

=== HPC utilization as of 2024-11-05 14h15 =====

AION	batch	97.46%
IRIS	batch	93.45%
IRIS	gpu	71.88%
IRIS	bigmem	70.98%

=== Status =====

Gitlab Issue #28 - SIU Network maintenance completed
<https://gitlab.com/uniluxembourg/hpc/support/infra/-/issues/28>

ULHPC live status: <https://hpc.uni.lu/live-status/motd>

=====

Last login: Tue Nov 5 14:03:41 2024 from 83.99.11.129

(base) 0 [scui@access1 ~]\$ cd ml_hpc

(base) 0 [scui@access1 ml_hpc]\$ jupyter console

0.00s - Debugger warning: It seems that frozen modules are being used, which may
0.00s - make the debugger miss breakpoints. Please pass -Xfrozen_modules=off
0.00s - to python to disable frozen modules.
0.00s - Note: Debugging will proceed. Set PYDEVD_DISABLE_FILE_VALIDATION=1 to disable this validation.
0.00s - Debugger warning: It seems that frozen modules are being used, which may
0.00s - make the debugger miss breakpoints. Please pass -Xfrozen_modules=off
0.00s - to python to disable frozen modules.
0.00s - Note: Debugging will proceed. Set PYDEVD_DISABLE_FILE_VALIDATION=1 to disable this validation.
Jupyter console 6.6.3

Python 3.12.2 | packaged by Anaconda, Inc. | (main, Feb 27 2024, 17:35:02) [GCC 11.2.0]

Type 'copyright', 'credits' or 'license' for more information

IPython 8.20.0 -- An enhanced Interactive Python. Type '?' for help.

In [1]: # from KNNClassifier import KNNClassifier

```
...: import numpy as np
...: from joblib import Parallel, delayed
...: import time
```

In [2]: # Example with random data

```
...: rows = 100000
...: cols = 500
...: np.random.seed(699)
...: X_train = np.random.rand(rows * cols).reshape((rows, cols))
...: y_train = np.random.randint(2, size=rows)
...: print(f'X_train shape {X_train.shape} - y_train shape {y_train.shape}')
...:
...: # Create random indices to test
...: test_size = 1000
...: X_test = np.random.randint(rows, size=test_size)
X_train shape (100000, 500) - y_train shape (100000,)
```

Version With Parallel Processing on HPC

```
Run 1: Correct Predictions = 743, Time = 25.2052 seconds
Run 2: Correct Predictions = 743, Time = 24.4197 seconds
Run 3: Correct Predictions = 743, Time = 24.3513 seconds
Run 4: Correct Predictions = 743, Time = 24.3775 seconds
Run 5: Correct Predictions = 743, Time = 24.5291 seconds
Run 6: Correct Predictions = 743, Time = 24.7461 seconds
Run 7: Correct Predictions = 743, Time = 24.6920 seconds
Run 8: Correct Predictions = 743, Time = 24.6381 seconds
Run 9: Correct Predictions = 743, Time = 24.5881 seconds
Run 10: Correct Predictions = 743, Time = 24.5697 seconds
Run 11: Correct Predictions = 743, Time = 24.5257 seconds
Run 12: Correct Predictions = 743, Time = 24.5613 seconds
Run 13: Correct Predictions = 743, Time = 24.6120 seconds
Run 14: Correct Predictions = 743, Time = 24.7778 seconds
Run 15: Correct Predictions = 743, Time = 24.7406 seconds
Run 16: Correct Predictions = 743, Time = 24.6300 seconds
Run 17: Correct Predictions = 743, Time = 24.5915 seconds
Run 18: Correct Predictions = 743, Time = 24.5588 seconds
Run 19: Correct Predictions = 743, Time = 24.2201 seconds
Run 20: Correct Predictions = 743, Time = 24.0001 seconds
Run 21: Correct Predictions = 743, Time = 24.4811 seconds
Run 22: Correct Predictions = 743, Time = 24.4979 seconds
Run 23: Correct Predictions = 743, Time = 23.9794 seconds
Run 24: Correct Predictions = 743, Time = 23.9733 seconds
Run 25: Correct Predictions = 743, Time = 23.8449 seconds
Run 26: Correct Predictions = 743, Time = 24.2664 seconds
Run 27: Correct Predictions = 743, Time = 24.0370 seconds
Run 28: Correct Predictions = 743, Time = 24.1283 seconds
Run 29: Correct Predictions = 743, Time = 24.2254 seconds
Run 30: Correct Predictions = 743, Time = 24.2535 seconds
```

