Isaac Flores
Prof. Miller
CSE13S
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WRITEUP

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

On average a game of dreidel with 6 players and 4 coins last 401.6 rounds or 402 rounds if you round to the nearest whole number. The shortest game was 26 rounds and the longest was 2539 rounds. To find the average, I modified my play-dreidel.c file so that it would iterate 10,000 games with each game having a new seed in the range of [1, 10,000]. I added the length of each game to a total sum and divided it by the number of games played which was 10,000 in the end. I then printed out this number which was the average length of a game with 6 players and 4 coins. To get the lowest and highest, I used the same logic as the average but printed out the length of the game instead. I then wrote a bash script which wrote the length into a file and then sorted the data. I used uniq -c to get the frequency of each game length. I then plotted this data which you can see below. I used the sorted data file to find the shortest and longest game length since they were at the top and bottom of the sorted file.
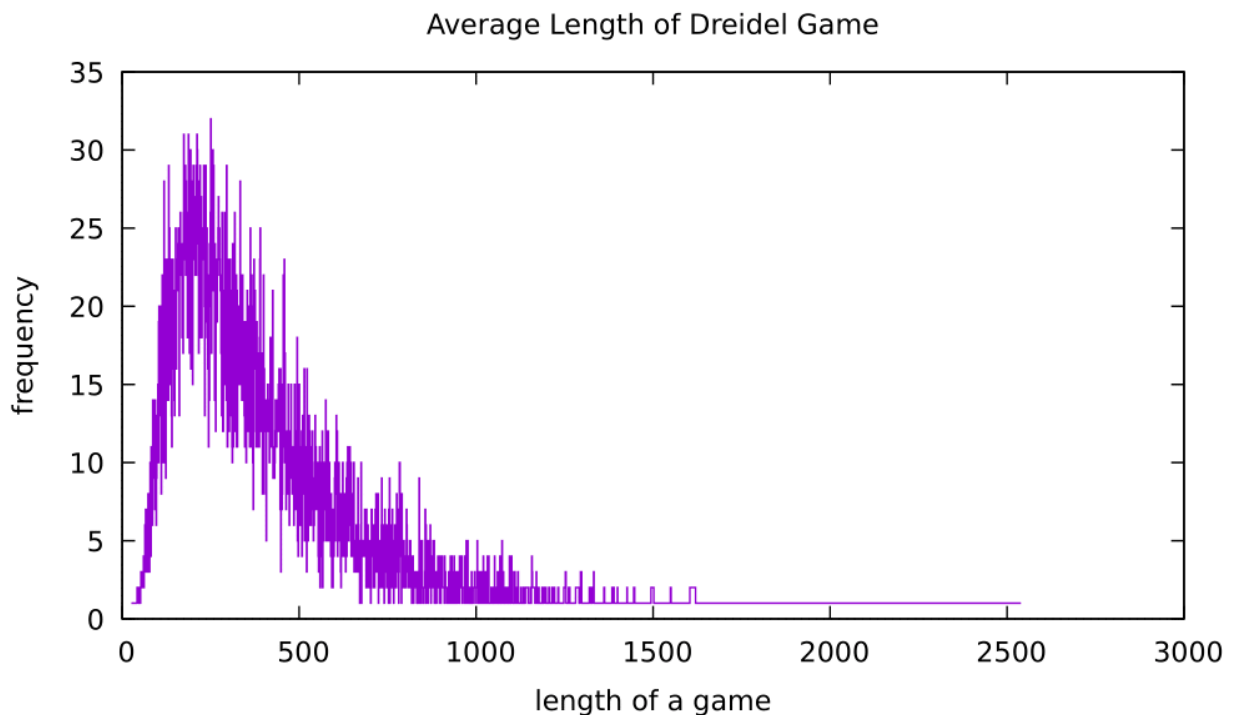
2. If there are more players, does the game last more or fewer rounds? Experiment with 3 coins per player to test your idea.

