

Lukasz Zajac lab 3 assignment

Task 1: Obtain the image set which will serve as input for processing

1. A set of 1000 images are available at the following path:
/net/pr2/projects/plgrid/plgglscclclass/image_data_sets/data/training_images/
2. Copy the images to a new directory in \$SCRATCH.

```
[ares][plgqesterius@login01 plgqesterius]$ cp /net/pr2/projects/plgrid/plgglscclclass/image_data_sets/data/training_images/* -d images
[ares][plgqesterius@login01 plgqesterius]$
[ares][plgqesterius@login01 plgqesterius]$ ls
images slurm_jobdir
[ares][plgqesterius@login01 plgqesterius]$ cd images
[ares][plgqesterius@login01 images]$ ls
vid_4_10000.jpg vid_4_13020.jpg vid_4_17940.jpg vid_4_21420.jpg vid_4_26320.jpg vid_4_600.jpg
vid_4_1000.jpg vid_4_13040.jpg vid_4_17860.jpg vid_4_21440.jpg vid_4_26340.jpg vid_4_6080.jpg
vid_4_10020.jpg vid_4_13060.jpg vid_4_17880.jpg vid_4_21460.jpg vid_4_26360.jpg vid_4_6100.jpg
vid_4_10040.jpg vid_4_13080.jpg vid_4_17900.jpg vid_4_21480.jpg vid_4_26380.jpg vid_4_6120.jpg
vid_4_10060.jpg vid_4_13100.jpg vid_4_17920.jpg vid_4_21500.jpg vid_4_26400.jpg vid_4_6140.jpg
vid_4_10080.jpg vid_4_13120.jpg vid_4_17940.jpg vid_4_21520.jpg vid_4_26420.jpg vid_4_6160.jpg
vid_4_10100.jpg vid_4_13140.jpg vid_4_17960.jpg vid_4_21540.jpg vid_4_26440.jpg vid_4_6180.jpg
vid_4_10120.jpg vid_4_13160.jpg vid_4_17980.jpg vid_4_21560.jpg vid_4_26460.jpg vid_4_6200.jpg
vid_4_10140.jpg vid_4_13180.jpg vid_4_18000.jpg vid_4_21580.jpg vid_4_26480.jpg vid_4_6220.jpg
vid_4_10160.jpg vid_4_14040.jpg vid_4_1800.jpg vid_4_21600.jpg vid_4_26500.jpg vid_4_6220.jpg
```

Task 2: Create `converter.sh` script for image conversion using ImageMagick

1. The conversion command using ImageMagick is:

```
magick convert -adaptive-resize 3840x2160 -adaptive-sharpen 10 <input> <output>
```

2. Each image should take about 30 seconds to process.
3. The script should:
Be done in Bash or any other scripting language.
Take imagename as an argument. The output can be determined based on the input file or provided as a second parameter.
4. It is best to test the conversion inside of an interactive job to avoid stressing the login nodes.
Refer to Lab02 for an example on how to start an interactive job in the plgrid-now partition.

converter.sh

```
magick convert -adaptive-resize 3840x2160 -adaptive-sharpen 10 $SCRATCH/images/$1 output/$1
```

Task 3: Create a job script and execute it, the job should:

1. Process in parallel multiple images inside of a single job
2. Use the converter script from previous point
3. Parallelization should be done using xargs ... srun combination
4. Determine the proper -P parameter for xargs
5. Determine the proper srun arguments
6. Each process should be a single task using 1 core
7. How to create a convenient input for xargs?
8. Please add the:

```
export OMP_NUM_THREADS=1
```

right after the #SBATCH directives, this will instruct imagemagic to use single core per process.

9. The job template is included below

```
#!/bin/bash -l
#SBATCH --nodes=1
#SBATCH --ntasks-per-node=48
#SBATCH --cpus-per-task=1
#SBATCH --account=plgglscclclass24
#SBATCH --partition=plgrid-now
#SBATCH --time=01:00:00
# above config is mandatory!

export OMP_NUM_THREADS=1
# modules initialization
...
# data handling and work
...
# end of the script'
```

