HW8.4. How To Parallelize

At this point, we have discussed 2 levels of parallelism:

- Parallelism of data (ex. SIMD instructions), which has low overhead, but is limited by a small set of possible operations.
- Parallelism of threads/processes (ex. OpenMP), which has high overhead (often on the order of thousands of normal operations), and generally requires splitting the problem into several independent problems to avoid data races, but is generally more versatile than SIMD.

For each of the following programming problems, determine the most appropriate parallelism method, or indicate that neither method of parallelism would be useful. If both methods of parallelism are useful, answer with "Thread-level Parallelism"

Q1.1: You want to compute the average number of white pixels per frame of a 3 minute video

- ○ (a) Neither method of parallelism is useful.
- ○ (b) Data-level Parallelism
- ○ (c) Thread-level Parallelism

Q1.2: You want to compute the bitwise XOR of two buffers, each of which is 512 bytes long.

- ○ (a) Neither method of parallelism is useful.
- ○ (b) Data-level Parallelism
- ○ (c) Thread-level Parallelism

Q1.3: You want to search a sorted list of a million integers for a specific value.

- ○ (a) Neither method of parallelism is useful.
- ○ (b) Data-level Parallelism
- ○ (c) Thread-level Parallelism

Q1.4: You want to run Snake on a 10,000 x 10,000 board with 100,000 active food pellets and 3 snakes.

- ○ (a) Neither method of parallelism is useful.
- ○ (b) Data-level Parallelism
- ○ (c) Thread-level Parallelism

Q1.5: You want to run `dot` on two vectors of length 100, with stride lengths 1 and 2.

- ○ (a) Neither method of parallelism is useful.
- ○ (b) Data-level Parallelism
- ○ (c) Thread-level Parallelism

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Homework 8

Assessment overview

Total points: 0/100

Score: 0%

Question

Value: 10

History:

Awarded points: 0/10

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