Project #1
OpenMP: Monte Carlo Simulation

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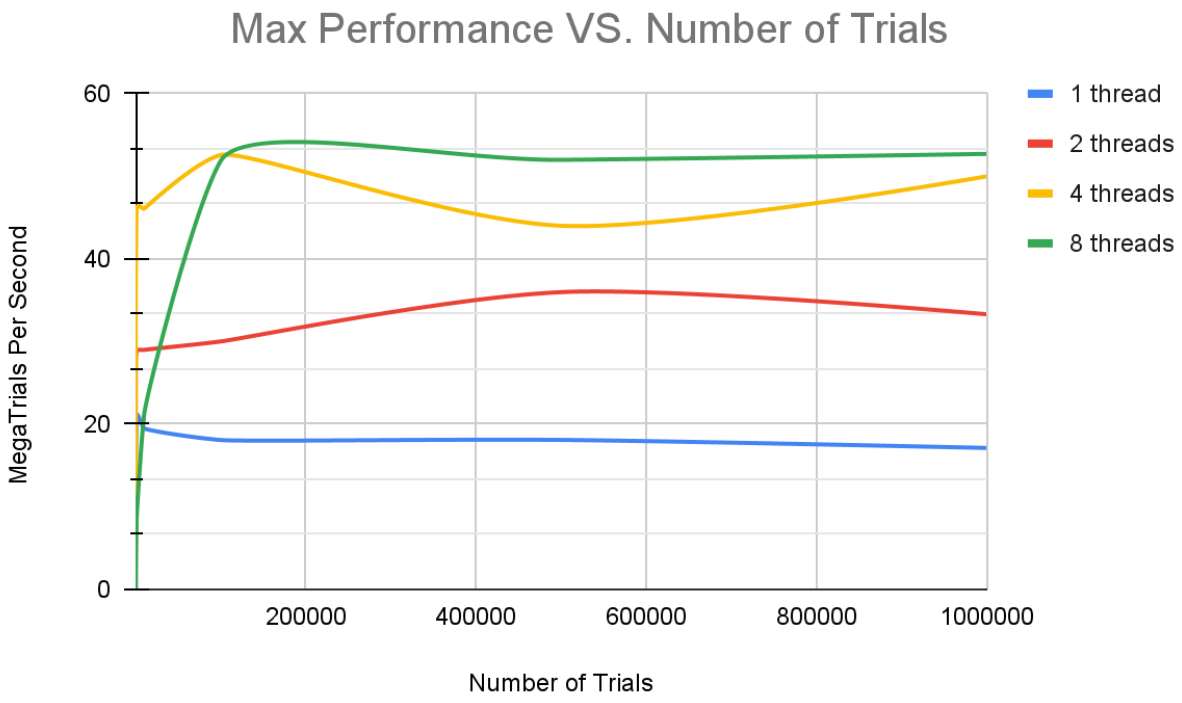
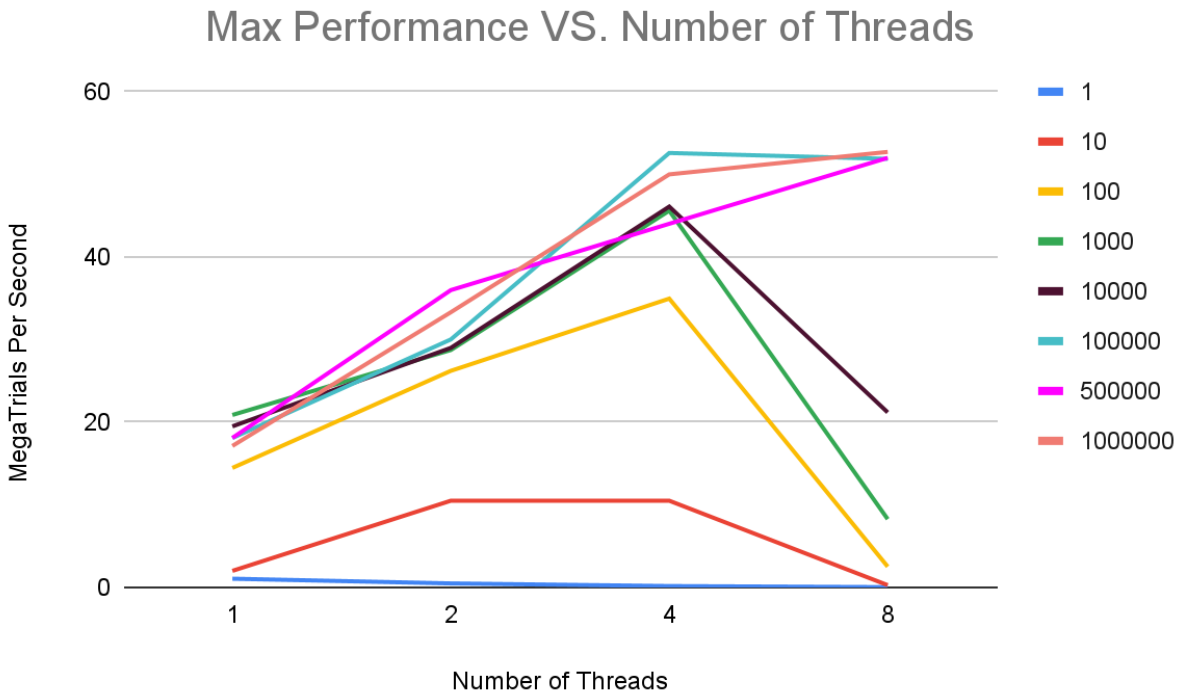
Table of Data:

	1	2	4	8
1	0	0	1.05	0.03
10	2	10.49	10.49	0.27
100	14.46	26.21	34.95	2.51
1000	20.87	28.73	45.59	8.26
10000	19.49	28.99	46.09	21.18
100000	18.08	30.01	52.58	51.87
500000	18.09	35.98	44.01	51.99
1000000	17.12	33.3	49.99	52.71

Graphs:





Probability:

The run I looked at was using 8 threads with 1000000 trials. Just at first glance I assumed the probability would come out to around 25% and I wasn't too far off. There was a consistent probability of 29% - 31% for all threads I tested with 1000000 trials. Given those results, you can assume there is ~30% chance of the snowball hitting the truck given the problem boundaries.

Parallel Fraction:

- First, find the 1 to 8 Speed Up:
  SP = (Performance with 8 threads) / (Performance with 1 thread)
  SP = 52.71 / 17.12 = 3.08
  SP = 3.08
- Use the **SP** to calculate the Parallel Fraction:
  n = 8, **SP** = 3.08
  FP = (n / (n - 1)) x (1 - (1/**SP**))
  FP = (8/7) x (1 - 0.3247)
  FP = (1.14)(0.6753) = 0.7698
  FP = 0.7698

Conclusion:

I ran multiple simulations with threads ranging from 1 to 32. The only reason I only used 1, 2, 4, and 8 on my graphs was because it made them less crowded. That being said, I saw the same probabilities with the higher number of threads as well. I also noticed that my FP for this project is similar to the one I calculated for the last project. I don't know why that is but I just made that observation.