Average Correct Predictions over 30 runs: 743.0

Total Execution Time over 30 runs: 733.0219 seconds

Version Without Parallel Processing on HPC

```
Starting run 30...
Processed batch 1/5
Processed batch 2/5
Processed batch 3/5
Processed batch 4/5
Chunk 1/6 completed in Run 30
Processed batch 1/5
Processed batch 2/5
Processed batch 3/5
Processed batch 4/5
Chunk 2/6 completed in Run 30
Processed batch 1/5
Processed batch 2/5
Processed batch 3/5
Processed batch 4/5
Chunk 3/6 completed in Run 30
Processed batch 1/5
Processed batch 2/5
Processed batch 3/5
Processed batch 4/5
Chunk 4/6 completed in Run 30
Processed batch 1/5
Processed batch 2/5
Processed batch 3/5
Processed batch 4/5
Chunk 5/6 completed in Run 30
Run 30: Correct Predictions = 743, Time = 627.3151 seconds

Average Correct Predictions over 30 runs: 743.0
Total Execution Time over 30 runs: 18687.8560 seconds
```

Below are the **detailed outcomes** for each iteration of KNN predictions (**Without Parallel Processing**).

Starting run 1...	Starting run 2...
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 1/6 completed in Run 1	Chunk 1/6 completed in Run 2
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 2/6 completed in Run 1	Chunk 2/6 completed in Run 2
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 3/6 completed in Run 1	Chunk 3/6 completed in Run 2
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 4/6 completed in Run 1	Chunk 4/6 completed in Run 2
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 5/6 completed in Run 1	Chunk 5/6 completed in Run 2
Run 1: Correct Predictions = 743, Time = 619.9264 seconds	Run 2: Correct Predictions = 743, Time = 621.9362 seconds

Starting run 27...	Starting run 28...
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 1/6 completed in Run 27	Chunk 1/6 completed in Run 28
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 2/6 completed in Run 27	Chunk 2/6 completed in Run 28
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 3/6 completed in Run 27	Chunk 3/6 completed in Run 28
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 4/6 completed in Run 27	Chunk 4/6 completed in Run 28
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 5/6 completed in Run 27	Chunk 5/6 completed in Run 28
Run 27: Correct Predictions = 743, Time = 623.4657 seconds	Run 28: Correct Predictions = 743, Time = 618.6766 seconds

Starting run 29...	Starting run 30...
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 1/6 completed in Run 29	Chunk 1/6 completed in Run 30
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 2/6 completed in Run 29	Chunk 2/6 completed in Run 30
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 3/6 completed in Run 29	Chunk 3/6 completed in Run 30
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 4/6 completed in Run 29	Chunk 4/6 completed in Run 30
Processed batch 1/5	Processed batch 1/5
Processed batch 2/5	Processed batch 2/5
Processed batch 3/5	Processed batch 3/5
Processed batch 4/5	Processed batch 4/5
Chunk 5/6 completed in Run 29	Chunk 5/6 completed in Run 30
Run 29: Correct Predictions = 743, Time = 622.3800 seconds	Run 30: Correct Predictions = 743, Time = 627.3151 seconds
	Average Correct Predictions over 30 runs: 743.0
	Total Execution Time over 30 runs: 18687.8560 seconds