

**Final exam**

James R. Eagan

9 February 2014

**Your name:**  

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**Instructions:**

- You have 1 hour 30 minutes to complete this exam.
- No notes and no electronic devices are authorized.
- Exception: 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.

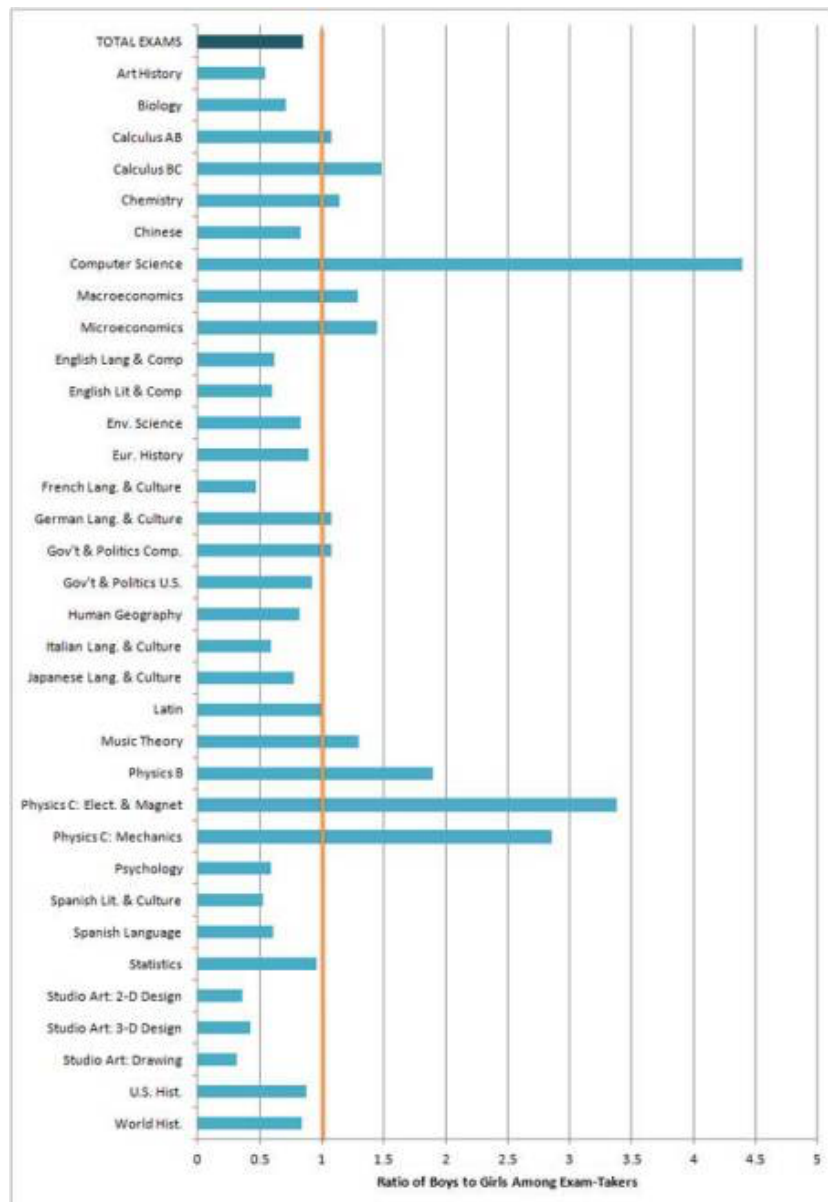
**True/False (12 points, 2 points per response)**

- \_\_\_\_\_ 1. A radial tree-map (e.g., Sunburst) is useful for showing hierarchical data.
- \_\_\_\_\_ 2. The order of data attributes can influence the utility of parallel coordinates.
- \_\_\_\_\_ 3. Metadata is the study of data encoding formats.
- \_\_\_\_\_ 4. Information visualization is useful to help a user explore data.
- \_\_\_\_\_ 5. People can discriminate color pre-attentively.
- \_\_\_\_\_ 6. Pre-attentive processing is a useful technique to transform raw data into a format usable by a visualization tool.

### Short Answer Questions

7. Give an example of a nominal dataset, a dataset that is ordinal but not quantitative, and a quantitative dataset. (6 points, 2 points each)
8. Describe a technique covered in class to visualize a dense graph. (3 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? (6 points)
10. Briefly describe one primary problem with the rainbow color scale. (2 points)

11. Give an example of a visualization technique for (a) univariate, (b) bivariate, (c) trivariate, and (d) hypervariate data. (8 points, 2 points each)
12. What are linked views? Why are they useful? (4 points)
13. Shneiderman's mantra for information visualization is « overview first, pan & zoom, details on demand ». (a) What does this claim mean? (b) What are its implications for InfoVis design? (6 points)
14. What are three primary characteristics of Dynamic Queries interfaces? (6 points)



15. The chart on the previous page shows the ratio of boys to girls who take different advanced placement tests in the United States. Briefly (in one or two sentences) describe one positive aspect of the visualization. Then briefly describe three problems with the visualization and, for each problem, one suggestion on how to fix it. (10 points)