Output tables for the test of Multiple comparisons.

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1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
Base	7.8906
ADASYN	2.4531
SMOTE	4.0938
Bord	3.7344
NCL	6.7031
SMOTE+TL	4.2344
SMOTE+ENN	4.8594
CCR	2.0312

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 7 degrees of freedom: 147.122396.

P-value computed by Friedman Test: 6.60115295758601E-11.

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	Shaffer
28	Base vs. CCR	9.568319	0	0.001786
27	Base vs. ADASYN	8.8794	0	0.002381
26	NCL vs. CCR	7.62914	0	0.002381
25	ADASYN vs. NCL	6.940221	0	0.002381
24	Base vs. Bord	6.787128	0	0.002381
23	Base vs. SMOTE	6.200271	0	0.002381
22	Base vs. SMOTE+TL	5.970631	0	0.002381
21	Base vs. SMOTE+ENN	4.950011	0.000001	0.002381
20	Bord vs. NCL	4.847948	0.000001	0.003125
19	SMOTE+ENN vs. CCR	4.618309	0.000004	0.003125
18	SMOTE vs. NCL	4.261092	0.00002	0.003125
17	NCL vs. SMOTE+TL	4.031452	0.000055	0.003125
16	ADASYN vs. SMOTE+ENN	3.92939	0.000085	0.003125
15	SMOTE+TL vs. CCR	3.597688	0.000321	0.003333
14	SMOTE vs. CCR	3.368048	0.000757	0.003846
13	NCL vs. SMOTE+ENN	3.010831	0.002605	0.003846
12	ADASYN vs. SMOTE+TL	2.908769	0.003629	0.004167
11	Bord vs. CCR	2.781191	0.005416	0.004545
10	ADASYN vs. SMOTE	2.679129	0.007381	0.005
9	ADASYN vs. Bord	2.092272	0.036414	0.005556
8	Base vs. NCL	1.939179	0.052479	0.00625
7	Bord vs. SMOTE+ENN	1.837117	0.066193	0.007143
6	SMOTE vs. SMOTE+ENN	1.25026	0.211204	0.008333
5	SMOTE+TL vs. SMOTE+ENN	1.020621	0.307434	0.01
4	Bord vs. SMOTE+TL	0.816497	0.414216	0.0125
3	ADASYN vs. CCR	0.688919	0.490874	0.016667
2	SMOTE vs. Bord	0.586857	0.5573	0.025
1	SMOTE vs. SMOTE+TL	0.22964	0.818372	0.05

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

Shaffer'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	Shaffer
28	Base vs. CCR	9.568319	0	0.003571
27	Base vs. ADASYN	8.8794	0	0.004762
26	NCL vs. CCR	7.62914	0	0.004762
25	ADASYN vs. NCL	6.940221	0	0.004762
24	Base vs. Bord	6.787128	0	0.004762
23	Base vs. SMOTE	6.200271	0	0.004762
22	Base vs. SMOTE+TL	5.970631	0	0.004762
21	Base vs. SMOTE+ENN	4.950011	0.000001	0.004762
20	Bord vs. NCL	4.847948	0.000001	0.00625
19	SMOTE+ENN vs. CCR	4.618309	0.000004	0.00625
18	SMOTE vs. NCL	4.261092	0.00002	0.00625
17	NCL vs. SMOTE+TL	4.031452	0.000055	0.00625
16	ADASYN vs. SMOTE+ENN	3.92939	0.000085	0.00625
15	SMOTE+TL vs. CCR	3.597688	0.000321	0.006667
14	SMOTE vs. CCR	3.368048	0.000757	0.007692
13	NCL vs. SMOTE+ENN	3.010831	0.002605	0.007692
12	ADASYN vs. SMOTE+TL	2.908769	0.003629	0.008333
11	Bord vs. CCR	2.781191	0.005416	0.009091
10	ADASYN vs. SMOTE	2.679129	0.007381	0.01
9	ADASYN vs. Bord	2.092272	0.036414	0.011111
8	Base vs. NCL	1.939179	0.052479	0.0125
7	Bord vs. SMOTE+ENN	1.837117	0.066193	0.014286
6	SMOTE vs. SMOTE+ENN	1.25026	0.211204	0.016667
5	SMOTE+TL vs. SMOTE+ENN	1.020621	0.307434	0.02
4	Bord vs. SMOTE+TL	0.816497	0.414216	0.025
3	ADASYN vs. CCR	0.688919	0.490874	0.033333
2	SMOTE vs. Bord	0.586857	0.5573	0.05
1	SMOTE vs. SMOTE+TL	0.22964	0.818372	0.1

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

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

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Shaf}
1	Base vs .CCR	0	0
2	Base vs .ADASYN	0	0
3	NCL vs .CCR	0	0
4	ADASYN vs .NCL	0	0
5	Base vs .Bord	0	0
6	Base vs .SMOTE	0	0
7	Base vs .SMOTE+TL	0	0
8	Base vs .SMOTE+ENN	0.000001	0.000016
9	Bord vs .NCL	0.000001	0.00002
10	SMOTE+ENN vs .CCR	0.000004	0.000062
11	SMOTE vs .NCL	0.00002	0.000325
12	NCL vs .SMOTE+TL	0.000055	0.000887
13	ADASYN vs .SMOTE+ENN	0.000085	0.001363
14	SMOTE+TL vs .CCR	0.000321	0.004816
15	SMOTE vs .CCR	0.000757	0.009841
16	NCL vs .SMOTE+ENN	0.002605	0.033869
17	ADASYN vs .SMOTE+TL	0.003629	0.043543
18	Bord vs .CCR	0.005416	0.059576
19	ADASYN vs .SMOTE	0.007381	0.073814
20	ADASYN vs .Bord	0.036414	0.327727
21	Base vs .NCL	0.052479	0.419836
22	Bord vs .SMOTE+ENN	0.066193	0.463348
23	SMOTE vs .SMOTE+ENN	0.211204	1.267227
24	SMOTE+TL vs .SMOTE+ENN	0.307434	1.537171
25	Bord vs .SMOTE+TL	0.414216	1.656865
26	ADASYN vs .CCR	0.490874	1.656865
27	SMOTE vs .Bord	0.5573	1.656865
28	SMOTE vs .SMOTE+TL	0.818372	1.656865

Table 4: Adjusted p-values