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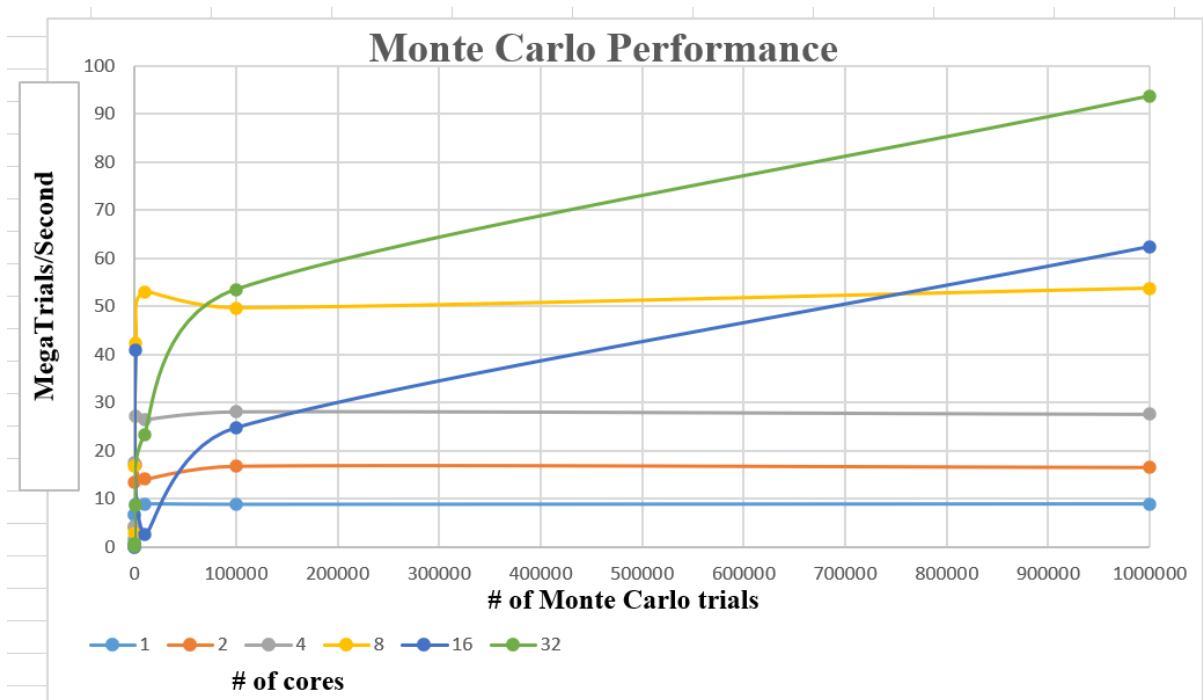
Project 1

1. Close estimate of the actual probability

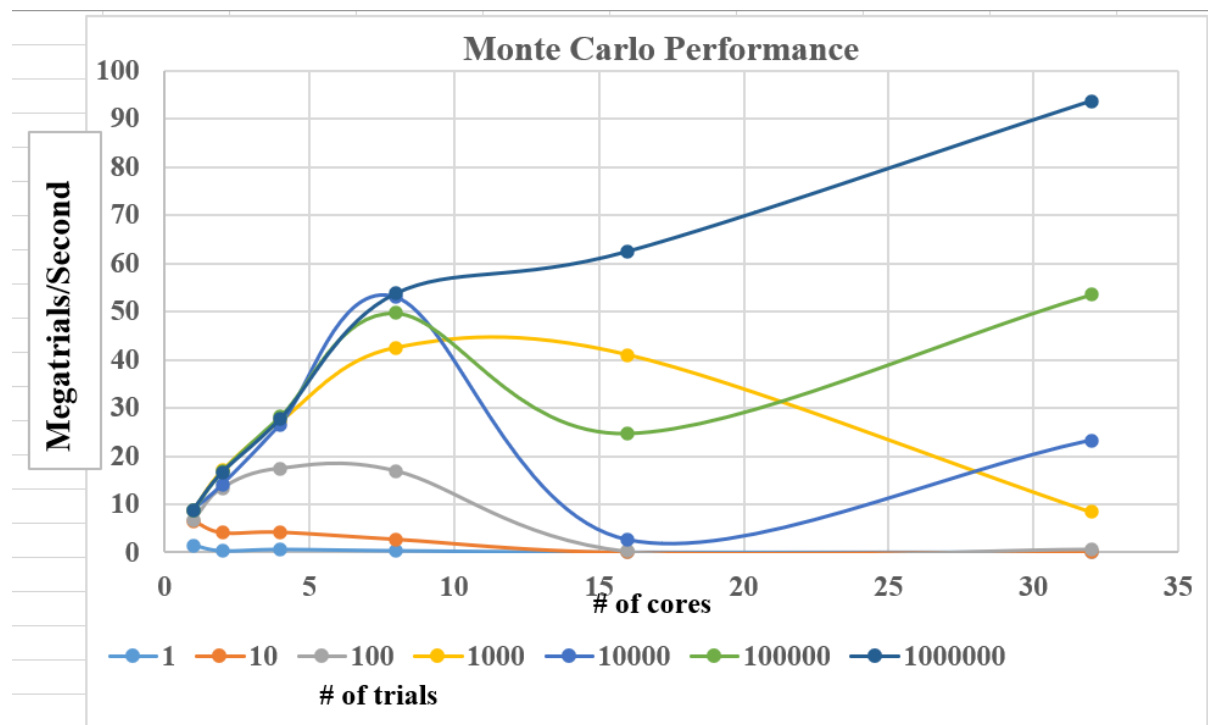
Probability: 6.87%

| | 1 | 10 | 100 | 1000 | 10000 | 100000 | 1000000 |
|----|------|------|-------|-------|-------|--------|---------|
| 1 | 1.49 | 6.54 | 6.62 | 8.71 | 8.82 | 8.71 | 8.79 |
| 2 | 0.3 | 4.1 | 13.36 | 16.97 | 14.03 | 16.77 | 16.53 |
| 4 | 0.59 | 4.2 | 17.39 | 27.18 | 26.49 | 28.14 | 27.62 |
| 8 | 0.32 | 2.75 | 16.86 | 42.44 | 52.99 | 49.65 | 53.72 |
| 16 | 0 | 0 | 0.25 | 40.97 | 2.59 | 24.76 | 62.46 |
| 32 | 0.01 | 0.13 | 0.71 | 8.45 | 23.29 | 53.47 | 93.73 |

2.



3.



4. $\text{float } F_p = (4/3) * (1 - (1/S))$.

So, first find $S = (\text{Performance with four threads}) / (\text{Performance with one thread})$

$$= 27.62 / 8.79$$

$$= 3.14$$

So, $F_p = (4/3) * (1 - (1/3.14)) = 0.91$