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C:\Users\ajdse\Anaconda3\python.exe "D:/EEE Year4/Representation-and-
Distance-Metrics-Learning/k_nn_main.py"
[25, 443, 1380, 329, 23, 446, 15, 729, 1292, 299, 813, 1237, 1402, 88,
618, 1427, 986, 759, 809, 1016, 37, 1267, 433, 1323, 811, 1388, 554, 563
, 619, 1214, 385, 13, 567, 966, 1231, 1429, 910, 387, 1382, 1362, 1308,
83, 263, 761, 735, 1, 996, 417, 482, 1191, 906, 1071, 868, 246, 1048, 311
, 1297, 624, 688, 1416, 1281, 900, 995, 94, 1346, 589, 700, 714, 191, 510
, 1364, 334, 209, 39, 1165, 1018, 734, 308, 245, 538, 480, 895, 701, 285
, 1315, 1454, 137, 283, 766, 621, 1377, 686, 992, 1089, 515, 225, 392,
1120, 687, 52]
-----Baseline Simple NN-----
Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 47.0000%
Accuracy for Simple Nearest Neighbour @rank 5 : 66.8571%
Accuracy for Simple Nearest Neighbour @rank 10 : 74.9286%
Computation Time: 244.56530356407166 seconds

-----PCA-----
Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 47.0000%
Accuracy for Simple Nearest Neighbour @rank 5 : 67.1429%
Accuracy for Simple Nearest Neighbour @rank 10 : 74.9286%
Computation Time: 60.01562809944153 seconds

-----LMNN-----
2 1492201.5912604597 -130063.18915840983 71 1.0099999999999999e-06
3 1376092.838951887 -116108.75230857264 33 1.0200999999999998e-06
4 1268252.2866570964 -107840.55229479074 16 1.0303009999999997e-06
5 1168397.491284551 -99854.79537254525 12 1.0406040099999998e-06
6 1076588.9907548057 -91808.50052974536 8 1.0510100500999999e-06
7 993050.8719144454 -83538.11884036032 7 1.061520150601e-06
8 918026.754533605 -75024.11738084047 6 1.07213535210701e-06
9 851786.9652249853 -66239.78930861969 6 1.08285670562808e-06
10 794607.5256242474 -57179.43960073788 4 1.0936852726843608e-06
11 746778.9884292632 -47828.53719498415 4 1.1046221254112045e-06
12 708586.3985757977 -38192.58985346556 4 1.1156683466653166e-06
13 680329.4116148072 -28256.98696099047 4 1.1268250301319698e-06
14 662319.8311683331 -18009.580446474138 6 1.1380932804332895e-06
15 654904.3146950984 -7415.516473234631 14 1.1494742132376223e-06
16 654765.155476759 -139.15921833948232 20 2.9024223884249963e-07
17 654765.155476759 0.0 20 3.3326689530318236e-20
18 654765.155476759 0.0 20 2.1037472766013387e-21
19 654765.155476759 0.0 20 2.124784749367352e-21
LMNN didn't converge in 20 steps.
Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 45.2857%
Accuracy for Simple Nearest Neighbour @rank 5 : 66.0714%
Accuracy for Simple Nearest Neighbour @rank 10 : 73.8571%
Computation Time: 245.03555488586426 seconds

