Profiling with NVIDIA Nsight Compute

Hands-on

Resources

- Already profiled files are available here:
  https://bwsyncandshare.kit.edu/s/kHXHmzBHxia7r7B
- If you want to follow along, download the spmv-profiling.zip file, unzip it and open the spmv-profiling.ncu-proj file in NVIDIA Nsight Compute.
- Clone the driver repo here:
  https://gitlab.com/pratikvn/profiling-hands-on
- You can download NSight Compute here:
  https://developer.nvidia.com/nsight-compute
- Profiling guide:
  https://docs.nvidia.com/nsight-compute/ProfilingGuide/index.html

Cage 14

vanHeukelum/cage14

DNA electrophoresis, 14 monomers in polymer. A. van Heukelum

Name	cage14
Group	vanHeukelum
Matrix ID	915
Num Rows	1,505,785
Num Cols	1,505,785
Nonzeros	27,130,349
Pattern Entries	27,130,349
Kind	Directed Weighted Graph
Symmetric	No
Date	2003
Author	A. van Heukelum
Editor	T. Davis
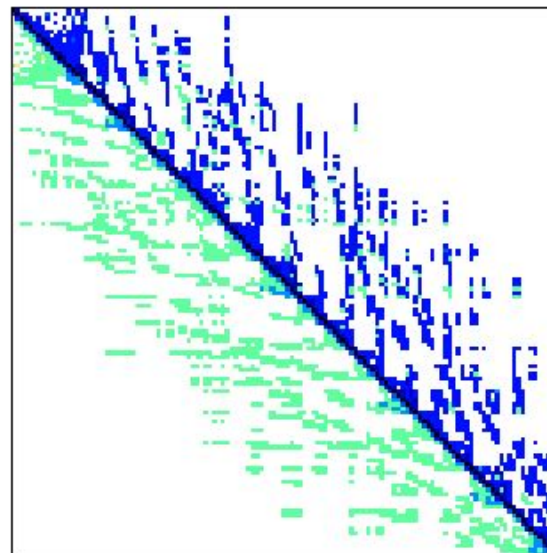
Apache 2

SPD matrix (finite difference 3D) from APACHE small

Name	apache2
Group	GHS_psdef
Matrix ID	1423
Num Rows ❓	715,176
Num Cols ❓	715,176
Nonzeros ❓	4,817,870
Pattern Entries ❓	4,817,870
Kind ❓	Structural Problem
Symmetric ❓	Yes
Date ❓	2006
Author ❓	
Editor ❓	N. Gould, Y. Hu, J. Scott
Structural Rank	715,176
Structural Rank Full	true
Num Dmperm Blocks ❓	1
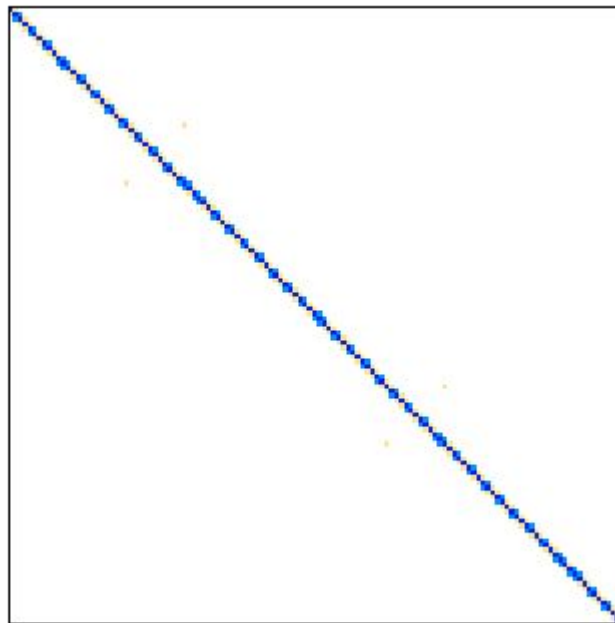
Run the executable on the cluster

```
> PROFILE_OPTIONS="--section SpeedOfLight --section Occupancy
--section WarpStateStats --section ComputeWorkloadAnalysis --section
MemoryWorkloadAnalysis --section SchedulerStats --section
SourceCounters --section SpeedOfLight_RooflineChart"


> ncu ${PROFILE_OPTIONS} -o spmv-profiling -f /path/to/run_spmv \
--matrix="path/to/mtx" --strategy="block_parallel"
```

Run Nsight Compute on your system

> ncu-ui &