

# CS 575

## Project #5

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## 1. What machine you ran this on

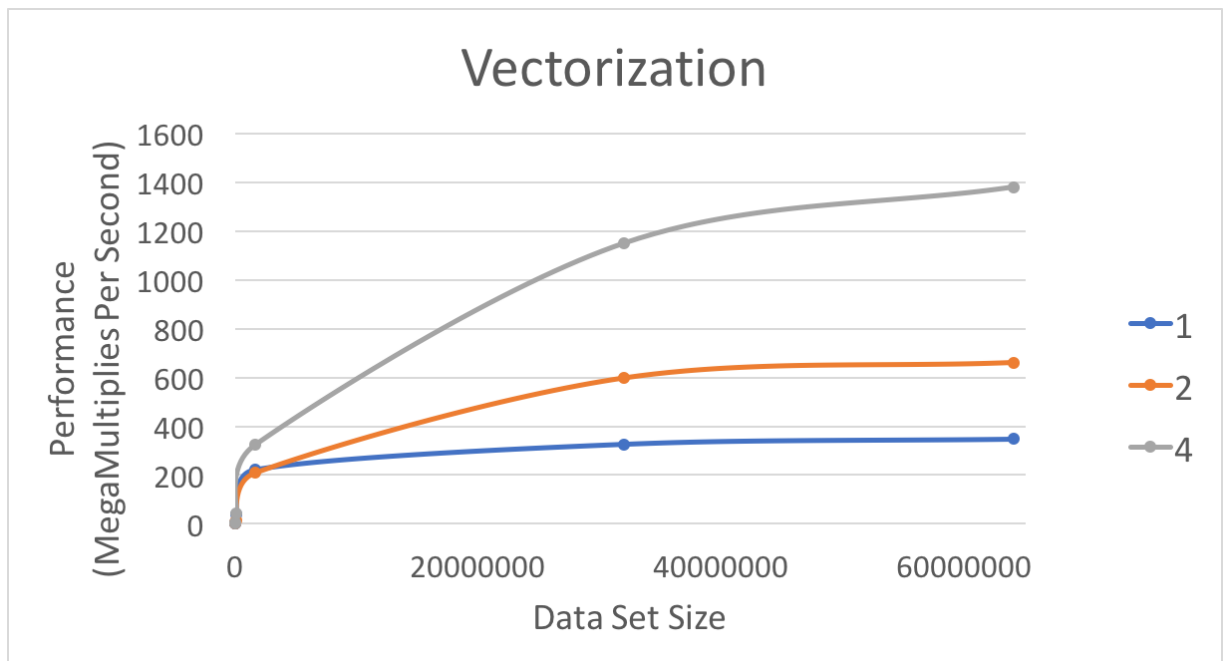
I use rabbit to run my code.

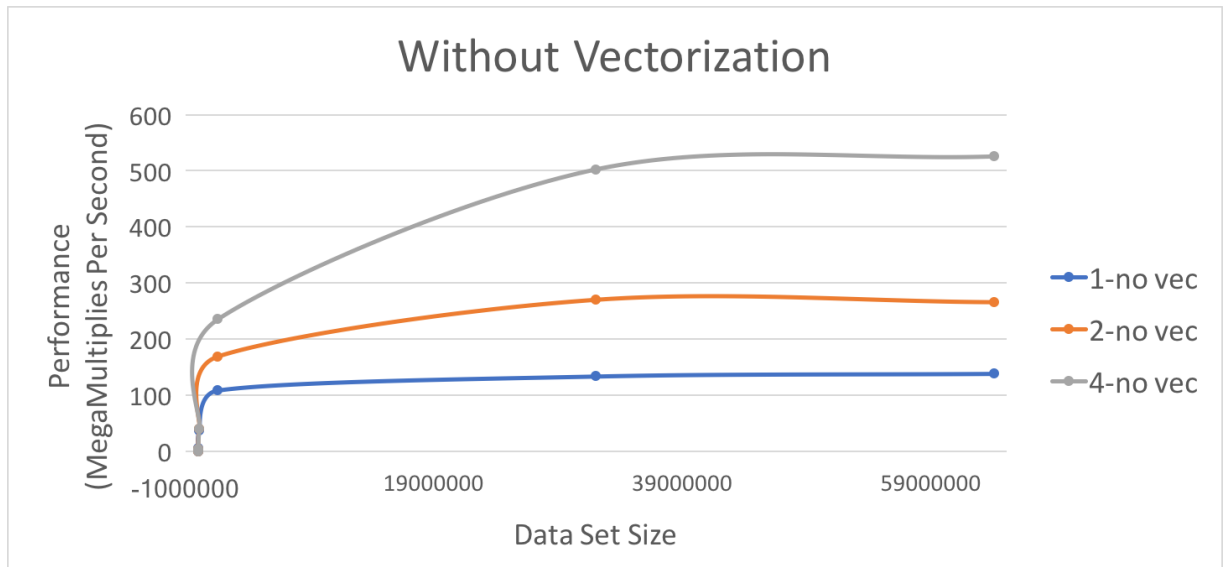
## 2. Show the tables and graphs

Vectorization						
NUMT\NUMS	1000	10000	100000	1600000	32000000	64000000
1	0.37	1.55	39.9	221.54	326.43	347.47
2	0.48	3.89	13.4	208.06	597.14	660.15
4	0.14	3.56	43.36	323.31	1151.91	1381.9

