Module 3: R

Submodule 7: Visualization

Expected length: 0.5 day

Guiding question: How can we visualize data in a clear and appealing way using R?

Concepts: grammar of graphics, barplot, histogram, scatterplot, EDA

Description: This lesson introduces students to 3 basic graph types and runs through possible customizations to make professional-looking graphs. It also demonstrates the use of visualization for EDA.

Instructor Preparation: Run all code to ensure it generates the same output as described in the lesson. Select dataset for EDA live coding.

| Materials and resources | Learning objectives |
| --- | --- |
| 07-visualization\_deck.html | 1. Familiarity with scatterplots, histograms, and barplots  2. Ability to construct graphs using ggplot grammar  3. Ability to customize graphs, including scales and labels |

| Length | Lesson content | Guidelines, tips, and tricks |
| --- | --- | --- |
| 30min | Initializing plots, specifying variables, and choosing chart types |  |
| 30min | Formative exercise  Using different variables:  1. Make a barplot  2. Make a histogram  3. Make a scatterplot | Depending on student progress to this point, the exercise can either use data() or imported csvs that the students are provided with or find.  Allow 15 minutes of independent work time.  Take up for 15 minutes, with RStudio open to demonstrate.  Ask students for errors they encountered. |
| 30min | Customizing plots with labels, axes, color, size, multiple graph types, multiple plots, and overall look |  |
| 60min | Formative exercise  Take your:  1. barplots,  2. histograms, and  3. scatterplot from before  and customize them. Try to add each different customization to at least one plot. | Depending on student progress to this point, the exercise can either use data() or imported csvs that the students are provided with or find.  Allow 30 minutes of independent work time.  Take up for 30 minutes, with RStudio open to demonstrate.  Ask students for errors they encountered. |
| 30min | Live coding: EDA | Ask students in advance for datasets of interest or use data that you are familiar with. Walk through loading, viewing, and visualizing live – ideally with little preparation beforehand, so students can see the process. Ask for contributions to make decisions during the process. |
| 30min | Summative assessment: Discuss visualization | At this point, students have the skills required to do some EDA using visualisations. Give them some time to make some preliminary graphs for their datasets. Suggest that they view ggplot resources to explore types of visualizations other than barplots, histograms, and scatterplots. |