

LAB 1

The goal of this lab is to demonstrate that the precision of a measurement increases with statistics. In each plot, indicate your expectation as a line (or lines). Your lab report should contain two plots.

1) Roll a six-sided dice 100 times. Record each roll of the dice and plot the probability distribution for the 100 rolls.

a) What is your measured probability for the dice to come up with a 6? How does this value compare with what you expect for this probability? Indicate the expectation on the plot.

b) Write a computer program to simulate the rolling of dice 1,000, 10,000, and 100,000 times. Overlay the probability distribution for each of the computer runs on the plot for the 100 rolls of the dice. How does each of these data samples compare with what you would expect for a probability distribution from a six-sided dice?

2) Roll two six-sided dice 100 times and plot the probability distribution for the sum of the two dice (i.e. how often does 2,3,4...12 come up).

a) Plot the theoretical expectations (lines) for this probability distribution on the same plot as your measured probability distribution. Compare on how well theory and experiment agree.

b) Write a program simulate throwing two dice. Again, use the program to roll the dice 1,000, 10,000, and 100,000 times. Overlay these results on the plot from 2a) and comment on how these results compare with the theoretical expectations.