Output tables for the test of Multiple comparisons.

June 12, 2017

1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
Base	5.4062
ADASYN	3.9688
SMOTE	4.2031
Bord	4.4062
NCL	4.25
SMOTE+TL	3.875
SMOTE+ENN	4.6406
CCR	5.25

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 7 degrees of freedom: 11.924479.

P-value computed by Friedman Test: 0.10306992473773102.

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. SMOTE+TL	2.500521	0.012401	0.001786
27	Base vs. ADASYN	2.347428	0.018904	0.001852
26	SMOTE+TL vs. CCR	2.245366	0.024745	0.001923
25	ADASYN vs. CCR	2.092272	0.036414	0.002
24	Base vs. SMOTE	1.964695	0.04945	0.002083
23	Base vs. NCL	1.888148	0.059006	0.002174
22	SMOTE vs. CCR	1.70954	0.087351	0.002273
21	Base vs. Bord	1.632993	0.10247	0.002381
20	NCL vs. CCR	1.632993	0.10247	0.0025
19	Bord vs. CCR	1.377838	0.168253	0.002632
18	Base vs. SMOTE+ENN	1.25026	0.211204	0.002778
17	SMOTE+TL vs. SMOTE+ENN	1.25026	0.211204	0.002941
16	ADASYN vs. SMOTE+ENN	1.097167	0.272568	0.003125
15	SMOTE+ENN vs. CCR	0.995105	0.319685	0.003333
14	Bord vs. SMOTE+TL	0.867528	0.385653	0.003571
13	ADASYN vs. Bord	0.714435	0.474959	0.003846
12	SMOTE vs. SMOTE+ENN	0.714435	0.474959	0.004167
11	NCL vs. SMOTE+ENN	0.637888	0.523547	0.004545
10	NCL vs. SMOTE+TL	0.612372	0.540291	0.005
9	SMOTE vs. SMOTE+TL	0.535826	0.592079	0.005556
8	ADASYN vs. NCL	0.459279	0.646034	0.00625
7	ADASYN vs. SMOTE	0.382733	0.701918	0.007143
6	Bord vs. SMOTE+ENN	0.382733	0.701918	0.008333
5	SMOTE vs. Bord	0.331702	0.740114	0.01
4	Base vs. CCR	0.255155	0.798603	0.0125
3	Bord vs. NCL	0.255155	0.798603	0.016667
2	ADASYN vs. SMOTE+TL	0.153093	0.878325	0.025
1	SMOTE vs. NCL	0.076547	0.938984	0.05

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

2.2 P-values for $\alpha = 0.10$

i	algorithms	$z = (R_0 - R_i)/SE$	p	Shaffer
28	Base vs. SMOTE+TL	2.500521	0.012401	0.003571
27	Base vs. ADASYN	2.347428	0.018904	0.003704
26	SMOTE+TL vs. CCR	2.245366	0.024745	0.003846
25	ADASYN vs. CCR	2.092272	0.036414	0.004
24	Base vs. SMOTE	1.964695	0.04945	0.004167
23	Base vs. NCL	1.888148	0.059006	0.004348
22	SMOTE vs. CCR	1.70954	0.087351	0.004545
21	Base vs. Bord	1.632993	0.10247	0.004762
20	NCL vs. CCR	1.632993	0.10247	0.005
19	Bord vs. CCR	1.377838	0.168253	0.005263
18	Base vs. SMOTE+ENN	1.25026	0.211204	0.005556
17	SMOTE+TL vs. SMOTE+ENN	1.25026	0.211204	0.005882
16	ADASYN vs. SMOTE+ENN	1.097167	0.272568	0.00625
15	SMOTE+ENN vs. CCR	0.995105	0.319685	0.006667
14	Bord vs. SMOTE+TL	0.867528	0.385653	0.007143
13	ADASYN vs. Bord	0.714435	0.474959	0.007692
12	SMOTE vs. SMOTE+ENN	0.714435	0.474959	0.008333
11	NCL vs. SMOTE+ENN	0.637888	0.523547	0.009091
10	NCL vs. SMOTE+TL	0.612372	0.540291	0.01
9	SMOTE vs. SMOTE+TL	0.535826	0.592079	0.011111
8	ADASYN vs. NCL	0.459279	0.646034	0.0125
7	ADASYN vs. SMOTE	0.382733	0.701918	0.014286
6	Bord vs. SMOTE+ENN	0.382733	0.701918	0.016667
5	SMOTE vs. Bord	0.331702	0.740114	0.02
4	Base vs. CCR	0.255155	0.798603	0.025
3	Bord vs. NCL	0.255155	0.798603	0.033333
2	ADASYN vs. SMOTE+TL	0.153093	0.878325	0.05
1	SMOTE vs. NCL	0.076547	0.938984	0.1

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

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Shaf}
1	Base vs .SMOTE+TL	0.012401	0.34723
2	Base vs .ADASYN	0.018904	0.396974
3	SMOTE+TL vs .CCR	0.024745	0.519638
4	ADASYN vs .CCR	0.036414	0.764697
5	Base vs .SMOTE	0.04945	1.038441
6	Base vs .NCL	0.059006	1.239127
7	SMOTE vs .CCR	0.087351	1.834371
8	Base vs .Bord	0.10247	2.151879
9	NCL vs .CCR	0.10247	2.151879
10	Bord vs .CCR	0.168253	2.692053
11	Base vs .SMOTE+ENN	0.211204	3.379271
12	SMOTE+TL vs .SMOTE+ENN	0.211204	3.379271
13	ADASYN vs .SMOTE+ENN	0.272568	4.361092
14	SMOTE+ENN vs .CCR	0.319685	4.795276
15	Bord vs .SMOTE+TL	0.385653	5.013489
16	ADASYN vs .Bord	0.474959	6.174461
17	SMOTE vs .SMOTE+ENN	0.474959	6.174461
18	NCL vs .SMOTE+ENN	0.523547	6.174461
19	NCL vs .SMOTE+TL	0.540291	6.174461
20	SMOTE vs .SMOTE+TL	0.592079	6.174461
21	ADASYN vs .NCL	0.646034	6.174461
22	ADASYN vs .SMOTE	0.701918	6.174461
23	Bord vs .SMOTE+ENN	0.701918	6.174461
24	SMOTE vs .Bord	0.740114	6.174461
25	Base vs .CCR	0.798603	6.174461
26	Bord vs .NCL	0.798603	6.174461
27	ADASYN vs .SMOTE+TL	0.878325	6.174461
28	SMOTE vs .NCL	0.938984	6.174461

Table 4: Adjusted p-values