CSCI 4964/6963 Interactive Visualization — Quiz 1
Friday, March 4th, 2016 — 2pm-3:50pm

Name:

RCS username:

This quiz is closed book & closed notes except for
one 8.5x11 (double-sided) sheet of notes.

Please state clearly any assumptions
that you made in interpreting a question.

Write your answer in the box provided below
each question. Be sure to write neatly.
You are encouraged to use the provided
colored pencils, crayons, or markers.

1	/ 6
2	/ 9
3	/ 10
4	/ 9
5	/ 8
6	/ 8
Total	/ 50

1   Eenie, Meenie, Minie, Moe [/6]

Match each dataset or application below with the letter of an appropriate chart type (each letter should be used exactly once).

(A) pie chart   (D) scatter plot
(B) line graph   (E) stacked vertical bar chart
(C) word cloud   (F) horizontal bars

☐ Presenting the contents of a presidential candidate's tweets and the frequency of different topics.

☐ Showing the polling results of the different candidates over time.

☐ Illustrating the diversity (e.g., age or race) of the electorate (voting population) for a specific state.

☐ Trying to determine if there is a positive or negative correlation between a voter's education (# of years in school) and the amount of money they donate to a specific candidate.

☐ Ranking the current fundraising totals of each of the presidential candidates.

☐ Showing the number of days each candidate spent campaigning in the four states that hosted the first presidential primaries.

2 Brewing Color Schemes (It's Crayon Time!) [/9]

Below are three diagrams of the desks in our classroom. Sketch a reasonable estimate of the data for its current occupants and carefully label the legend. On each diagram mark yourself with an asterisk, '*'. Also indicate whether your chosen color scheme is *sequential*, *qualitative*, or *diverging* (each type should be used exactly once).

height, relative to the average

type: _____

hair length

type: _____
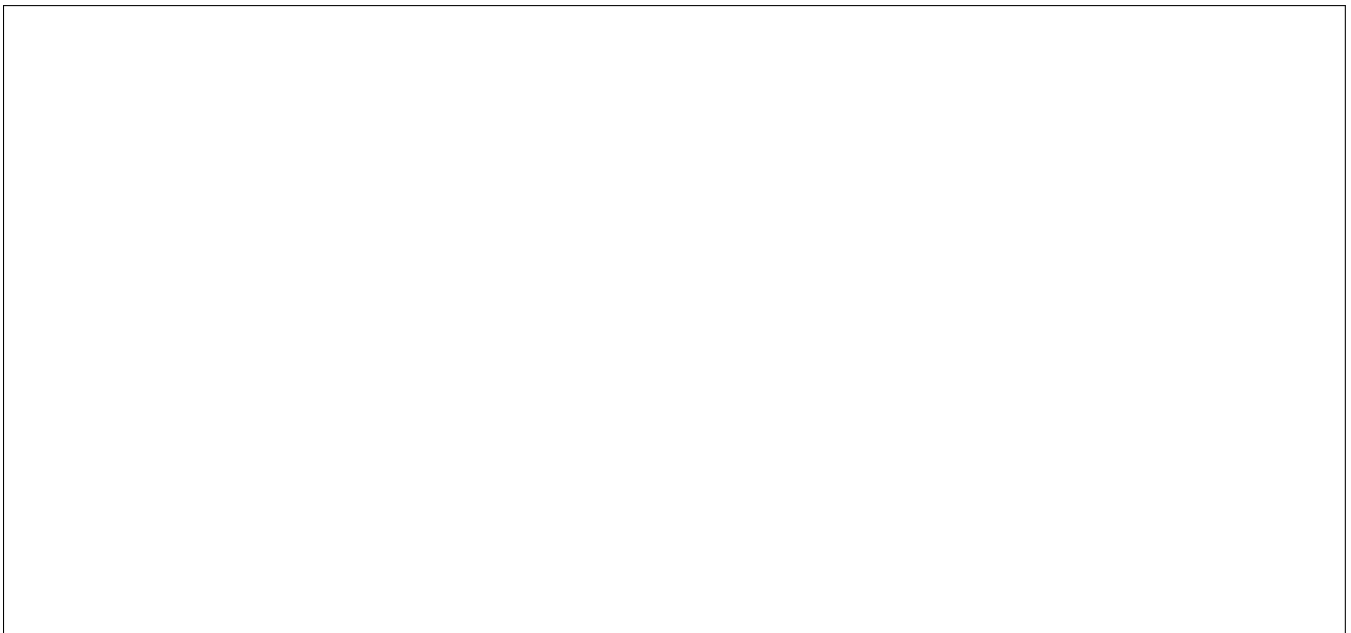
undergraduate graduate student, ta, other, unknown

