

# Original Proposed Content

**Title:** Effective Data Visualization for Actuaries

**Session Description:**

Actuaries often need to regularly communicate trends, diagnostics, and findings to stakeholders (other actuaries, their business partners, or clients).

Two questions arise:

- How do we create visualizations that let actuaries focus on interpreting rather than doing?
- How do we re-structure these visualizations to tell a better story?

In this session Brian and I will examine some common actuarial analysis problems (e.g. loss development, trend/inflation, mix shift exhibits, and model diagnostics) through the lens of visualization. Using R's ``ggplot2`` package, we'll show how these visualizations can be improved to better communicate the story. For example, reserve loss development can be manipulated with ``dplyr`` to show cumulative losses on the x-axis and incremental amounts on the y-axis to better highlight the loss development factor. After demoing a few visualization examples, we'll show how some formatting tricks can be used to make your visualizations look polished.

**Learning Objectives:**

1. Demonstrate when alternative representations of common actuarial visualizations are helpful
2. Basic use of the ``ggplot2`` package
3. When and how to use non-data formatting to customize a visualization for your audience

**Session Format:** Concurrent Session, 50-60 minutes

**Theme:** Navigate

**Applicable Areas:** Actuarial Toolkit: Programming Software, Data Manipulation Tools, and Data Visualization Tools

**Knowledge Level:** Level 2: General Knowledge of the Subject (6-9 years)

**Interactive Elements:** There will be one or two discussion prompts, as well live voting to compare different means of visualizing data analysis



**To Be Removed. For Reference Only.**

# Effective Data Visualization for Actuaries

Brian Fannin  
Jordan Bonner



# Effective Data Visualization for Actuaries

Brian Fannin

Jordan Bonner



# Antitrust Notice

- The Casualty Actuarial Society is committed to adhering strictly to the letter and spirit of the antitrust laws. Seminars conducted under the auspices of the CAS are designed solely to provide a forum for the expression of various points of view on topics described in the programs or agendas for such meetings.
- Under no circumstances shall CAS seminars be used as a means for competing companies or firms to reach any understanding – expressed or implied – that restricts competition or in any way impairs the ability of members to exercise independent business judgment regarding matters affecting competition.
- It is the responsibility of all seminar participants to be aware of antitrust regulations, to prevent any written or verbal discussions that appear to violate these laws, and to adhere in every respect to the CAS antitrust compliance policy.



# Visualizations should:

- **Be Easily Interpreted**
- **Tell a Story**



# Icebreaker Examples

A slide or two that are difficult to interpret,  
then a slide or two that are easy to interpret?



# **REVISITING COMMON ACTUARIAL EXHIBITS**



# Common Actuarial Exhibits

- Loss Development Triangles
- Trend Selection
- Rate Indications
- Mix Shift Exhibits
- Model Diagnostics