SOLUTION

```
#!/bin/bash -l
#SBATCH --nodes=1
#SBATCH --ntasks-per-node=48
#SBATCH --cpus-per-task=1
#SBATCH -A plglscclss24-cpu
#SBATCH --partition=plgrid-now
#SBATCH --time=01:00:00
# above config is mandatory!

export OMP_NUM_THREADS=1
module load imagemagick
cat files | xargs -P 48 -L 1 -n 1 srtn --cpus-per-task=1 bash ./converter.sh
```

```
cat files | xargs -P 48 -L 1 -n 1 srtn --cpus-per-task=1 bash ./converter.sh
[ares][plgqsterius@login01 lab3]$ ls output/
vid_4_1000.jpg vid_4_10800.jpg vid_4_13980.jpg vid_4_17540.jpg vid_4_22300.jpg vid_4_27240.jpg vid_4_5920.jpg
vid_4_10080.jpg vid_4_10860.jpg vid_4_14120.jpg vid_4_17620.jpg vid_4_22360.jpg vid_4_27260.jpg vid_4_6100.jpg
vid_4_10140.jpg vid_4_10980.jpg vid_4_14240.jpg vid_4_17640.jpg vid_4_22640.jpg vid_4_27280.jpg vid_4_6360.jpg
vid_4_10200.jpg vid_4_11160.jpg vid_4_14300.jpg vid_4_18320.jpg vid_4_22740.jpg vid_4_28300.jpg vid_4_6600.jpg
vid_4_1020.jpg vid_4_11340.jpg vid_4_14400.jpg vid_4_18340.jpg vid_4_22800.jpg vid_4_28420.jpg vid_4_6900.jpg
vid_4_10240.jpg vid_4_11420.jpg vid_4_14480.jpg vid_4_18400.jpg vid_4_22860.jpg vid_4_28440.jpg vid_4_6940.jpg
vid_4_10340.jpg vid_4_11960.jpg vid_4_14600.jpg vid_4_18820.jpg vid_4_2300.jpg vid_4_29420.jpg vid_4_7020.jpg
vid_4_10360.jpg vid_4_12020.jpg vid_4_14740.jpg vid_4_18900.jpg vid_4_23220.jpg vid_4_29460.jpg vid_4_720.jpg
vid_4_10380.jpg vid_4_12060.jpg vid_4_14860.jpg vid_4_19020.jpg vid_4_23380.jpg vid_4_29620.jpg vid_4_7260.jpg
vid_4_10400.jpg vid_4_12140.jpg vid_4_14920.jpg vid_4_19620.jpg vid_4_23640.jpg vid_4_29700.jpg vid_4_7300.jpg
vid_4_1040.jpg vid_4_12160.jpg vid_4_14980.jpg vid_4_19700.jpg vid_4_2440.jpg vid_4_3420.jpg vid_4_7400.jpg
vid_4_10420.jpg vid_4_12220.jpg vid_4_15080.jpg vid_4_20140.jpg vid_4_24780.jpg vid_4_3480.jpg vid_4_7440.jpg
vid_4_10440.jpg vid_4_12280.jpg vid_4_1540.jpg vid_4_21000.jpg vid_4_24820.jpg vid_4_3540.jpg vid_4_7660.jpg
vid_4_10480.jpg vid_4_12380.jpg vid_4_16140.jpg vid_4_2100.jpg vid_4_24880.jpg vid_4_3760.jpg vid_4_8340.jpg
vid_4_10500.jpg vid_4_12400.jpg vid_4_16280.jpg vid_4_21040.jpg vid_4_25860.jpg vid_4_3860.jpg vid_4_8640.jpg
vid_4_10520.jpg vid_4_12580.jpg vid_4_16480.jpg vid_4_21200.jpg vid_4_25940.jpg vid_4_4000.jpg vid_4_8980.jpg
vid_4_10540.jpg vid_4_12620.jpg vid_4_16680.jpg vid_4_21420.jpg vid_4_25980.jpg vid_4_4080.jpg vid_4_9000.jpg
vid_4_10560.jpg vid_4_12660.jpg vid_4_16820.jpg vid_4_2160.jpg vid_4_26020.jpg vid_4_4100.jpg vid_4_940.jpg
vid_4_10600.jpg vid_4_13100.jpg vid_4_16960.jpg vid_4_21640.jpg vid_4_26100.jpg vid_4_4140.jpg vid_4_9560.jpg
vid_4_10620.jpg vid_4_13640.jpg vid_4_16980.jpg vid_4_21820.jpg vid_4_26200.jpg vid_4_4400.jpg vid_4_9640.jpg
vid_4_10720.jpg vid_4_13820.jpg vid_4_17100.jpg vid_4_21880.jpg vid_4_26280.jpg vid_4_4420.jpg vid_4_980.jpg
vid_4_10780.jpg vid_4_13900.jpg vid_4_17320.jpg vid_4_22260.jpg vid_4_27120.jpg vid_4_4540.jpg vid_4_9820.jpg
```