IGR 204 Information Visualization Spring 2017-2018 (S2P4)

Final exam

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Your name: _____

Instructions:
- You have 1 hour 30 minutes to complete this exam.
- No notes and no electronic devices are authorized.
- Exception: paper dictionaries are permitted.
- All work should be yours and yours alone.
- Answers should be short and clear. They should fit in the space provided.
- You may respond in either English or French.
- There are 40 points total.

True/False (6 points, +1 per correct response, -½ per incorrect response)

_____ 1. A good visualization should be clear and understandable by any user.

_____ 2. A chart should always show zero as its baseline.

_____ 3. Greyscale color encoding is useful for showing absolute values.

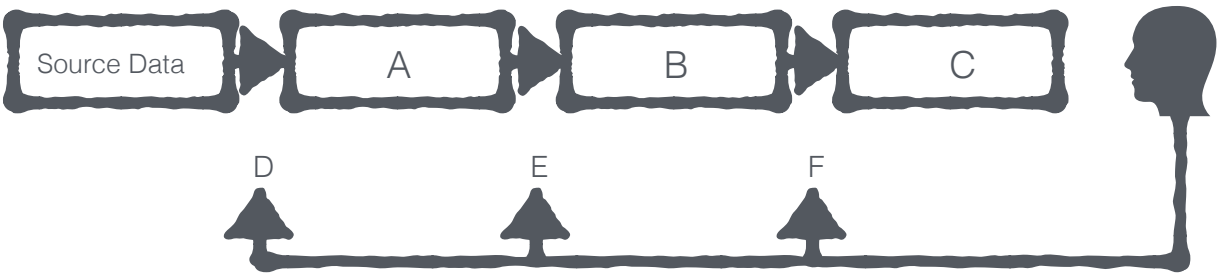
_____ 4. Tree maps best show the structure of homogenous hierarchical data.

_____ 5. For all types of visualisation, the positions of graphical marks are determined by the data.

_____ 6. Interactive visualisation is useful only when the user knows what to look for.

Short Answer Questions

7. Label each of the points, A–F, in the InfoVis data pipeline below. (3 points)



8. You are given a data set of the number of people saved and lost by each of the following superheros: Iron Man, Wonderwoman, Luke Cage, and Jessica Jones. It contains the attributes: the superhero, whether the person was lost or saved, and the normalized date in the Marvel Universe when the event happened. Choose two questions and create a single spatial mapping and encoding of these three dimensions that helps answer these questions. Justify your response. (6 points)

9. Edward Tufte argues that a visualization should not lie about the data. What are three ways that we have seen for a visualization to lie? (3 points)

10. Describe two problems with the full hue (rainbow) color scale to encode quantitative data. (2 points)

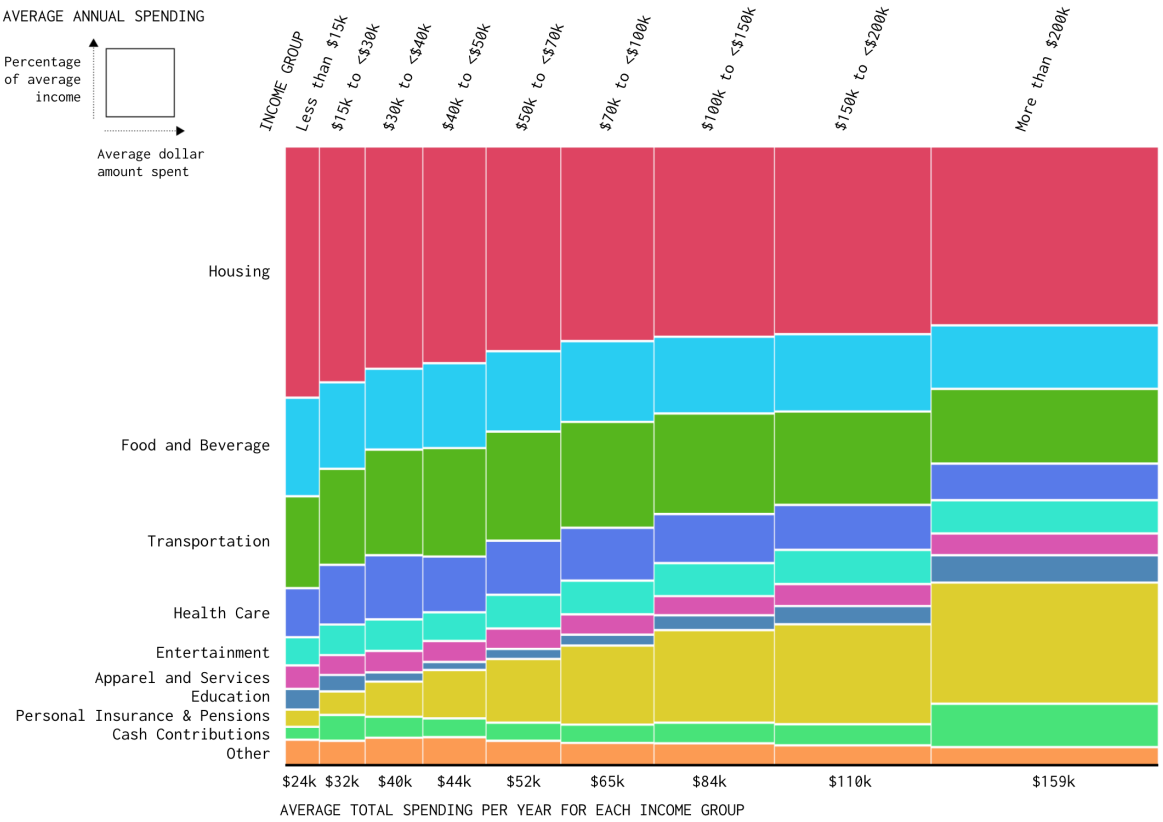
11. Give an example of a visualization technique for (a) univariate, (b) bivariate, (c) trivariate, and (d) hypervariate data. (4 points, 1 point each)

12. Identify two distinct ways that we have seen in class for drawing a tree. Provide a name and a drawing of each. (4 points)

13. a) What is the notion of separability of graphical properties (or graphical channels) for marks and why is it important? b) Describe two properties that are separable and two properties that are not separable. (3 points)

14. Describe three analytic tasks seen in class. For each task, sketch a visualisation or interaction that helps demonstrate that task in action. (3 points)

15. Critique the visualization shown on the following page. a) Identify one pertinent task for which it is well-suited and one pertinent task for which it is ill-suited. b) Describe one problem with this visualization and how you would fix it. c) Describe one thing the design of this visualisation does well and why. (6 points)


AVERAGE ANNUAL SPENDING
Percentage of average income
Average dollar amount spent
INCOME GROUP
Less than $15k
$15k to <$30k
$30k to <$40k
$40k to <$50k
$50k to <$70k
$70k to <$100k
$100k to <$150k
$150k to <$200k
More than $200k
Housing
Food and Beverage
Transportation
Health Care
Entertainment
Apparel and Services
Education
Personal Insurance & Pensions
Cash Contributions
Other
$24k
$32k
$40k
$44k
$52k
$65k
$84k
$110k
$159k
AVERAGE TOTAL SPENDING PER YEAR FOR EACH INCOME GROUP