Exercise 6

Programming SS 2019 - Problem Set 4

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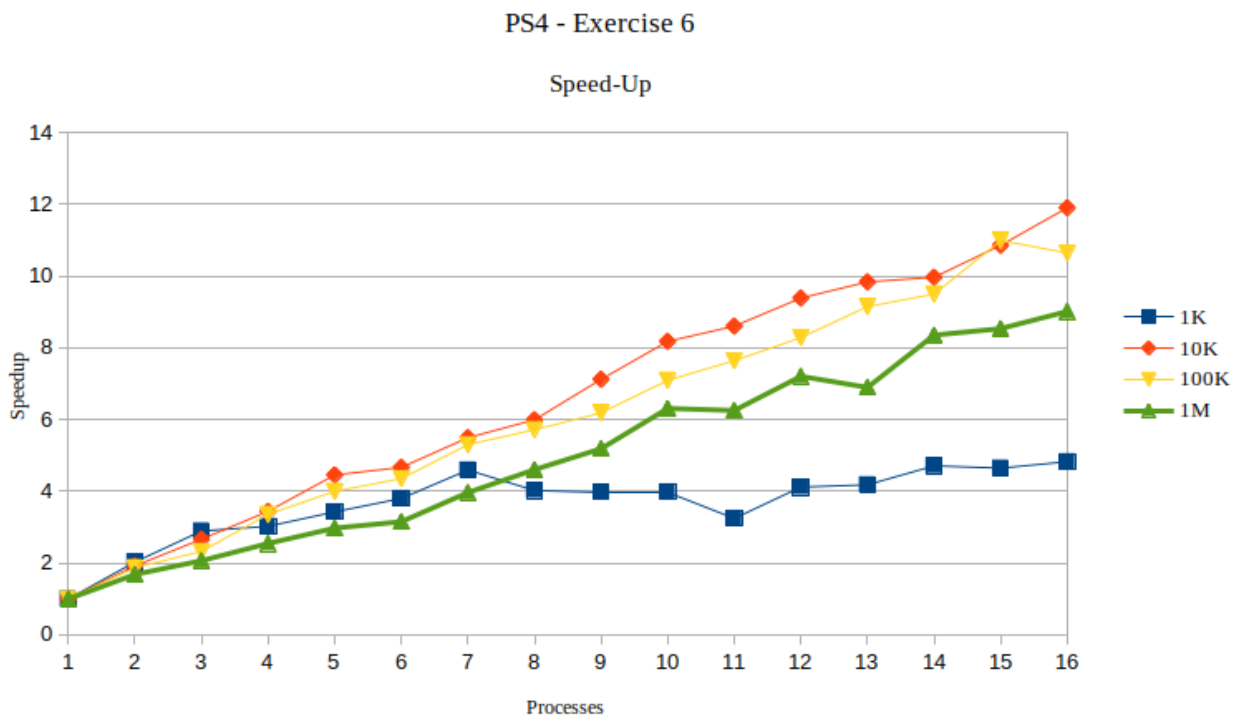
We are asked to check the speed-up for combinations of MPI processes and sample points using one node on *Alphacruncher*.

Speed-up in latency is calculated as follow:

$$S = \frac{t_{old}}{t_{new}}$$

In our case, t_{old} is the runtime with **one** thread.



Note1 : The exercise asks to try combination of MPI processes between 1 & 20. However, we noticed that jobs submitted with more that 16 processes would not start;

- status *PD* (pending) and node reason *Ressources*.
- We assume that Alphacruncher doesn't allow us to go above 16 tasks in parallel.
- It is probable that the session used (*intq*) is not capable to provide enough resources as the output of the command `scontrol show part` shows (`TotalCPUs=16`) :

```
PartitionName=intq
   AllowGroups=compute_partitions_all,compute_partitions_intq AllowAccounts=ALL AllowQos=ALL
   AllocNodes=ALL Default=NO QoS=N/A
   DefaultTime=NONE DisableRootJobs=NO ExclusiveUser=NO GraceTime=0 Hidden=NO
   MaxNodes=UNLIMITED MaxTime=04:00:00 MinNodes=1 LLN=NO MaxCPUsPerNode=UNLIMITED
   Nodes=gpu01
   PriorityJobFactor=1 PriorityTier=1 RootOnly=NO ReqResv=NO OverSubscribe=NO
   OverTimeLimit=0 PreemptMode=OFF
   State=UP TotalCPUs=16 TotalNodes=1 SelectTypeParameters=NONE
   JobDefaults=(null)
   DefMemPerNode=UNLIMITED MaxMemPerNode=UNLIMITED
```

Note2: Execution outputs are stored in *Exercise6/output/*.