If there are more players, I assumed the length of the game would be longer since there would be more total coins in the game. This would bloat the length of the game since there are more opportunities for players to gain coins. My assumption was true since the data I plotted shows an increasing pattern for the game length when more players are added. To get this data, I used the same logic I used for the last answer but did it 7 times for each amount of players. After getting the average length of a game for each amount of players, I plugged the data into a .dat file and plotted it. The graph I produced is shown below.
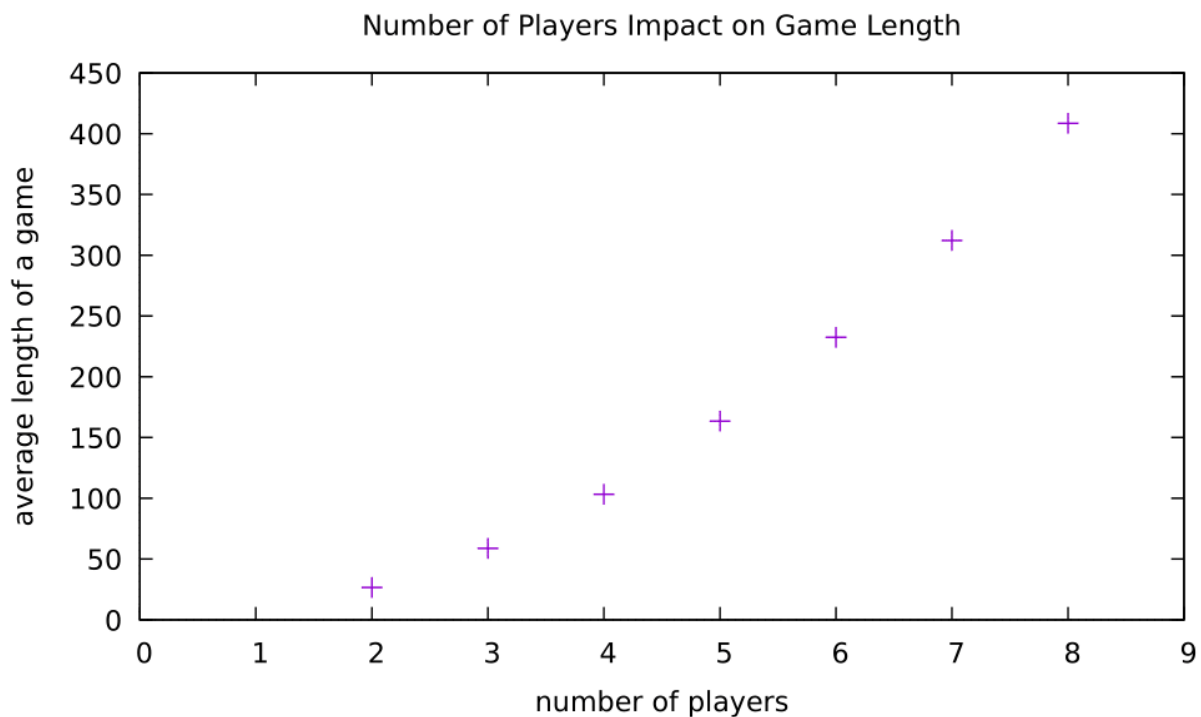
3. Is there an advantage (or disadvantage) to position in a round? In other words, are players in a particular position more likely to win or lose a game?

I thought that a player's position in a round wouldn't matter since it was arbitrary. I found that the 1st player in an 8-player game is most least to win. The likelihood increased from there up until the 7th position which peaks. The likelihood of winning decreases for the 8th player. To get this data I ran 10,000 games with each game having a seed in the range [1, 10000]. I then printed the index of the winner and added 1 since having a 0th player doesn't make sense. I copied this data through bash script into a .dat file. I sorted the data and used uniq -c to get the number of times each player won. I plotted this data and got the graph below. Although the 7th player is more likely to win than the 1st player, their chances aren't too different. The 7th player won about 13.2% of the games and the 1st player won about 11.6% of the games. The difference is by 1.6% which is not a noticeable difference.