

Exercise Sheet 1

Information and Software Visualization (SoSe 2020)

Deadline: Tuesday, 05.05.2020, 14:30

Create an individual solution to the exercise. Group discussions are allowed and, in fact, encouraged while coming up with the conceptual design of your solution. However, the individual solutions should still be clearly distinguishable from each other (*i.e.*, write text in your own words and develop programs individually).

The submission takes place via *Moodle* as a single zip file containing a version of your program with all required files to run locally (without having to start a local server!) in the current version of *Google Chrome*. The main file should be named `index.html`. The use of additional libraries is permitted. To reduce the programming effort and workload, we have provided a template that can serve as a starting point for your solution. It contains the dataset in a variable named `data` and already specifies a general structure of the web page. We encourage everyone to use this template.

This exercise sheet consists of 1 task with a total of 20 points (20 points $\hat{=}$ 100%).

Task 1 [Points: 20]

You are provided with a dataset for this exercise. It contains the **appropriateness** of certain **behaviors** in different **situations** as numerical values. There are fifteen different **behaviors** and **situations**. A higher **appropriateness** value for a given **situation-behavior** pair means that the corresponding **behavior** is more appropriate to that **situation**.

You are required to develop a web-based visualization using *JavaScript* and *D3* for showing the appropriateness of different behaviors in certain situations. The implemented visualization should meet the following requirements:

- (a) (10 Points) **Basic visualization:** The visualization should provide an overview of all numerical values of appropriateness. The exact values of appropriateness may not be readable as a number but should be encoded as properties of visual elements (*e.g.*, colors, sizes, shapes, lines, etc.). Also, the visualization should be able to provide a visual comparison between different behaviors or situations without performing any interaction. For instance, users should be able to tell (by just looking at the visualization) which situations are similar or different. Finally, the visualization should have clearly visible labels for behaviors and situations, and a legend that explains the visual encoding of appropriateness values.

Figure 1 shows a possible solution that fulfills all of the above-mentioned requirements (excluding a legend). It encodes the value of appropriateness as the size of squares. Implement it or a comparable solution that meets the requirements, and then extend it to support interactions as specified in the following subtasks.

- (b) (4 Points) **Interaction:** The exact numerical value of the appropriateness should be interactively retrievable by selecting (*e.g.*, clicking or hovering) the associated graphical element *i.e.*, a square. The corresponding graphical element should become highlighted. The scheme chosen for highlighting a graphical element should not interfere with the encoding.
- (c) (6 Points) **Comparison:** Define and use a reasonable metric that allows you to compute the similarity between two situations. A selection (for example, *mouse over*) of a situation should visualize the computed similarities of the situation to all other situations. The visualization should make similar and dissimilar situations easily identifiable, but exact numerical values of the metric need not be recognizable.

Explain briefly to what extent your solution meets the respective requirements and what similarity metric you have chosen and why. Complete the description as text on the Web page under the visualization.

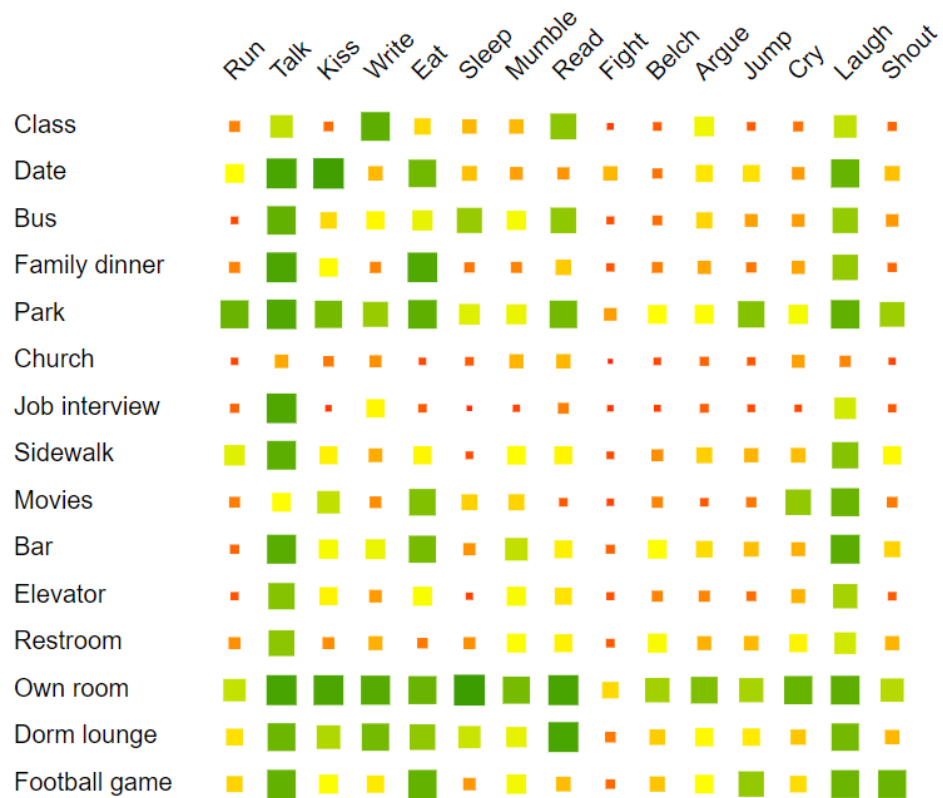


Figure 1: Basic Visualization