

Central limit theorem

In this experiment you are going to test the central limit theorem. For that you are going to use ideal, broken, and correlated dice. Complete the tasks below. Figure 1 shows the distributions of rolling single to six dice.

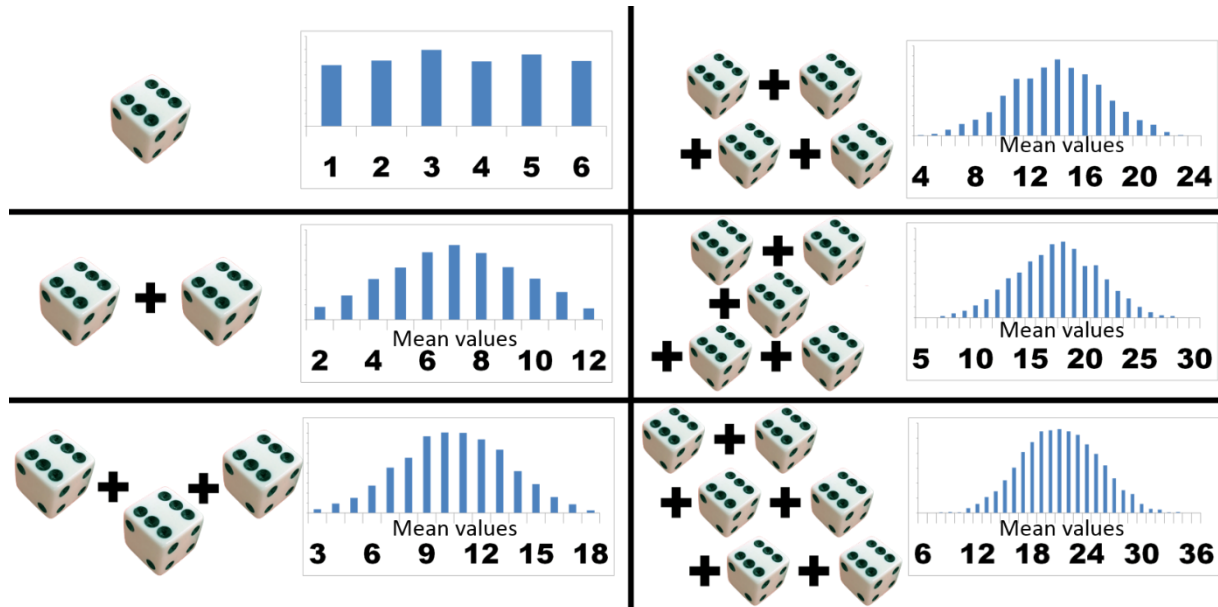


Figure 1 Histogram of the rolling dices.

Task 1. Roll a single ideal dice for 100 times and record the outcomes. Do the same for two, three, and N ideal dices and record the mean values of the outcomes. Plot the distributions for each case, as in fig.1. Comment on your results.

Task 2. Repeat the same procedure as in task 1, for broken dices.

Task 3. Repeat the same procedure as in task 1, for correlated dices. Show that the profile of the outcomes does not satisfy normal distribution.

Task 4: Plot the mean and standard deviation of the distributions as a function of dice in your experiment set.

Task 5. Write a program code that generates random numbers and demonstrate the central limit theorem.