-----PCA_LMNN-----

```

```

2 1366326.7803372412 -129297.92900720262 74 1.0099999999999999e-06
3 1250788.0181446248 -115538.76219261647 35 1.0200999999999998e-06
4 1143517.6086976859 -107270.4094469389 16 1.0303009999999997e-06
5 1044207.5323006443 -99310.07639704156 12 1.0406040099999998e-06
6 952895.5226102856 -91312.00969035877 9 1.0510100500999999e-06
7 869800.3721074313 -83095.15050285426 8 1.061520150601e-06
8 795163.163912978 -74637.20819445327 6 1.07213535210701e-06
9 729255.4172316609 -65907.7466813171 6 1.08285670562808e-06
10 672348.8329520328 -56906.58427962812 6 1.0936852726843608e-06
11 624729.6655412633 -47619.1674107695 4 1.1046221254112045e-06
12 586687.5690575377 -38042.09648372559 4 1.1156683466653166e-06
13 558517.2193290149 -28170.349728522822 5 1.1268250301319698e-06
14 540531.4998157484 -17985.719513266464 8 1.1380932804332895e-06
15 533080.883667701 -7450.616148047382 17 1.1494742132376223e-06
16 532935.4581719857 -145.4254957153462 20 2.9024223884249963e-07
17 532935.4581719857 0.0 20 1.6663344765159118e-20
18 532935.4581719857 0.0 20 4.2074945532026774e-21
19 532935.4581719857 0.0 20 1.062392374683676e-21

```

LMNN didn't converge in 20 steps.

Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 45.2857%
 Accuracy for Simple Nearest Neighbour @rank 5 : 65.8571%
 Accuracy for Simple Nearest Neighbour @rank 10 : 73.7857%
 Computation Time: 56.63761568069458 seconds

-----NCA-----

[NCA]	Iteration	Objective Value	Time(s)
[NCA]	0	7.366959e+03	9.62
[NCA]	1	7.367001e+03	9.60
[NCA]	2	7.367999e+03	9.29
[NCA]	3	7.368000e+03	9.15
[NCA]	4	7.368000e+03	9.03

[NCA] Training took 51.77s.

Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 44.6429%
 Accuracy for Simple Nearest Neighbour @rank 5 : 65.9286%
 Accuracy for Simple Nearest Neighbour @rank 10 : 73.8571%
 Computation Time: 243.62481832504272 seconds

-----PCA_NCA-----

[NCA]	Iteration	Objective Value	Time(s)
[NCA]	0	7.316730e+03	5.66
[NCA]	1	7.367804e+03	5.45
[NCA]	2	7.367995e+03	6.14
[NCA]	3	7.367995e+03	6.14
[NCA]	4	7.367997e+03	5.58
[NCA]	5	7.367998e+03	5.23
[NCA]	6	7.367999e+03	6.14

[NCA]	7	7.367999e+03	6.13
[NCA]	8	7.367999e+03	5.84
[NCA]	9	7.368000e+03	5.28
[NCA]	10	7.368000e+03	6.26
[NCA]	11	7.368000e+03	5.91
[NCA]	12	7.368000e+03	5.81
[NCA]	13	7.368000e+03	5.19
[NCA]	14	7.368000e+03	6.21
[NCA]	15	7.368000e+03	6.07

[NCA] Training took 96.90s.

Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 46.2143%
 Accuracy for Simple Nearest Neighbour @rank 5 : 67.2143%
 Accuracy for Simple Nearest Neighbour @rank 10 : 74.7143%
 Computation Time: 57.11034941673279 seconds

-----ITML-----

itml iter: 0, conv = 18.965872
 itml iter: 1, conv = 2.924228
 itml iter: 2, conv = 0.223983
 itml iter: 3, conv = 0.012775
 itml iter: 4, conv = 0.001302
 itml iter: 5, conv = 0.000106
 itml converged at iter: 6, conv = 0.000006

Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 47.4286%
 Accuracy for Simple Nearest Neighbour @rank 5 : 67.9286%
 Accuracy for Simple Nearest Neighbour @rank 10 : 75.9286%
 Computation Time: 261.13900685310364 seconds

-----PCA_ITML-----

itml iter: 0, conv = 17.742846
 itml iter: 1, conv = 3.392293
 itml iter: 2, conv = 0.387274
 itml iter: 3, conv = 0.036696
 itml iter: 4, conv = 0.006134
 itml iter: 5, conv = 0.000663
 itml iter: 6, conv = 0.000122
 itml iter: 7, conv = 0.000019
 itml converged at iter: 8, conv = 0.000004

Computing KNN ranklist...

Accuracy for Simple Nearest Neighbour @rank 1 : 47.2857%
 Accuracy for Simple Nearest Neighbour @rank 5 : 66.6429%
 Accuracy for Simple Nearest Neighbour @rank 10 : 76.0714%
 Computation Time: 61.34004473686218 seconds

-----MMC-----

Traceback (most recent call last):

File "D:/EEE Year4/Representation-and-Distance-Metrics-Learning/
 k_nn_main.py", line 184, in <module>
 mmc.fit(original_train_features, original_train_labels)

```
File "C:\Users\ajdse\Anaconda3\lib\site-packages\metric_learn\mmc.py",
line 447, in fit
    return MMC.fit(self, X, pos_neg)
File "C:\Users\ajdse\Anaconda3\lib\site-packages\metric_learn\mmc.py",
line 76, in fit
    return self._fit_full(X, constraints)
File "C:\Users\ajdse\Anaconda3\lib\site-packages\metric_learn\mmc.py",
line 145, in _fit_full
    grad2 = self._fD1(X, c, d, A)          # gradient of dissimilarity
constraint function
File "C:\Users\ajdse\Anaconda3\lib\site-packages\metric_learn\mmc.py",
line 311, in _fD1
    M = np.einsum('ij,ik->ijk', diff, diff)
File "C:\Users\ajdse\Anaconda3\lib\site-packages\numpy\core\einsumfunc.
py", line 1069, in einsum
    return c_einsum(*operands, **kwargs)
MemoryError
```

Process finished with exit code 1