

CS205 hw5

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1

1.1

First let's calculate the peak performance. This is calculated as $\text{Cores} \times \text{Frequency} \times \text{FLOPS per cycle per core}$. That is equal to: $18 \text{ cores} * 3.3 \text{ GHz} * 16 \text{ FLOPs/cycle} = 950.4 \text{ GFLOP/s}$.

For the memory bandwidth, I used STREAM, which calculated that the memory bandwidth is 12569.4 MB/s or 12.28 GB/s or 3147 GFLOP/s. Below is the plot.

1.2

My best performance result is 239 GFLOPS/s. In my approach, I've used `KERNEL_FLOPS` ($1000000.0 * (8.0 + 8.0)$) as `NLOOP * (ADD + MUL)` and $18 \text{ cores} * 3.3 \text{ GHz} * 16 \text{ FLOPs/cycle} = 950.4 \text{ GFLOP/s}$. Memory bandwidth could potentially be bottlenecking my speed, since I have high throughput from vectorized operations

1.3

Percentage is 25.2%.

2

2.1

37364.7 ms

2.2

79.2 ms

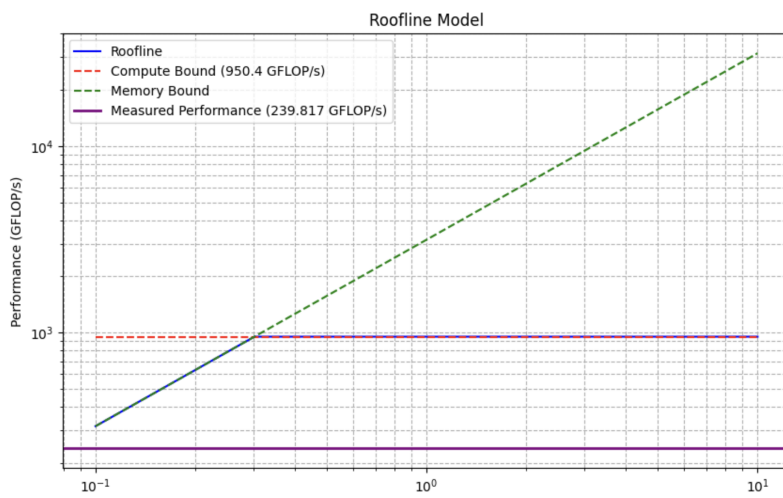


Figure 1: Roofline Model

2.3

79.4 ms