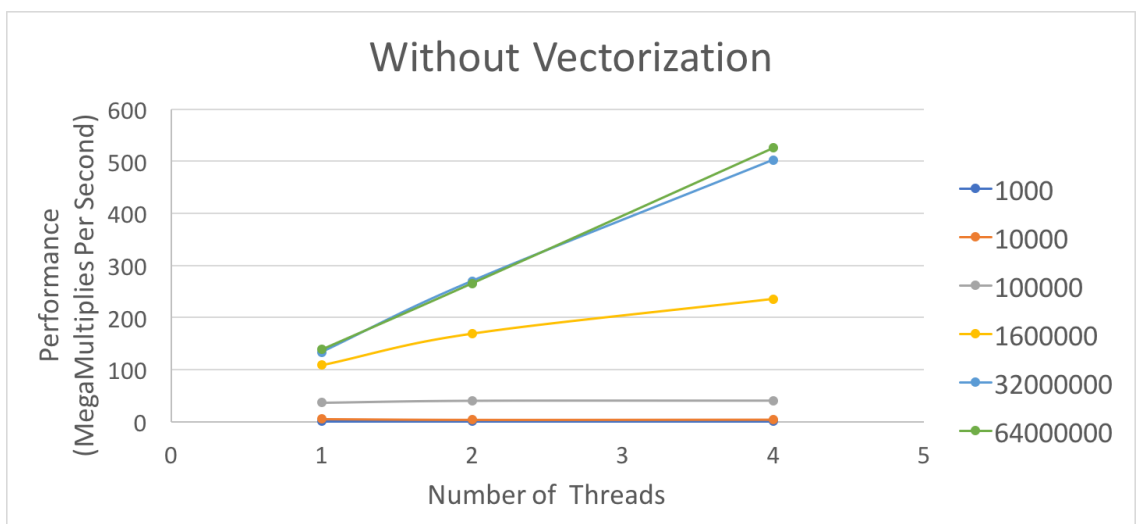
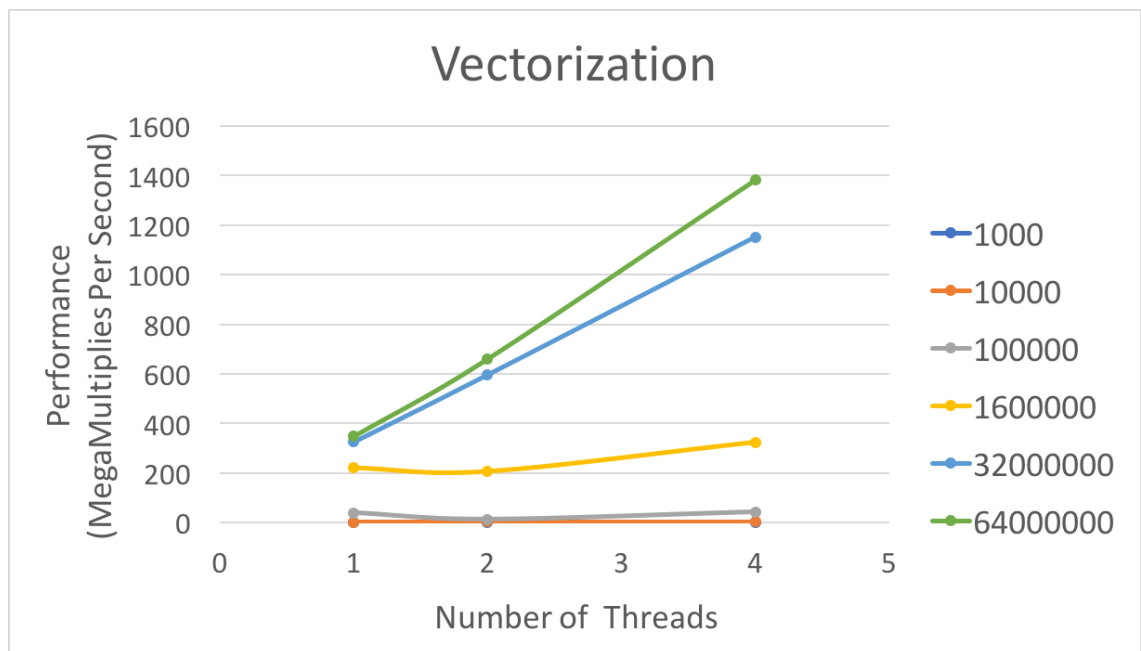
Without Vectorization						
NUMT\NUMS	1000	10000	100000	1600000	32000000	64000000
1	0.53	5.54	36.91	108.84	133.84	138.6
2	0.49	3.72	40.23	169.12	270.17	265.87
4	0.44	4.17	40.52	235.49	502.51	525.69

- Performance versus NUMS with constant-NUMT curves.





- Performance versus NUMT with constant-NUMS curves.



**3. What patterns are you seeing in the performance curves? (Pay special attention to what the curves are doing at the far end of NUMS.)**

The above graphs show that a program with vectorization will performed better than the non-vectorization one. Due to the first two data sets are smaller than others, the performance is not significance enough for us to compare; however, in the graphs of performance versus NUMS, at the far end of the NUMS, when the size of data set increases, the line in vectorization's graph is likely to keep increasing, in contrast, we could see that the line without vectorization is starting to level off.

**4. Why do you think the patterns look this way?**

Because with the same instruction and the independency of the data, the larger the data set is, the better the performance will be for a vectorized program. If the data set is too small, the advantage of using SIMD will be shaded by its additional works.

**5. What does that mean for the proper use of vectorized parallel computing?**

If we have an independent and small data set size program, we should not be considering using vectorization as our solution for increasing the performance, otherwise the benefit of using it will be shaded by its additional works. However, when we have a large and independent data set, SIMD could have a better performance.