STAT 100 Brief Lecture Notes Jan 5, 2010

Intro page distributed including Assignment 1 (already posted as well)
Note Assignments handed in at Stat Workshop.
Nature of Course: discussion of applications with techniques introduced as needed.
Role of text: background information for applications and assignments.
Role of Freeware R: Optional for students, but will be used by instructor for demonstrations. Google "R statistics" for download if desired.

Discussed **Sports Leagues Example and Simulation Procedure**

Internet – view real soccer league. Illusion of quality?
Use coin tossing to simulate equal-team-quality hypothesis
Compare with real league data
Note role of tie rate in league points (W=3, T=1, L=0)

Random Walk and the Stock Market

After many tosses (done on computer) tendency for proportion of heads to converge to ½ even though number of heads does no converge to number of tails.

Random walk (cumulation of +1 and -1 outcomes) has apparent trends that cannot persist because the coin is fair. An illusion of randomness.

Models and Real Life

Treating a game as a fair coin toss is a "model".
Models can be useful even when they are wrong.
They provide a useful approximation in some cases.
They provide a benchmark for comparison.

Stigler's big ideas of stats

Averaging
Rootn rule
Hypothesis test
Normal curve
Regression toward the mean
Random Sampling
Statistical Study Design
Graphical Display of Data
Chi-squared distribution
Modern Computation and Simulation

But you could know all these and still not be able to extract valid information from a given data set, nor design a sensible data collection protocol. You need some practical experience to learn the process of data analysis.

Introduction of Cobb-Gehlbach article (p3 in text)

The idea of hypothesis testing with data is a common strategy in statistics

The data in this article is observational (not an experiment). Nevertheless, the causal implication is quite strong, which is unusual for an observational study.

Pros fallacy – it was just mentioned that the issue would be discussed further next lecture.

Reminder Plots: