

Writeup

In the following below, I will answer followup questions regarding my dreidel.c and play-dreidel.c program.

1. On average how long does a game of dreidel with 6 players, and 4 coins last? What is the longest and what is the shortest game?

A dreidel game with 6 players and 4 coins per player will typically last 400 rounds, with the shortest game being 26 rounds and the longest game being 2,539 rounds. To get these statistics, I typed out a bash script that runs the game 10,000 times with the seed ranging from 0 to 10,000 as the number of players and number of coins of players remain the same. Using gnuplot, I graphed out all the results with the horizontal axis being the number of rounds and the vertical axis being the frequencies of each of these rounds. Though not shown here, I also use some commands to calculate the average, low, and high, but the graph can likely accurately reflect on these results.

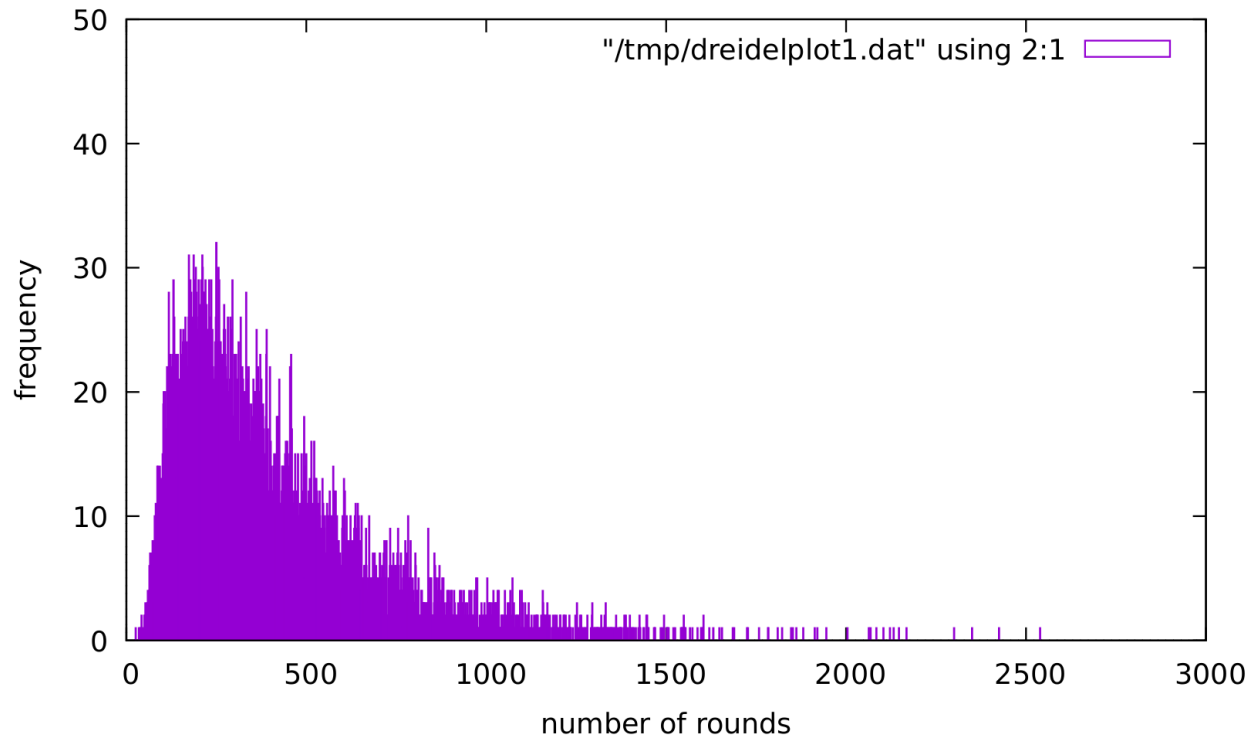


Figure 1: Frequency plot of rounds for 10,000 games.

