For a four four-sided dice, we can calculate all the possible totals from 4-16 and count the frequency. A histogram of these values is expected to form a bell curve (i.e. scoring 4 or 16 is unlikely but scoring 10 should be more likely). This can be done with four nested loops (one for each die). We find there are 256 possible combinations of four four-sided dice with the most frequent total being 10/256.

The number of times each given total occurs in every combination of four four-sided dice.

This is easily repeated for six six-sided dice.

We now have all possible combinations of totals any of the Peter’s 256 with any of Colin’s 46656

Frequencies