type: _____

2

3 Parallel Coordinates [/10]

Design a parallel coordinates visualization for food with these five dimensions/axes: calories per serving, time/effort required to prepare this food, how much you like the item of food, the ideal serving temperature of the food, and cost per serving. Think carefully about the conclusions you expect the viewer to draw from this data. Neatly sketch an example of this visualization with four different items of food (your choice). Clearly label the data values on this visualization.

Write 3-4 sentences describing the choices you made in designing this visualization. Explain why these choices are better than other options, ensuring that the viewer accurately interprets the data.

4 Node & Edge Graph Drawing [/9]

4.1 Vocabulary [/5]

Write the common graph term in the box next to each definition below.

	Number of edges incident on the vertex.
	Vertices can be separated into two groups. No edge connects two vertices from the same group.
	A path along edges in the graph, starting and ending with the same vertex.
	A collection of vertices such that an edge connects every pair of vertices within the collection.
	A 2D drawing where no edges cross.

4.2 Force-Directed Graph Drawing [/4]

Select one of the algorithms in: "Force-Directed Drawing Algorithms", by Kobourov from *Handbook of Graph Drawing and Visualization*. Write 3-4 sentences describing a technical detail of that algorithm. Give an example of an interesting graph that demonstrates the success of this algorithm.

5 Short Answer [/8]

5.1 Color Choices [/4]

Which one of these papers did you read? "Color Design for Illustrative Visualization", by Wang, Giesen, McDonnell, Zolliker, and Mueller; "Hue-Preserving Color Blending", by Chuang, Weiskopf, and Mueller; or "A Linguistic Approach to Categorical Color Assignment for Data Visualization" by Setlur and Stone? Write 3-4 sentences describing the technical contribution of the paper that you found most impressive.

5.2 Importance of Interactivity [/4]

Write 3-4 sentences summarizing the motivation for interactivity in "LineUp: Visual Analysis of Multi-Attribute Rankings", by Gratzl, Lex, Gehlenborg, Pfister and Streit.

6 Truthiness [/8]

Almost all of the statements that follow are false. Identify each statement as false or true, and correct each false statement so that it is true (but still informative).

6.1 Studying Junk [/2]

True or False   The user study described in the paper "Useful Junk? The Effects of Visual Embellishment on Comprehension and Memorability of Charts", by Bateman et al. found that users were more accurate in their interpretation of plain charts, but had significantly better recall of the embellished charts 2-3 weeks after viewing them.

6.2 Acronym Headaches [/2]

True or False   The paper "Social Network Clustering and Visualization using Hierarchical Edge Bundles", by Jia, Garland, and Hart used *Betweenness Centrality* to measure and filter out the least important edges in a dense graph. The authors demonstrated their visualization technique on a wide and impressive collection of real-world datasets.

6.3 Brushing it under the Rug [/2]

True or False   The paper "Angular Brushing of Extended Parallel Coordinates", by Hauser, Ledermann, and Doleisch describes a virtual paintbrush technique that varies the line thickness and transparency to improve the clarity of large, high-dimensional datasets.

6.4 Controversial Visualization [/2]

True or False   One of the main advantages of the *Streamgraph*, presented in "Stacked Graphs – Geometry & Aesthetics", by Byron and Wattenberg is the ability of the viewer to precisely quantify the areas of the most significant items in the visualization.