

CS 110 Discussion 16

Programming with OpenMP

Yanjie Song

School of Information Science and Technology

May 9, 2020

Table of Contents

- 1 Introduction on OpenMP
- 2 OpenMP Directives and Constructs
- 3 Intel(R) VTune Profiler

Table of Contents

- 1 Introduction on OpenMP
- 2 OpenMP Directives and Constructs
- 3 Intel(R) VTune Profiler

Introduction on OpenMP

OpenMP is a standard for shared memory programming adopted by many hardware vendors.

Can be used with different languages, e.g. C, C++ and Fortran.

OpenMP Specifications and Docs

- [OpenMP 5.0 Specification](#)
- [OpenMP 5.0 Reference Guides](#)
- [GNU Offloading and Multi Processing Runtime Library Manual](#)

Table of Contents

- 1 Introduction on OpenMP
- 2 OpenMP Directives and Constructs**
- 3 Intel(R) VTune Profiler

Worksharing-loop construct

```
#pragma omp for schedule(kind[, chunk])
```

```
...
```

The kind can be one of the following:

- static
- dynamic
- guided
- auto
- runtime

Synchronization constructs

- **critical**: Restricts execution of the associated structured block to a single thread at a time.
- **barrier**: Specifies an explicit barrier that prevents any thread in a team from continuing past the barrier until all threads in the team encounter the barrier.

Table of Contents

- 1 Introduction on OpenMP
- 2 OpenMP Directives and Constructs
- 3 Intel(R) VTune Profiler

Sometimes it is difficult to detect performance bottleneck just by looking at the code.

We will need some tools to help us out.

Stop guessing why software is slow. Advanced sampling and profiling techniques quickly analyze your code, isolate issues, and deliver insights for optimizing performance on modern processors.