



Oregon State University

CS 575 - INTRO TO PARALLEL PROGRAMMING

Project 00

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1. I run this code on flip2 machine.

2.

```
flip2 ~/class/C575/Projects/p00 1015$ bash loop.bash
OpenMP version 201511 is supported here
For 1 thread, Peak Performance = 438.27 MegaMults/Sec
OpenMP version 201511 is supported here
For 4 threads, Peak Performance = 1520.98 MegaMults/Sec
```

3.

```
flip2 ~/class/C575/Projects/p00 1015$ c++ calc.cpp
flip2 ~/class/C575/Projects/p00 1016$ ./a.out
Speedup (S): 3.47042
```

4. According to Amdahl's Law, the main reason is that no matter how fast we make the parallel portion of the code, the overall performance will always be limited by the serial part [1]. Since the code contains a small amount of serial execution, it will never reach the ideal speedup of 4. Additionally, factors such as thread creation overhead, the cost of entering the `#pragma omp parallel` region, and cache sharing between CPU cores also contribute to the performance loss.

5.

```
Parallel fraction (Fp): 0.949134
```

Reference:

1. Robey, R., & Zamora, Y. (2021). Parallel and High Performance Computing. Manning Publications.