IGR 204 Information Visualization Spring 2018-2019 (S2P4)

Final exam

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Your name: Sample

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 44 points total.

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

T 1. A good visualization should provide a dense view of the data.

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

T 3. Greyscale color encoding is useful for showing relative values.

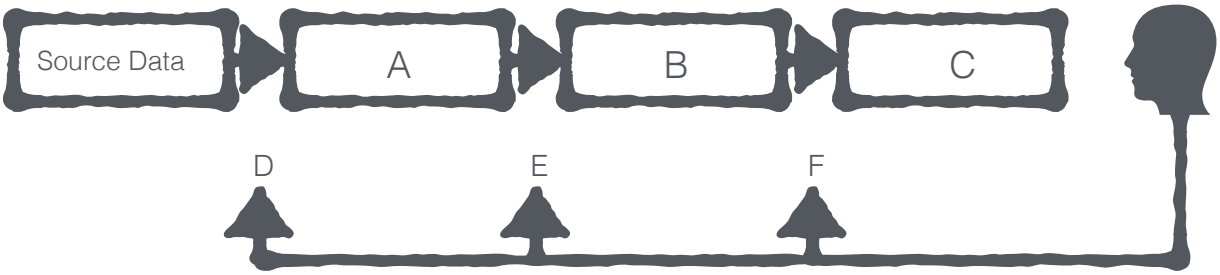
T 4. In a matrix drawing of a graph, a large square represents a fully-connected clique.

F 5. In a graph-on-rails, the size of all graphical elements is determined by their position.

T 6. Tableau, Altair, and D3 all use the concept of mapping data values to graphical properties.

Matching Question

7. Fill in the appropriate letter for each of the parts of the InfoVis pipeline below. Some labels will remain blank. (3 points)



B View abstractions

D Data transformations

F View transformations

C Views

E Visual mappings

_____ Visual design

_____ Data cleaning

A Data tables

Short Answer Questions

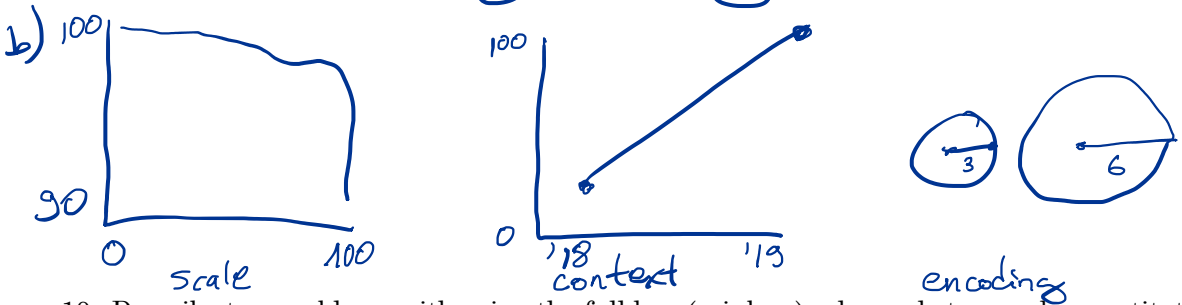
8. You are given a data set of episodes from Game of Thrones. For each episode, it contains the characters killed, their affiliation, the number of romantic encounters depicted, the average visual darkness of the image, and the episode's average rating. Choose two questions and create a single spatial mapping and encoding of three of these dimensions that helps answer these questions. **Justify your response.** (6 points)

Various.
- 2 pertinent questions
- 1 view
- Justification: why this mapping, how it answers these questions

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

- not show full/appropriate scale
- not show full/appropriate context
- use misleading encodings

b)



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

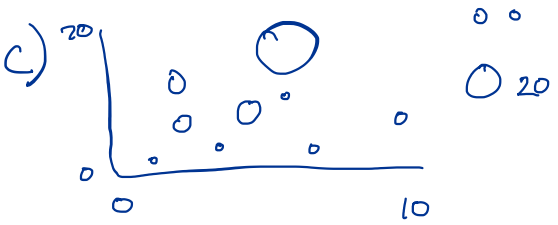
1) No naturally-perceived order
2) Not perceived smoothly / banding

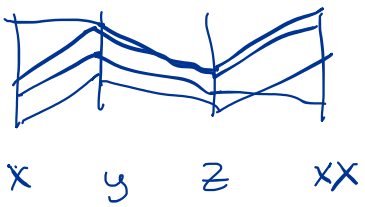
11. Give an example of a visualization technique for (a) univariate, (b) bivariate, (c) trivariate, and (d) hypervariate data. (2 points)

Various...

a) 

b) 

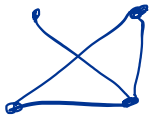
c) 

d) 

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

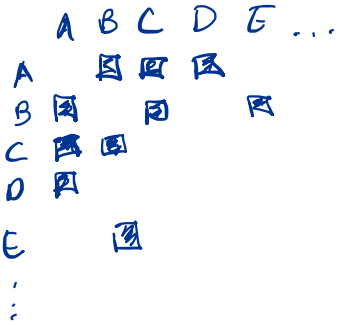
node-link drawing:

and variants



matrix drawing

and variants



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. (6 points)

a) Two graphical properties are separable if they can be perceived and interpreted independently. This is important because two non-separable properties will be interpreted holistically. That is, the reader will have a hard time reading each mapped data value.

b) separable: position, color

non-separable: r-b color, g-y color

14. Describe three analytic tasks seen in class. For each task, sketch a visualisation or interaction that helps demonstrate that task in action. (6 points)

various.

see Tasks lecture

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)

Various.

a) well-suited:
- see evolution of a state's vote
- see evolution of national trends
- see which states vote as a block
- see overall swings for a given state
- ...

ill-suited:
- see populations/sizes of counties
- see how many people voted each way
- compare voting power of each state
- ...

b) various

c) various

Election outcomes in the United States presidential election for years 2000–2012, by state.