Problem Set #1

Due 14 Apr 2024

Note, you are submitting all your problems as Jupyter notebooks, so make your code, figures and text readable in a single file.

1) Consider a tank battle simulation where each player has a probability of a win of P. Run the tank battle simulation for a win rate P of 60% for 100, 1000 and 10,000 battles, what are the means, medians and standard deviations. After 50,000th battle, my win rate is 50%. How long with my new win rate of 60% to reach 55% total?

2) Using the file `congress-terms.csv` in the data area, plot the mean age of House and the Senate as a function of time. Comment on your results.

3) Perform a t-test on the husband/wife data to determine if the distribution of husband ages is significantly different from the wife ages.

PHYS510 problem: A large urban hospital has, on average, 80 emergency department admits every Monday. What is the probability that there will be more than 100? Do a poisson and gaussian analysis. How do they differ? Plot a normal distribution that represents the problem.