SCI199Y: Essay proposal: example 1

The essay topic I have selected is **Statistics and Football**. I would like to investigate how statistical methods are used in analysis of teams' performance.

The two articles I will start with are *Chance* articles:

- Who's Number 1 in College Football?... And How Might We Decide. by H.S. Stern, *Chance* **8**, 7-14.
- Consistency and Predictability of Football Results. by H. Phillips and D. P. Wilburn.

These two articles both discuss statistical methods for rating football teams, but from different points of view. The first article proposes an analysis method called least squares for using available data on college football teams to select the overall best college football team in a given year. The second article concentrates on high school football, and defines a numerical measure of consistency and predictability called C-P, which I think is the extent to which the better team tends to win.

My focus in the essay will be on the particular techniques used. My goal is to understand as well as I can the use of least squares methods (with reference to the first article) and the C-P measure (with reference to the second article). I will refer to a couple of elementary statistics texts to help me with this, most likely

- *Statistics: Concepts and Controversies.* D.S. Moore (W.H. Freeman): 2nd ed. 1985; 3rd ed. 1991.
- *Statistics.* Freedman, Pisani, Purves, Adhikiri (W.W. Norton): 2nd ed. 1991.

I will also refer to the book *Management Science in Sports*, eds. Machol, Ladany and Morrison (1976), as it has at least one article related to college football, and may have others.

A possible outline for my essay is the following (sections and section headings subject to change):

1. Introduction
2. Summary of Stern's article
   (a) Technical note on least squares
3. Summary of Phllips and Wilburn's article
   (a) Technical note on the C-P measure
4. Related uses of statistics in football: (For this I plan to refer to the article

- Stern, H. (1991) On the probability of winning a football game. *The American Statistician* **45**, 179–183.)

5. Critique: In this section I will consider whether I think statistical analyses are helpful to understanding the sport of football. I will also critique the relevant articles on the basis of their clarity, general interest, and persuasiveness. I will particularly comment on whether or not the articles sparked my interest in exploring the subject further.

6. Data (tentative) Stern's article has a large table of data, and one or two graphical displays might have been very helpful. If I can, I will try to plot some of this data so that the arguments being made stand out visually.

7. Conclusion