Rolling The Odds:

Experimental Analysis of Dice Rolls and Probability

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Abstract

In this lab we will investigate the probability of rolling a pair of six-sided dice. The main goal is to roll the pair 100 times, we then will have to add the sums, and record the data after every roll. We want to figure out the probability of getting each sum after rolling the two dice. The recorded sum of this experiment reveals 7 to be the most frequent sum being rolled. While 2 and 12 are the least sums being rolled. This result is giving us some important information when it comes to the probability of the sum after rolling the two dice.

Introduction

Dice are one of the most important things that we see in board games and casinos. Dice are a symbol of how lucky someone can be, or could it have a more deeper meaning. When rolling a dice people are held in suspense as the outcome of the dice feels unpredictable, but what if I told you that there is some probability and mathematics involved when rolling a dice. When rolling a pair of dice we get a sum and each sum has more probability to happen again compared to other sums. I think that during this experiment we will see some sums happening more times while others happening less due to the fact that some sums have less numbers that will add up to that sum. For example when playing board games I know that rolling a 12 is something really rare which is why in some games rolling two sixes brings you a high reward. Furthermore during this experiment we hope to get some results when it comes to the probability of the sums of rolling a pair of dice.

Materials

1. Google Docs
2. Excel
3. https://rolladie.net (dice generator)

Methods

1. Make sure to open a document open to record your data
2. Make sure to open an excel sheet to make a table to graph for later
3. Go to https://rolladie.net which is a dice generator if you do not have actual dice
4. Once in the site make sure that the setting is at Roll 1 time
5. When ready click on roll.
6. After every roll make sure to go back to your doc and write down the sum and add to the times it has been generated
7. After 100 rolls go back to your google doc and make a chart with the sums and how many times they were generated.
8. Once your table is done go to excel and make a graph based on your liking so that you can show your results.

Results

The following two figures are showing us the data that was recorded during this experiment. Both of these figures give us a visual and also the numbers behind the probability of each sum when rolling the pair of dice.

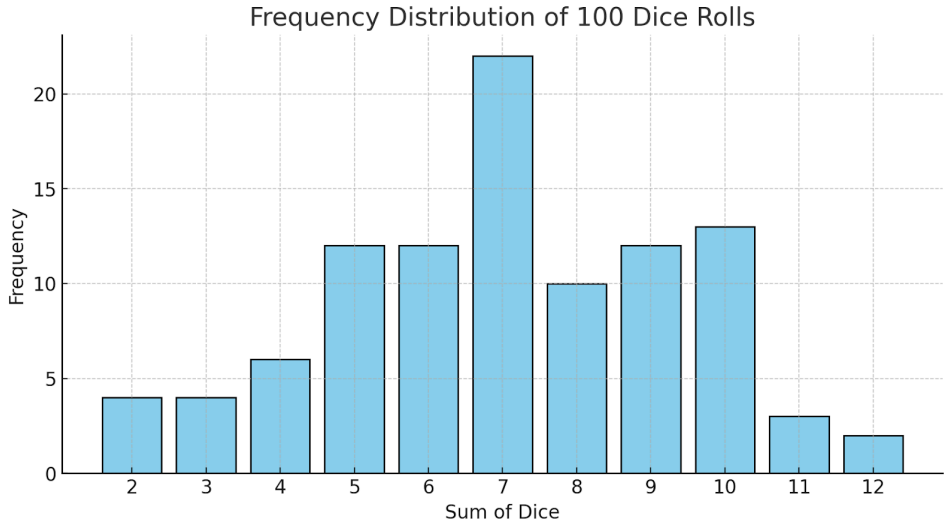

Fig.1 - This is a Bar Chart showing us a visual of the Frequency of the sums.

Sum	Frequency
2	4
3	4
4	6
5	12
6	12
7	22
8	10
9	12
10	13
11	3
12	2

Fig.2 - This is a table showing us more in depth the frequency of the sums.

Analysis

Based on the results above we can say that my hypothesis was right. Based on the figure 1 and also figure 2 given above we can see that the sum of 12 was less frequent. This supports my hypothesis saying that the sum of 12 would be less likely due to the fact that there is only one way of getting this sum. The sum of 12 is only possible when rolling two 6's, this is why it makes it harder to appear as a sum. We can also see that 2 and also 3 were less frequent because they also have less numbers that add up to them which causes them to also have less probability just like the sum of 12. Overall the data gathered and the results presented support my hypothesis which is found in the introduction.

This experiment can be compared to other studies that have taken place. For example in the study "Dice Sums" it tells us that the probability of some sums is more likely to happen compared to other sums. In the text introduction it tells us "It is well known that a pair of six-sided dice has possible sums 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 with probabilities 1/36, 2/36, 3/36, 4/36. 5/36, 6/36, 5/36, 4/36, 3/26, 2/36, 1/36" (Rosin, 1). This is showing us that 7 has a higher probability than any other sum with a 6/36 chance of happening. This supports my data since 7 had the highest frequency in my data. This also showed us that 2 and 12 have the lowest probability, with both having a 1/36 chance of showing up. Moreover we can say that this study and my study can go hand to hand when it comes to dice sum probability.

Conclusion:

During this experiment we were able to explore the probability when it comes to the sum of rolling two dice. The information gathered showed us that some sums are more frequent than others. This study can help us in many different ways for the future, for example help us in machine learning and also be used to improve complex systems like weather forecast, market analysis, and predicting different outbreaks. This is very important because it can warn us of any dangers or any changes coming when it comes to outbreaks or just weather. Going into the future probability will be implemented more to help AI understand different patterns that happen in real life as well. Some other experiments that can be done with probability is the probability of tossing a coin, or the probability of teams winning a championship. Each of these experiments might have more depth than the other but at the end they will be using probability in them. Overall this study brought a lot of information when it comes to probability and it also made it clear why some sums of dice happen more often and the reason behind this.

Works Cited:

Rosin A, Sharobiem M, Swift R. Dice Sums. Mathematical Scientist. 2008;33(2):99-109.

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