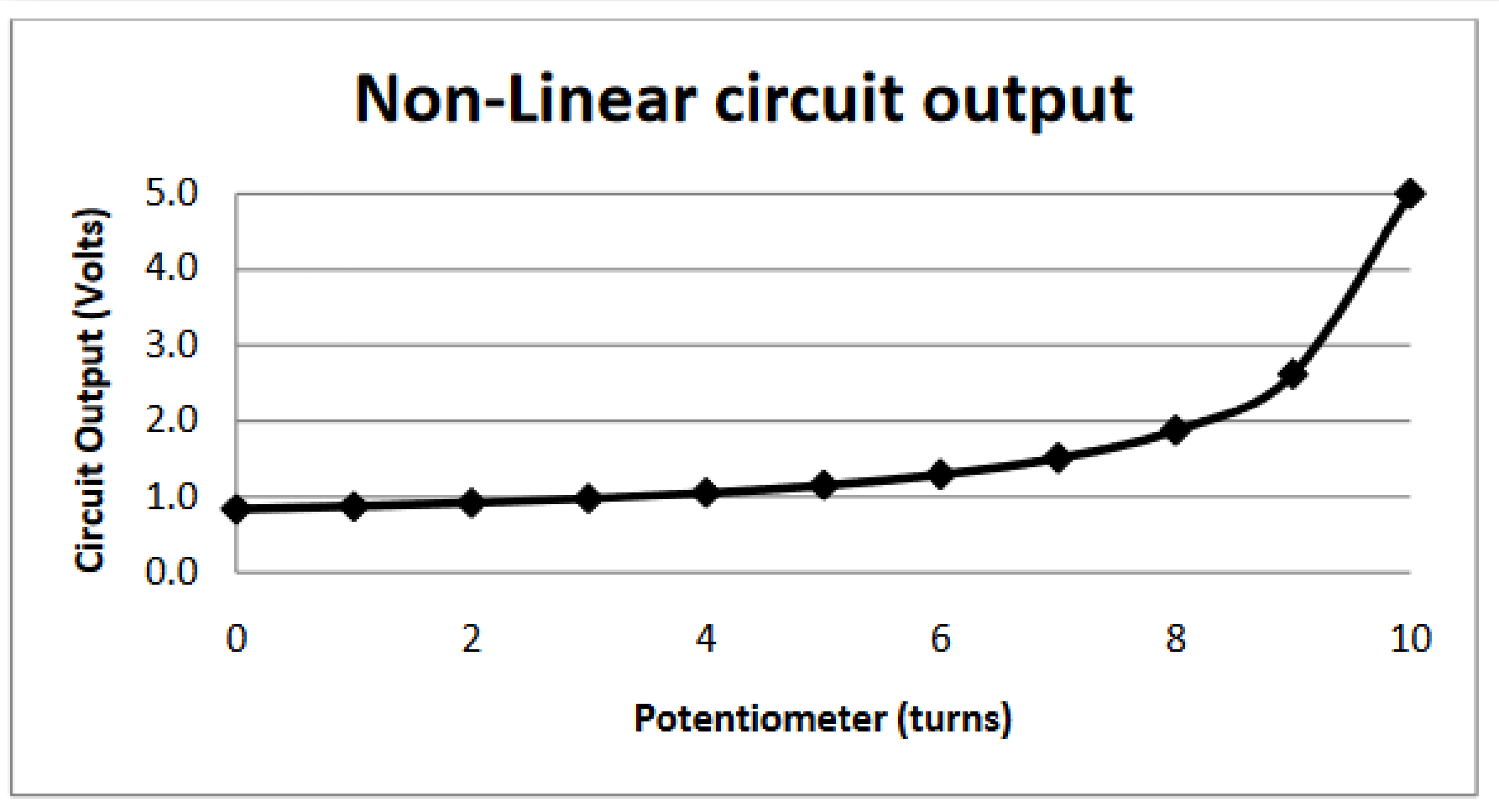
- Vital for data analysis
  - Can't be overstated
  - Humans are made to process images, so images we shall make!
  - Gives an impression of the data, finding outliers, strange behavior etc.
- Plotting data is a form of art, but there are some important factors
  - Meaningful title
  - Axes labels (units)
  - Meaningful scale
  - Font size!
  - Distinguishable lines
  - Legend/Colorscale if necessary



# Data Visualization Examples



# Data Visualization Examples



# Plotting

- Figure
  - Relevant optional arguments: (<number>, ,color', ,white')
  - Clf -> clear figure
  - Close -> surprise
- If you plot, you create axes in the figure and draw
  - Previous plots are overwritten, except when using „hold on“
  - Axes can be cleared with „cla“
- Multiple axes per figure are possible with subplot

# Get & Set

- Get & Set are standard ways to access data of objects in many programming languages
- MATLAB uses it mainly in the context of plotting
- Figures, axes in the figures, and plots in the axes have properties, these can be accessed and changed
  - `gca` = get current axes, `gcf` = get current figure
  - When creating a figure, axes or plots, you can also save handles to them
- With get and set, you can change all kinds of properties in your figure by code
  - You can also change these in the GUI, but then it's not reproducible