2. If there are more players, does the game last more or fewer rounds? Experiment with 3 coins per player to test your data.

I used a bash script to run the game with 500 different seeds, each going from 2 to 8 players. According to the graph shown below, even though it's shown that there is a linear increase in duration of game relative to the number of players, this is not always true. I've tested certain seeds, and the duration has shown dips if at around 5 or 6 players. Take a look at figure 3 for example. We can also note that starting at 4 players, the dots in the upper half of the graph become more spread out and the bottom half become more dense. Even though durations are generally lower for 5-6 players, we can see that for some seeds, there are more durations of higher values, outliers. We could say that the number of rounds, relative to the players and seeds increases slowly with some fluctuations.

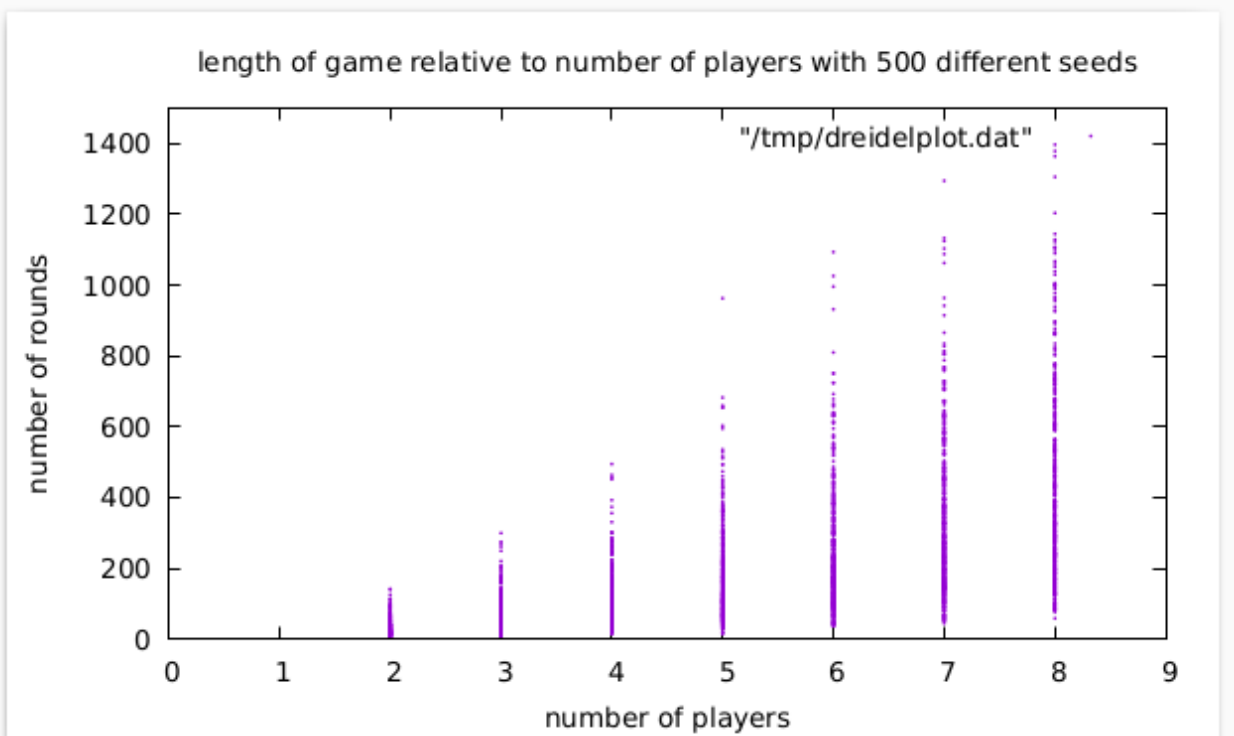


Figure 2: Length of game relative to number of players using 500 different seeds

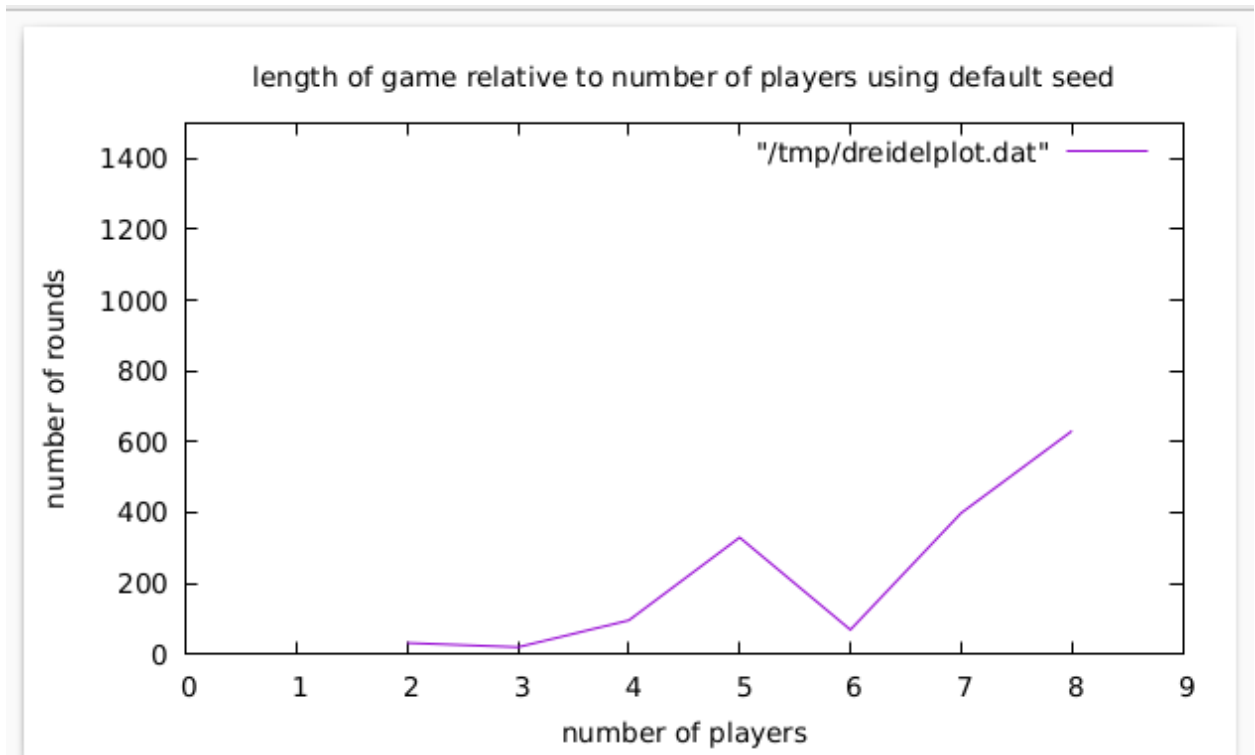


Figure 3: Duration of game relative to the number of players using seed 613.

3. Is there an advantage (or disadvantage) to position in a round? In other words, are players in a particular position more likely to win or lose a game.
- Although there isn't much bias in who is more likely to win, there are still some slight advantages and disadvantages. If we look at figure 4, player 1 (shown as 0 on the graph) is less likely to win. A possible reason is that on their first turn, they cannot get any coins at all since the pot is empty. Their only options are, depending on the outcome of the spin, to either do nothing or to lose 1 coin. This can become more significant, if they were to start with a lower number of coins. To prove this data, I ran the game with 1000 different seeds, with each game having from 2-8 coins. I tracked all the winners in a file, and found the frequencies of each of the winners. It seems as if player 2 (shown as player 1 on the graph) has a better chance of winning, but the advantage is not very significant. I have tested this with 10,000 games, and those cases hold true as well.

