Project #0
Simple OpenMP Experiment

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1. What machine I ran this on:

   I ran this on my MacBook Pro running on OS Monterey version 12.0.1:
   CPU: 2 GHz Dual-Core Intel Core i5
   Memory: 8 GB 1867 MHz LPDDR3

2. Performance Results:

   I ran with an array size of 16384 and 100 tries, here are my 1-thread and 4-thread results:

```
Using 1 threads
Peak Performance =   282.80 MegaMults/Sec
```

```
Using 4 threads
Peak Performance =   687.19 MegaMults/Sec
```

3. 4-thread to 1-thread SpeedUp:

   S = (Performance with 4-threads) / (Performance with 1-thread)
   S = (687.19) / (282.80)
   S = 2.43

4. If Speed-up is less than 4, why is that?

   Judging from the equations, you would assume 4-threads to have 4 times the performance of 1-thread. This would mean the speed-up would be equal to 4 but mine is not. My assumption is that it has something to do with my mac system. If there are other programs running on my system(which there is), they would need to share the processors causing the speed-up to not be 4.

5. Parallel Fraction:

   S = 2.43
   Fp = (4 / 3) x (1 - (1 / **S**)
   Fp = (4 / 3) x (1 - (1 / 2.43)
   Fp = (1.33) x (1 - .4115)
   Fp = (1.33) x (.5885)
   Fp = .7827