AMS 550.400 HW SET 1 Due Date: Oct 8

Last Compiled on October 10, 2012

General Instruction: To complete the homework set, you are required to do the followings. Your solutions must be typed in LaTeX using the course homework template. The progression of your homework solution is to be "recorded" by making a git folder specifically for this homework set. The burden of proof is on you, and if your git commit history is sparse, then you may be liable for a penalty. A paper copy of the PDF output of your LaTeX file is to be submitted to your instructor in class on the due date. *After* submitting the paper copy, but *before* the end of the due date, you will upload your work to your github by making a remote repository specifically for the homework, and post the link to the repository at the designated *Discussion* forum in Blackboard by making a thread just for you. The repository name in your github should be `550400.homeworkset.1` and the discussion forum thread should be named `YourFirstNameMiddleInitialLastName`, e.g., `BaracHObama` and `WillardMRommey`. You have till the end of the due date to finalize your github repository. However, any commit made after the class time of the due date will be inadmissible. *Your attention to details in following this instruction will be critical, and if not followed exactly at the time of collection, the homework set may be graded at* 90% *of the full score.*

Problem 4 (aka. Fair Play, 40 pts): Answer the following question:

> Is the tennis game fair?

Note that unlike Problem 3, this question is vaguely stated. This is intensional, whence to begin, you will first need to clarify what exactly your question is. You may use the class discussion on this particular problem, but you *may not* directly refer to our discussion. Instead, formulate the model carefully but concisely in your own words.

Problem 4 (aka. Fair Play, Solution):

Step 1:

So the problem stated here in question 4 is very general. To start analysis the problem, consider different factors involving the tennis game and fairness of the game. First, in term of the fairness, will be definied is if a player has a better skills in tennis, the rule would not in anyway deminishing that advantages. For example, before the game start, 2 palyers will be asked to guess the coin toss, the personal who win the coin toss will choose to serve fisrst(or the sides). If the palyer who serverd first will have a advantage, then the personl win the coin toss will have the advntage. Even the coin toss will have equal chance of winning, it dimnensh the advantage or further enhance the advantage of the palyer with better skills. Also full round of tennis is 9 round. If the 2 player have the equl skills in the tennis, as the game advance, the game will become in favor of the palyer have better phisical strengths.

Thus the problem is restated into Is the player who serverd first will have better chance of winning.Or the person with better physical stength will have advantage in the game. If throgh the model, it is able to show that the answer to those questuon is no, then tennis is most likely a fair play.(For this model, we will onyl consider the second questions)

Step 2:

The factors involvement is the body strength, the tennis skills, the number of the rounds the game lasts. Body strength is the exogerous variable and the tennis skills and win or lose is the exdogenous variable. The number of the rounds will just be a determing factor for finding the player with relative same level of tennis skills. Then devide the match into 2 sections.The first section will be earlier game mater(from round 1 to round 4), the seocnd will be round 5 to round 8. A leaf plot of the resluts. Finding the games with really tieing score, then comepare the tennis skills of the 2 player(in term of world or league rank) Find if long game is able to dimenshing or enhance the odds towards the player with better body stength and how much tennis skills (rank) will be overcomed through this effect.

Steps 3: If there's a sititastial significan shows that better body stength will over come tennis skil within certain level, conlcusion can be satated towards that. The model rely on the accuracy of directly correctaion of world rank and tennis skills. If the world rank is not a very accurate implication, then the model will not be useful. Aslo world rank is very limied to top 100. So the samle size will also be restricited. Thus the statistical significant of the results wmust be further evulaetd befroe reaching a conclusion .

Steps: tets data using real tournment statistical doing the data analysis according to the model.