Project 1: OpenMP Monte Carlo Simulation

1. **Following table shows the performance recorded corresponding to the number of threads in number of trials:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Number of Threads | | | | | |
| Number of Trials | 1 | 2 | 4 | 6 | 8 | 10 |
| 1000000 | 17.27 | 34.51 | 67.29 | 82.88 | 73.57 | 91.46 |
| 5000000 | 17.41 | 34.36 | 67.58 | 100.56 | 134.94 | 111.24 |
| 10000000 | 17.68 | 34.85 | 66.21 | 101.44 | 134.64 | 166.78 |
| 20000000 | 17.56 | 34.92 | 67.34 | 101.63 | 134.64 | 165.36 |
| 40000000 | 17.69 | 34.58 | 67.59 | 101.01 | 135.42 | 168.62 |
| 60000000 | 17.66 | 34.53 | 67.76 | 101.37 | 134.13 | 168.54 |
| 80000000 | 17.67 | 34.76 | 67.63 | 100.99 | 134.6 | 168.97 |
| 100000000 | 17.61 | 34.48 | 67.69 | 101.58 | 133.47 | 168.51 |

1. **Following graphs show the performance vs number of trials and number of threads:**
2. **Chosing one of the runs (the one with the maximum number of trials would be good), tell me what you think the actual probability is.**

The probability is **0.19** for the run with maximum number of trials.

1. **Compute Fp, the Parallel Fraction, for this computation.**

Parallel Fraction:

Fp calculation would first require us to calculate the SpeedUp ‘S’:

S = (Peak performance of thread 8)/(Peak performance of thread 1)

Considering maximum number of trials for the calculation,

S= 168.51/17.61 = 9.57

Fp = (N/(N+1)) \* (1 – (1/S))

= (8/(8+1)) \* (1-(1/9.57))

= 0.80

Thus parallel fraction(Fp) = 0.80

The code was run on Flip server.