Output tables for the test of Multiple comparisons.

June 23, 2019

1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
DSC-R	1.95
DSC-S	3.6167
KMeanClustering	5.6417
LearnppCDS	3.3
LearnppNIE	3.6417
REA	4.05
OUSE	6.0667
MLPClassifier	7.7333

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 7 degrees of freedom: 238.743056.

P-value computed by Friedman Test: 1.0799450222975793E-10.

2 Post hoc comparisons

Results achieved on post hoc comparisons for $\alpha = 0.05$, $\alpha = 0.10$ and adjusted p-values.

2.1 P-values for $\alpha = 0.05$

i	algorithms	$z = (R_0 - R_i)/SE$	p
28	DSC-R vs. MLPClassifier	12.931926	0
27	LearnppCDS vs. MLPClassifier	9.913235	0
26	DSC-S vs. MLPClassifier	9.205147	0
25	DSC-R vs. OUSE	9.205147	0
24	LearnppNIE vs. MLPClassifier	9.149245	0
23	DSC-R vs. KMeanClustering	8.254818	0
22	REA vs. MLPClassifier	8.236184	0
21	LearnppCDS vs. OUSE	6.186455	0
20	DSC-S vs. OUSE	5.478367	0
19	LearnppNIE vs. OUSE	5.422465	0
18	KMeanClustering vs. LearnppCDS	5.236126	0
17	DSC-R vs. REA	4.695743	0.000003
16	KMeanClustering vs. MLPClassifier	4.677109	0.000003
15	DSC-S vs. KMeanClustering	4.528038	0.000006
14	REA vs. OUSE	4.509404	0.000007
13	KMeanClustering vs. LearnppNIE	4.472136	0.000008
12	DSC-R vs. LearnppNIE	3.782682	0.000155
11	OUSE vs. MLPClassifier	3.72678	0.000194
10	DSC-R vs. DSC-S	3.72678	0.000194
9	KMeanClustering vs. REA	3.559075	0.000372
8	DSC-R vs. LearnppCDS	3.018692	0.002539
7	LearnppCDS vs. REA	1.677051	0.093533
6	DSC-S vs. REA	0.968963	0.332564
5	KMeanClustering vs. OUSE	0.950329	0.341945
4	LearnppNIE vs. REA	0.913061	0.36121
3	LearnppCDS vs. LearnppNIE	0.76399	0.444873
2	DSC-S vs. LearnppCDS	0.708088	0.47889
1	DSC-S vs. LearnppNIE	0.055902	0.95542

Table 2: P-values Table for $\alpha = 0.05$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.001786.

2.2 P-values for $\alpha = 0.10$

i	algorithms	$z = (R_0 - R_i)/SE$	p
28	DSC-R vs. MLPClassifier	12.931926	0
27	LearnppCDS vs. MLPClassifier	9.913235	0
26	DSC-S vs. MLPClassifier	9.205147	0
25	DSC-R vs. OUSE	9.205147	0
24	LearnppNIE vs. MLPClassifier	9.149245	0
23	DSC-R vs. KMeanClustering	8.254818	0
22	REA vs. MLPClassifier	8.236184	0
21	LearnppCDS vs. OUSE	6.186455	0
20	DSC-S vs. OUSE	5.478367	0
19	LearnppNIE vs. OUSE	5.422465	0
18	KMeanClustering vs. LearnppCDS	5.236126	0
17	DSC-R vs. REA	4.695743	0.000003
16	KMeanClustering vs. MLPClassifier	4.677109	0.000003
15	DSC-S vs. KMeanClustering	4.528038	0.000006
14	REA vs. OUSE	4.509404	0.000007
13	KMeanClustering vs. LearnppNIE	4.472136	0.000008
12	DSC-R vs. LearnppNIE	3.782682	0.000155
11	OUSE vs. MLPClassifier	3.72678	0.000194
10	DSC-R vs. DSC-S	3.72678	0.000194
9	KMeanClustering vs. REA	3.559075	0.000372
8	DSC-R vs. LearnppCDS	3.018692	0.002539
7	LearnppCDS vs. REA	1.677051	0.093533
6	DSC-S vs. REA	0.968963	0.332564
5	KMeanClustering vs. OUSE	0.950329	0.341945
4	LearnppNIE vs. REA	0.913061	0.36121
3	LearnppCDS vs. LearnppNIE	0.76399	0.444873
2	DSC-S vs. LearnppCDS	0.708088	0.47889
1	DSC-S vs. LearnppNIE	0.055902	0.95542

Table 3: P-values Table for $\alpha = 0.10$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.003571.

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}
1	DSC-R vs .MLPClassifier	0	0
2	LearnppCDS vs .MLPClassifier	0	0
3	DSC-S vs .MLPClassifier	0	0
4	DSC-R vs .OUSE	0	0
5	LearnppNIE vs .MLPClassifier	0	0
6	DSC-R vs .KMeanClustering	0	0
7	REA vs .MLPClassifier	0	0
8	LearnppCDS vs .OUSE	0	0
9	DSC-S vs .OUSE	0	0.000001
10	LearnppNIE vs .OUSE	0	0.000002
11	KMeanClustering vs .LearnppCDS	0	0.000005
12	DSC-R vs .REA	0.000003	0.000074
13	KMeanClustering vs .MLPClassifier	0.000003	0.000081
14	DSC-S vs .KMeanClustering	0.000006	0.000167
15	REA vs .OUSE	0.000007	0.000182
16	KMeanClustering vs .LearnppNIE	0.000008	0.000217
17	DSC-R vs .LearnppNIE	0.000155	0.004344
18	OUSE vs .MLPClassifier	0.000194	0.00543
19	DSC-R vs .DSC-S	0.000194	0.00543
20	KMeanClustering vs .REA	0.000372	0.010421
21	DSC-R vs .LearnppCDS	0.002539	0.071083
22	LearnppCDS vs .REA	0.093533	2.61891
23	DSC-S vs .REA	0.332564	9.311785
24	KMeanClustering vs .OUSE	0.341945	9.574465
25	LearnppNIE vs .REA	0.36121	10.113892
26	LearnppCDS vs .LearnppNIE	0.444873	12.456451
27	DSC-S vs .LearnppCDS	0.47889	13.408934
28	DSC-S vs .LearnppNIE	0.95542	26.751763

Table 4: Adjusted p-values