Introduction to High Performance Computing

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SDS406 – Fall semester, 2024 - 2025

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L14: Summary and revision, 17^{th} January 2025

Index

Revision of SDS406

- Lessons 1 — 12
- Assignments

Lessons 1 — 12

- `Lesson 01` :: **Introduction** — Using the cluster, simple C programming
- `Lesson 02` :: **Introduction** — Using Slurm, C refresh, computing π
- `Lesson 03` :: **OpenMP** — Introduction to OpenMP
- `Lesson 04` :: **Optimization** — Counting flops and I/O, arithmetic intensity
- `Lesson 05` :: **GPUs** — Introduction, `axpy` on the GPU
- `Lesson 06` :: **GPUs** — Using shared memory, warps
- `Lesson 07` :: **GPUs** — Continued, matrix-vector multiplication
- `Lesson 08` :: **MPI** — Introduction, collectives & point-to-point
- `Lesson 09` :: **MPI** — Heat equation example, exchanging boundaries
- `Lesson 10` :: **MPI** — Custom MPI types and MPI-I/O
- `Lesson 11` :: **MPI** — Continued, custom MPI types, MPI-I/O in heat equation code
- `Lesson 12` :: **More Optimization** — MPI+OpenMP, heat equation code

Assignments

- `Assignment 1` :: 1-dimensional convolution with OpenMP
- `Assignment 2` :: Down-scaling an image on the GPU