**Data Visualization  
140.610.79**

**Problem Sets**

These are intended to be started in class if there is time and submitted by the start of the next class (or by noon on our final day). They are practice.

You can use any data set for these, including ones built into R, like *mtcars*. It is recommended you try to use data relevant to your area of study if you have it on hand. Example data sets will be provided.

**Grading**

Problem sets will be graded based on completion only. To receive full credit, you must submit all required plots and code as well as any accompanying explanations or interpretations.

Submissions should reflect a good-faith effort to engage with the material. These assignments are intended to support your learning and prepare you for the final project.

**Problem Set 1**

Using any data set, create the following:

* Bar chart
* Scatter plot
* Histogram

Provide the code for each.

For each plot, briefly describe a scenario or question in which this type of visualization would be useful. For example, what kinds of variables is it best suited for? What insight does it highlight?

**Problem Set 2**

Create one three-variable visualization. Demonstrate the construction of your visualization step by step, showing intermediate stages of code and output. For example, start with a blank canvas and progressively add layers, facets, and annotations.

Your visualization should reflect the layered structure of the grammar of graphics. Use ggplot2 syntax to build the plot step by step.

For example, start with ggplot(data, aes(...)), then add layers like + geom\_point(), + facet\_wrap(), and + labs().

Each code chunk should show a meaningful addition or refinement. The final version should be well-labeled and polished.

**Problem Set 3**

Create one of the following types of visualizations:

* Choropleth or heat map – for geographic or grid-based data
* Ridgeline plot – for comparing distributions across categories
* Forest plot – for visualizing point estimates and confidence intervals

For your chosen plot type:

* Provide the full code used to generate the visualization
* Interpret the figure: What does the visualization show? What insight does it reveal? Who might this be useful for?

**Tip:** Try to pick a plot type and data that you can re-use for your final project.