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CS 575

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1. What machine you ran this on

I ran this program on the Rabbit server.

1. What do you think this new probability is?

The new probability will be same or similar to the previous probability and be around 80%.

1. Show the rectangular table and the two graphs

|  |  |  |  |
| --- | --- | --- | --- |
| Number of trials | BlockSize | MegaTrialsPerSecond | Probability |
| 1024 | 8 | 7.1701 | 85.06 |
| 1024 | 32 | 11.5649 | 84.77 |
| 1024 | 64 | 9.774 | 82.52 |
| 1024 | 128 | 10.9627 | 83.5 |
| 1024 | 256 | 8.8766 | 85.16 |
| 4096 | 8 | 43.2286 | 84.25 |
| 4096 | 32 | 44.3213 | 83.89 |
| 4096 | 64 | 48.3201 | 84.03 |
| 4096 | 128 | 47.958 | 83.59 |
| 4096 | 256 | 50.8946 | 83.28 |
| 16384 | 8 | 166.2878 | 83.78 |
| 16384 | 32 | 199.2218 | 84.32 |
| 16384 | 64 | 200.8631 | 83.76 |
| 16384 | 128 | 202.933 | 83.76 |
| 16384 | 256 | 199.9219 | 84.15 |
| 65536 | 8 | 495.5238 | 83.66 |
| 65536 | 32 | 695.1799 | 83.95 |
| 65536 | 64 | 677.9212 | 83.71 |
| 65536 | 128 | 512 | 83.96 |
| 65536 | 256 | 495.6438 | 83.81 |
| 262144 | 8 | 862.4065 | 83.83 |
| 262144 | 32 | 1692.562 | 83.79 |
| 262144 | 64 | 2006.3678 | 83.86 |
| 262144 | 128 | 1799.2532 | 83.83 |
| 262144 | 256 | 2033.2588 | 83.85 |
| 1048576 | 8 | 1153.6809 | 83.84 |
| 1048576 | 32 | 2938.0435 | 83.76 |
| 1048576 | 64 | 4000.9766 | 83.81 |
| 1048576 | 128 | 2074.1865 | 83.77 |
| 1048576 | 256 | 5115.2046 | 83.85 |
| 2097152 | 8 | 1199.4583 | 83.79 |
| 2097152 | 32 | 3648.5916 | 83.79 |
| 2097152 | 64 | 5411.726 | 83.8 |
| 2097152 | 128 | 6803.9869 | 83.8 |
| 2097152 | 256 | 5747.7637 | 83.77 |

1. What patterns are you seeing in the performance curves?

From the curves, we can see that the performance of the system increases as we increase the block size. As we can expect from the performance, as the block size increases the MegaTrialsPerSecond also increases.

1. Why do you think the patterns look this way?

As the number of blocks increase, the number of calculations that can be done by each block also increases, this in turn improves the efficiency.

1. Why is a BLOCKSIZE of 8 so much worse than the others?

With the blocksize as just 8, the number of calculations that can be done are limited to those 8 blocks and this reduces the efficiency.

1. How do these performance results compare with what you got in Project #1? Why?

The results are similar to the ones in project 1, but for the blocksize 256, the performance peaks and decreases for the last set of trials, as the issue of computational overhead makes it less efficient.

1. What does this mean for what you can do with GPU parallel computing?

This shows that even though GPU computing can achieve somewhat similar result as CPU computing, but as the number of trials increase and the need for blocks increases, the resources required and the computational overhead block GPU computing from being equal to CPU computing.