University of Trento --- M.Sc. Data Science

Data Visualization Lab Exam
12 June 2020

Create a Jupyter and/or R Notebook, named
name_surname.{ipynb,Rmd}

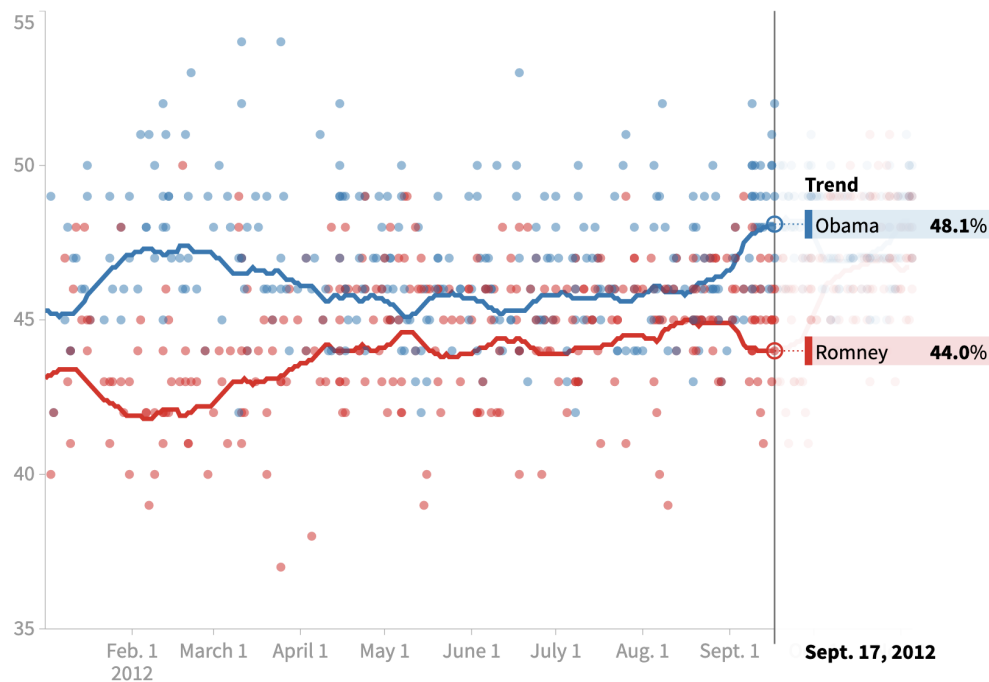Answer the questions (in a Markdown cell/ as plain text) and solve the exercises listed hereafter:

1. [0-5 points] Describe in detail the elements of visual encoding (marks and annotations), their meaning and their use. Explain and comment the meaning of the visual encoding elements in the following picture.

