HPC Observations:

(End output of timed and parallelized code block is an array containing values (0-9) corresponding to matched labels at their respective indices using k-means. Output array dim : [512,1])

**Case 1: (1 task = 1 test image vs 1 training image)**

N1 = total tasks = 512 x 512 = 262144

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Num of Batches  (Chunks) | Batch\_size  (N1/num of batches) | Regular  (sec) | | Mem-mapped  (sec)  (test-set mm only) | | Mem-mapped  (sec)  (test+train) | |
| [sum] | [np.sum] | [sum] | [np.sum] | [sum] | [np.sum] |
| 8 | 32768 | 14.892875 | **04.766983** | 14.411720 | 04.887034 | 17.050108 |  |
| 64 | 4096 | 14.680337 | 04.711606 | 14.624040 | 04.731096 |  |  |
| 512 | 512 | 14.503011 | **04.554341** | 14.302047 | 04.726820 | 16.404555 |  |
| 4096 | 64 | 14.969963 | 04.781648 | 14.805438 | 05.014924 | 17.695889 |  |
| 32768 | 8 | 18.212560 | 08.725729 | 20.053059 | 10.092023 | 22.491158 |  |
| 262144 (Round Robin) | 1 | 42.678130 | 37.129153 | 40.778220 | 36.954993 | 44.380234 |  |

(^^ issue behind blank entries to be discussed)

* **\*Time taken to create memmap dump:**
  + **Test set -** 00.038054 sec
  + **Train set -** 00.098017sec
  + **Total - 0.136071 sec**

**Case 2: (1 task = 1 test image vs 512 training images)**

N2 = total tasks = 512

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Num of Batches  (Chunks) | Batch\_size  (N2/num of batches) | Regular  (sec) | | Mem-mapped  (sec)  (test only) | | Mem-mapped  (sec)  (test+train) | |
| [fn with sum] | [fn with np.sum] | [fn with sum] | [fn with np.sum] | [fn with sum] | [fn with np.sum] |
| 8 | 64 | 12.596424 | 01.016314 | 20.911609 #20.xyz | 01.784263 02.009356 | 20.341435 #12.xyz | 01.738998 |
| 64 | 8 | 12.762693 | 01.062842 | 20.986109 | 01.836652 02.082082 | 20.457642 | 01.984205 |
| 512 | 1 | 12.605463 | 01.219038 | 20.072170 | 01.752130 02.127394 | 20.390006 | 02.029299 |
| Non-Parallel | | 38.553829 | 01.574526 | 40.282182 | 01.647202 | 38.812360 | 01.856193 |

**Case 3: (1 task = 512 test images vs 1 training image)**

N3 = total tasks = 512

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Num of Batches  (Chunks) | Batch\_size  (N2/num of batches) | Regular  (sec) | | Mem-mapped  (sec)  (test-set mm only) | | Mem-mapped  (sec)  (test+train) | |
| [fn with sum] | [fn with np.sum] | [fn with sum] | [fn with np.sum] | [fn with sum] | [fn with np.sum] |
| 8 | 64 | 12.010373 | **00.876996** | 12.180157 | **00.926227** | 12.199924 | **01.262302** |
| 64 | 8 | 11.957571 | **00.917441** | 12.294647 | **00.953295** | 12.505527 | **01.250084** |
| 512 | 1 | 12.447629 | **00.948045** | 12.593283 | **00.975411** | 12.554495 | **01.277108** |
| Non-Parallel | | 39.436551 | 01.576580 | 39.602175 | 01.763149 | 39.186669 | 01.780318 |