# Loss Development Triangles



# Loss Development Triangles



# Trend Selection



# Trend Selection



# Rate Indications



# Rate Indications



# Mix Shift



# Mix Shift





# Model Diagnostics



# Model Diagnostics



# PRACTICAL FORMATTING TRICKS



# Titles & Renaming Variables



# Text Size



# Colors

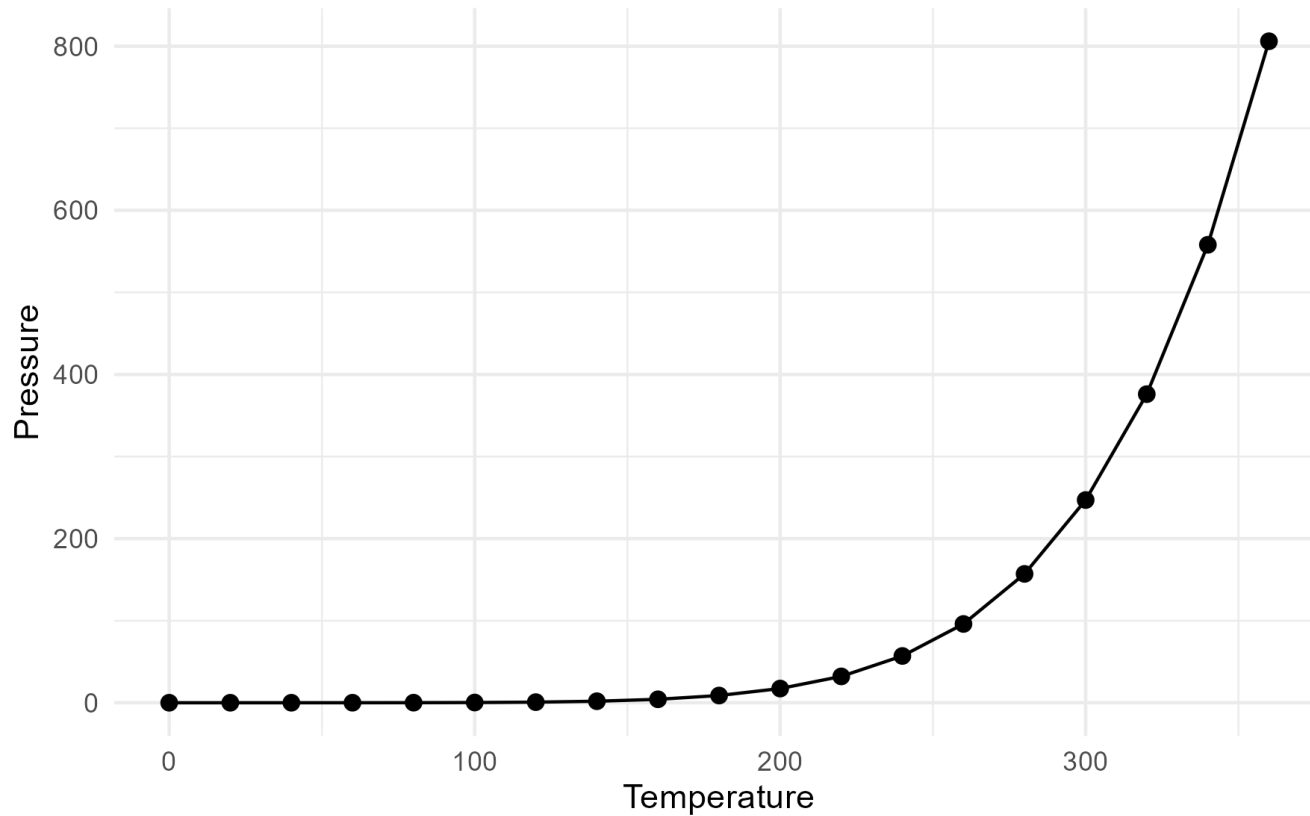


# APPENDIX



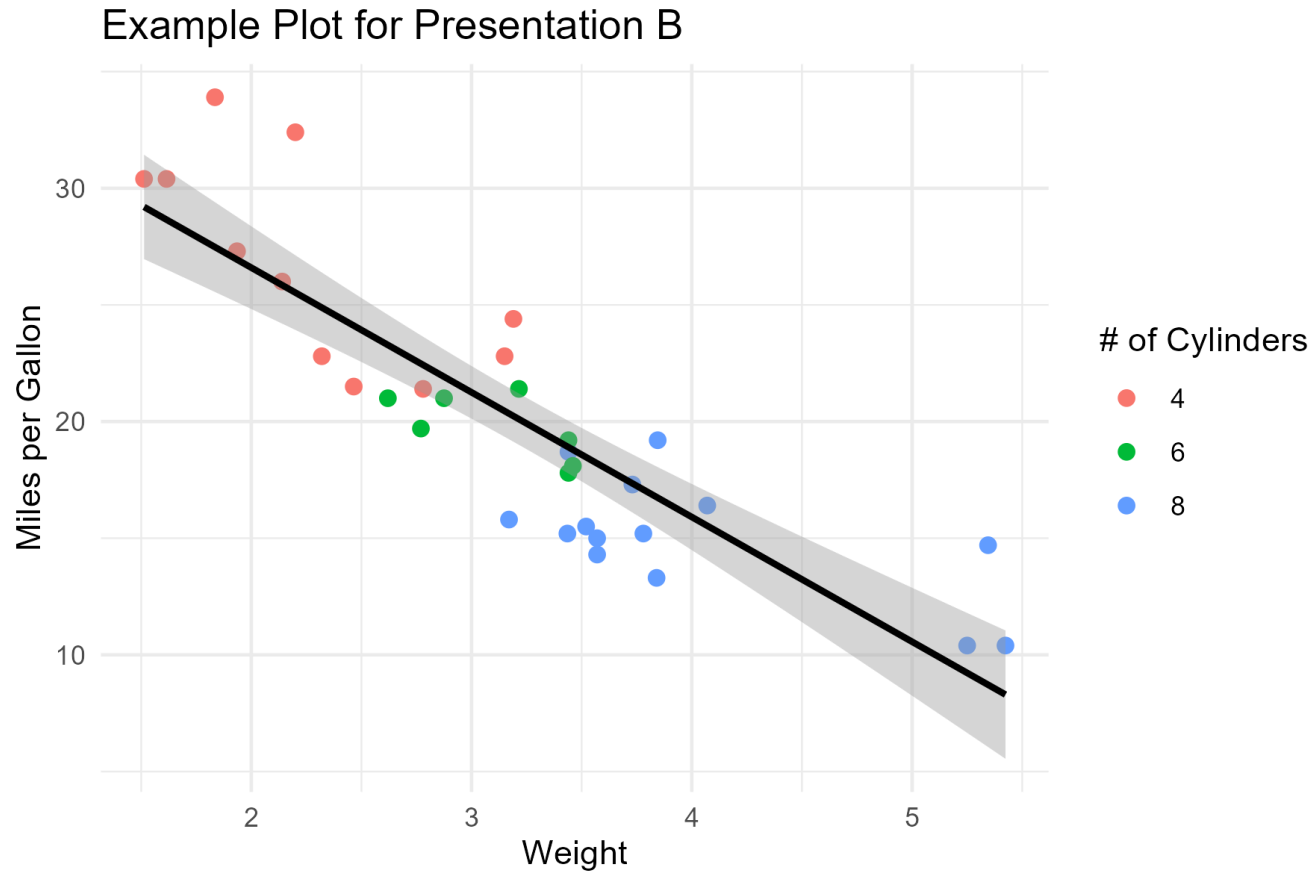
# Example Plot A

Example Plot for Presentation A





# Example Plot B



# Example Plot C