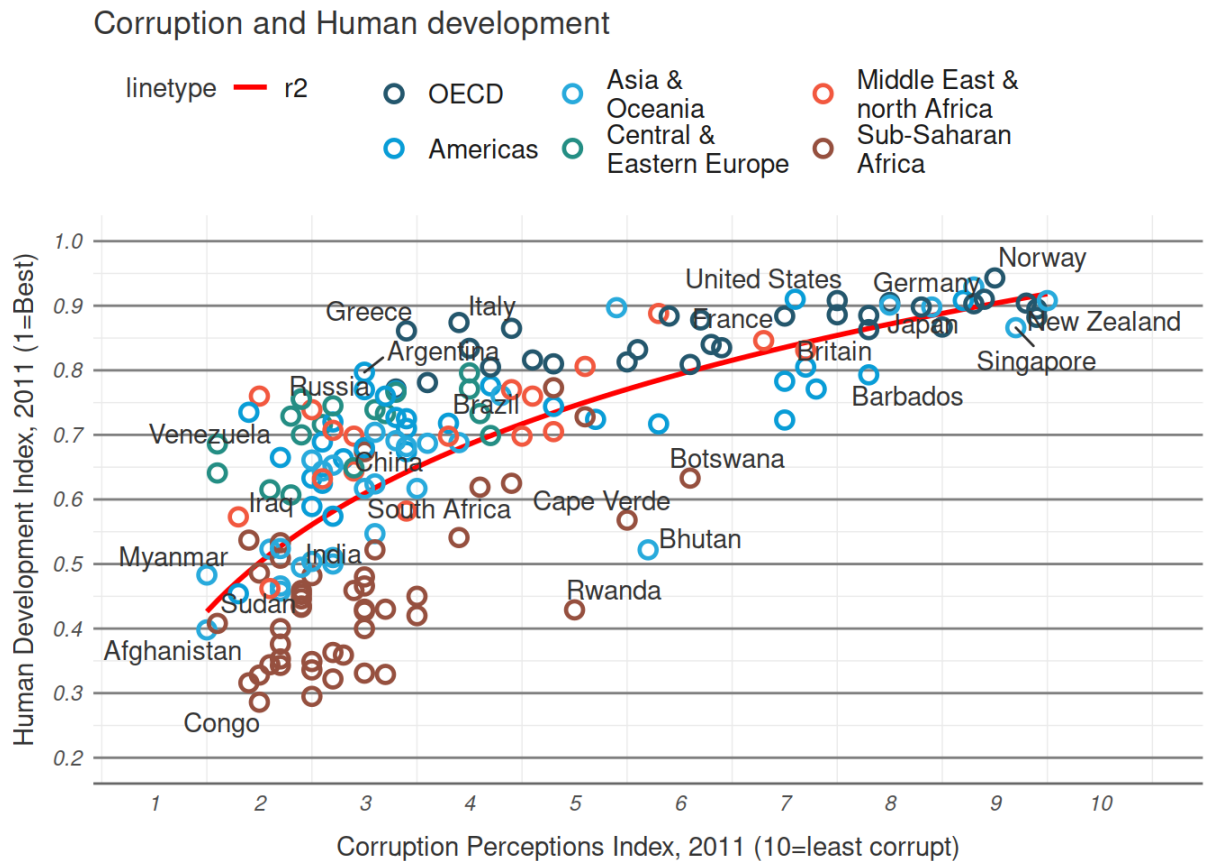POLL CHART
2012 General Election: Romney vs. Obama

📶 Currently tracking 590 polls from 62 pollsters   ⏲ Updated almost 4 years ago   📅 Election on November 6, 2012   **Customize this chart**   **FAQ**

This chart combines the latest ● opinion polls into ∿ trendlines using a **poll-tracking model** and is updated whenever a new poll is released.

2. [0-5 points] Describe the step "Editorial Choices" in the Stage 3 of the Data Visualization Workflow; then provide 3 data visualization examples (not those in the lecture slides) to highlight *focus*, *framing* and *angle* concepts, respectively.

3. [0-5 points] Describe the MDS family of algorithms, and comment similarities and differences with PCA. Then explain the differences between Classical, Metric and Non-Metric MDS, and provide an example where only one of the three above choices is adequate.

4. [0-7 points] Using the datafile economist_data.csv, prepare a chloroplet map of a geographical region of your choice (Europe, Asia, etc) displaying one (or more) of the columns HDI.Rank, HDI, CPI.

5. [0-7 points] Consider the dataset countries.csv : prepare a dimensionality reduction planar projection (using the method you rate as the most adequate), color the countries according to your preferred grouping and comment one or more facts emerging from the plot.

6. [0-7 points] Using the datafile economist_data.csv, try to replicate the following plot, where Human Development Index is column HDI and Corruption Perception Index is column CPI; the red line can be a smoothing line of your choice.

Email the notebook(s) to giuseppe.jurman@unitn.it and please **wait for confirmation of correct receipt of the files before leaving the room**.

Notes:
- Exam is passed when at least 18 points are earned.
- If more than 30 points are achieved, the corresponding mark will be "30 cum laude"
- Use of the internet is allowed, but the candidate is expected to work individually.