2023 21级第一次学习任务

本次学习任务分为：task1 和 task2 选择一项完成即可

难度：task2 > task1

Deadline: 3.30

深入学习1

TASK 1

1. 向量化的再学习

- Data Alignment to Assist Vectorization：

https://www.intel.com/content/www/us/en/developer/articles/technical/data-alignment-to-assist-vectorization.html

- 玩转SIMD指令编程：

https://zhuanlan.zhihu.com/p/591900754

- Intrinsics for Intel® Advanced Vector Extensions 512 (Intel® AVX-512) Instructions

https://www.intel.com/content/www/us/en/develop/documentation/cpp-compiler-developer-guide-and-reference/top/compiler-reference/intrinsics/intrinsics-for-avx-512-instructions.html

（以上的资料都蛮好的）

2. MPI的基础练习

51. 进程间消息的发送与接收（MPI）

https://www.easyhpc.net/problem/programming/51

53. 根进程对子进程的广播（MPI）

https://www.easyhpc.net/problem/programming/53

52. 集合通信（MPI）

https://www.easyhpc.net/problem/programming/52

62. 归约操作（MPI）

https://www.easyhpc.net/problem/programming/62

76. 进程间互相发送数据（MPI）

https://www.easyhpc.net/problem/programming/76

127. 利用MPI_Bcast并行规约求和

https://www.easyhpc.net/problem/programming/127

155. 基于MPI_Scatter的数据分发

https://www.easyhpc.net/problem/programming/155

3. Openmp的练习

372. Homework 3 使用openmp找出矩阵最大值和最小值

https://www.easyhpc.net/problem/programming/372

403. Homework 4 使用OpenMp实现Count_sort函数

https://www.easyhpc.net/problem/programming/403

ps. 完成的较快的同学可以去学学CUDA

https://www.bilibili.com/video/BV1dq4y1k7RD/?spm_id_from=333.337.search-card.all.click&vd_source=d4d8725a1a30e189fa2cd9218fa9842a （这个感觉讲的蛮基础的）

TASK 2

CMU - Parallel Computer Architecture and Programming

https://www.cs.cmu.edu/afs/cs/academic/class/15418-s22/www/projects.html

Fall 2022 Assignment 1

15-418/618, Fall 2021
Assignment 1
Exploring Multi-Core, Instruction-Level, and SIMD Parallelism

Event	Registered students
Assigned:	Friday, Sept. 3
Due:	Monday, Sept. 13, 11:59 pm
Last day to handin:	Thursday, Sept. 16 11:59 pm

Fall 2022 Assignment 3

15-418/618 Fall 2021

Assignment 3
Parallel VLSI Wire Routing via OpenMP

Assigned: Monday, September 27th
Due: Wednesday, October 13th, 11:59PM
Last day to handin: Friday, October 15th, 11:59PM

This assignment aims to introduce you to parallel programming using OpenMP and illustrate how the realities of parallel machines affect performance. Although the sequential version of the task you are asked to parallelize is relatively straightforward, there are a number of subtle issues involved in achieving high performance with your parallel code.

ps. 完成的较快的同学可以接着做 Assignment 2,4