

# Problem Set 1

## Data Visualisation for Social Scientists

Due: January 28, 2026

### Instructions

- Please show your work! You may lose points by simply writing in the answer. If the problem requires you to execute commands in R, please include the code you used to get your answers. Please also include the .R file that contains your code. If you are not sure if work needs to be shown for a particular problem, please ask.
- Your homework should be submitted electronically on GitHub.
- This problem set is due before 23:59 on Wednesday January 28, 2026. No late assignments will be accepted.

## Roll Call Votes in the European Parliament

### Data Manipulation

First, you need to download data from the first six elected European Parliaments on each MEP and how they voted in each recorded roll-call vote.

1. Load these datasets into your global environment:
  - `mep_info_26Jul11.xls` (MEP characteristics, EP1–EP5)
  - `rcv_ep1.txt` (EP1 roll-call votes)
2. Briefly describe (2–3 sentences each) the unit of analysis and key variables in each of these two datasets.
3. The `rcv_ep1` data are in a wide format, with  $V_1, V_2, \dots, V_n$  as separate vote columns.
  - Identify which columns are ID/metadata (*MEPID*, *MEPNAME*, *MS*, *NP*, *EPG*) and which columns are vote decisions ( $V_1 \dots V_n$ ). Tidy the voting data such that each row/observation is a single vote for a single MEP.

- Create a summary table of counts of decision categories (e.g. Yes/No/Abstain/Present but did not vote/Absent) across all votes.
4. Construct a new dataset that combines MEP-level information with their vote decisions from EP1 in long format (from part 3). Check for missingness.
  5. Compute, for each EP group in EP1:
    - The mean rate of Yes votes (Yes over Yes+No+Abstain) across all roll calls.
    - The mean abstention rate.
    - The mean vote preferences along the two contested dimensions (NOM-D1 and NOM-D2).

## Data Visualization

1. Plot the distribution of the first NOMINATE dimension by EP group, and explain any trends you see.
2. Make a scatterplot of *nomdim1* (x-axis) and *nomdim2* (y-axis), with one point per MEP and color by EP group.
3. Produce a boxplot of the proportion voting *Yes* by EP group to visualize cohesion.
4. Display the proportion voting *Yes* per year by national party using a bar plot.
5. For each EP group, calculate the average *Yes* share per year and plot a line graph.