Universität Stuttgart

Institut für Visualisierung und Interaktive Systeme

Assignment 9

Information Visualization & Visual Analytics (WS 2019/20)

Due: Monday, 13.01.2020, 11:59 AM **Discussion:** Wednesday, 15.01.2020

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Please solve the assignment in **groups of up to three (3) students**. Choose one student who uploads your solution on the assignments page in ILIAS as PDF (for theoretical submissions) or ZIP (for practical submissions Impl). The submitted files should follow the naming scheme `yourlastname1_yourlastname2_yourlastname3` with respective file-ending, of course. Make sure that you create your team before uploading the solution.

Please post general questions regarding the exercise, but *no solutions,* to the forum. In case of more specific problems, especially such that cannot be posed outside of the context of your own solution, please send an email to, or make an appointment with, the tutor responsible for the exercise.

Task 1 Evaluating Bar and Pie Charts *[Points: 8]*

You want to conduct a study to investigate whether people are quicker at identifying the category with the highest value (out of ten categories) with bar charts (condition `A`) or pie charts (condition `B`). Due to the high effort that is required to recruit participants, you decide to expose each participant to both conditions (within-subject design).

(a) *(5 points)* Describe the experimental setup. How would you perform the study? What would you show to the participants and when? Briefly sketch how a typical trial with a proband could run.

(b) *(3 points)* What are potential shortcomings of the within-subject design compared to between-subject? Did you try to mitigate these issues in your setup you described in (a)? Describe how the experimental setup should look like to mitigate at least some of the issues.

Task 2 Santa Clause Is Coming To Town *[Points: 13]*

Visual Analytics tries to combine the processing power of computers with the analytical reasoning skills of human beings. Imagine you recorded last year how Santa Clause delivered Christmas parcels from Amazon in Germany. Each item consists of the order date, delivery date, destination, and the price. Your goal is to investigate across different regions and cities how much Amazon customers spend on Christmas gifts, how early (or late) they start ordering, and how many parcels fail to arrive before Christmas eve.

(a) *(3 points)* Why do you think a Visual Analytics approach is beneficial for the aforementioned goals compared to completely automatic/static solutions?

(b) *(5 points)* Sketch how you would present a static overview of the data set. Do you aggregate data and why (not)? Describe at least three tasks (e.g., average delivery duration in big cities) users could solve with your approach.

(c) *(5 points)* Sketch how you would extend your approach to make it interactive. Which operations (e.g., to filter) can users perform? How would the view/layout change? How does your interactive approach support users to tackle the aforementioned goals?

(d) *(4 points)* **Bonus (optional)**: You trained a machine learning model that predicts the probability (e.g., 90%) that a parcel arrives before Christmas given the order date, price and destination. How would you integrate this attribute into your approach?