Output tables for the test of Multiple comparisons.

September 25, 2018

1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
Conf 1	3.24
Conf 2	5.16
Conf 3	3.4
Conf 4	5.12
Conf 5	3.52
Conf 6	4.24
Conf 7	3.32

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 6 degrees of freedom: 22.971429.
P-value computed by Friedman Test: 8.061046248311055E-4.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 6 and 144 degrees of freedom: 4.340081.

P-value computed by Iman and Daveport Test: 4.6726505051826066E-4.

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	Holm	Shaffer
21	Conf 1 vs. Conf 2	3.142338	0.001676	0.002381	0.002381
20	Conf 1 vs. Conf 4	3.076872	0.002092	0.0025	0.003333
19	Conf 2 vs. Conf 7	3.011407	0.0026	0.002632	0.003333
18	Conf 4 vs. Conf 7	2.945942	0.00322	0.002778	0.003333
17	Conf 2 vs. Conf 3	2.880476	0.003971	0.002941	0.003333
16	Conf 3 vs. Conf 4	2.815011	0.004878	0.003125	0.003333
15	Conf 2 vs. Conf 5	2.68408	0.007273	0.003333	0.003333
14	Conf 4 vs. Conf 5	2.618615	0.008829	0.003571	0.003571
13	Conf 1 vs. Conf 6	1.636634	0.101707	0.003846	0.003846
12	Conf 2 vs. Conf 6	1.505703	0.132143	0.004167	0.004167
11	Conf 6 vs. Conf 7	1.505703	0.132143	0.004545	0.004545
10	Conf 4 vs. Conf 6	1.440238	0.1498	0.005	0.005
9	Conf 3 vs. Conf 6	1.374773	0.169202	0.005556	0.005556
8	Conf 5 vs. Conf 6	1.178377	0.238646	0.00625	0.00625
7	Conf 1 vs. Conf 5	0.458258	0.646767	0.007143	0.007143
6	Conf 5 vs. Conf 7	0.327327	0.743421	0.008333	0.008333
5	Conf 1 vs. Conf 3	0.261861	0.793428	0.01	0.01
4	Conf 3 vs. Conf 5	0.196396	0.8443	0.0125	0.0125
3	Conf 1 vs. Conf 7	0.130931	0.89583	0.016667	0.016667
2	Conf 3 vs. Conf 7	0.130931	0.89583	0.025	0.025
1	Conf 2 vs. Conf 4	0.065465	0.947803	0.05	0.05

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

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002381.
Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002778.
Shaffer's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002381.
Bergmann's procedure rejects these hypotheses:

- Conf 1 vs. Conf 2
- Conf 1 vs. Conf 4
- Conf 2 vs. Conf 3
- Conf 2 vs. Conf 7
- Conf 3 vs. Conf 4
- Conf 4 vs. Conf 7

2.2 P-values for $\alpha = 0.10$

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm	Shaffer
21	Conf 1 vs. Conf 2	3.142338	0.001676	0.004762	0.004762
20	Conf 1 vs. Conf 4	3.076872	0.002092	0.005	0.006667
19	Conf 2 vs. Conf 7	3.011407	0.0026	0.005263	0.006667
18	Conf 4 vs. Conf 7	2.945942	0.00322	0.005556	0.006667
17	Conf 2 vs. Conf 3	2.880476	0.003971	0.005882	0.006667
16	Conf 3 vs. Conf 4	2.815011	0.004878	0.00625	0.006667
15	Conf 2 vs. Conf 5	2.68408	0.007273	0.006667	0.006667
14	Conf 4 vs. Conf 5	2.618615	0.008829	0.007143	0.007143
13	Conf 1 vs. Conf 6	1.636634	0.101707	0.007692	0.007692
12	Conf 2 vs. Conf 6	1.505703	0.132143	0.008333	0.008333
11	Conf 6 vs. Conf 7	1.505703	0.132143	0.009091	0.009091
10	Conf 4 vs. Conf 6	1.440238	0.1498	0.01	0.01
9	Conf 3 vs. Conf 6	1.374773	0.169202	0.011111	0.011111
8	Conf 5 vs. Conf 6	1.178377	0.238646	0.0125	0.0125
7	Conf 1 vs. Conf 5	0.458258	0.646767	0.014286	0.014286
6	Conf 5 vs. Conf 7	0.327327	0.743421	0.016667	0.016667
5	Conf 1 vs. Conf 3	0.261861	0.793428	0.02	0.02
4	Conf 3 vs. Conf 5	0.196396	0.8443	0.025	0.025
3	Conf 1 vs. Conf 7	0.130931	0.89583	0.033333	0.033333
2	Conf 3 vs. Conf 7	0.130931	0.89583	0.05	0.05
1	Conf 2 vs. Conf 4	0.065465	0.947803	0.1	0.1

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

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.004762.
Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.006667.
Shaffer's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.004762.
Bergmann's procedure rejects these hypotheses:

- Conf 1 vs. Conf 2
- Conf 1 vs. Conf 4
- Conf 2 vs. Conf 3

- Conf 2 vs. Conf 5
- Conf 2 vs. Conf 7
- Conf 3 vs. Conf 4
- Conf 4 vs. Conf 5
- Conf 4 vs. Conf 7

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}	p_{Holm}	p_{Shaf}	p_{Berg}
1	Conf 1 vs .Conf 2	0.001676	0.035197	0.035197	0.035197	0.035197
2	Conf 1 vs .Conf 4	0.002092	0.043929	0.041837	0.035197	0.035197
3	Conf 2 vs .Conf 7	0.0026	0.054608	0.049408	0.039006	0.039006
4	Conf 4 vs .Conf 7	0.00322	0.067614	0.057955	0.048296	0.039006
5	Conf 2 vs .Conf 3	0.003971	0.083386	0.067503	0.059561	0.043678
6	Conf 3 vs .Conf 4	0.004878	0.102429	0.078041	0.073163	0.043678
7	Conf 2 vs .Conf 5	0.007273	0.152732	0.109095	0.109095	0.065457
8	Conf 4 vs .Conf 5	0.008829	0.185404	0.123603	0.109095	0.065457
9	Conf 1 vs .Conf 6	0.101707	2.135846	1.32219	1.118776	1.118776
10	Conf 2 vs .Conf 6	0.132143	2.77501	1.58572	1.453577	1.18929
11	Conf 6 vs .Conf 7	0.132143	2.77501	1.58572	1.453577	1.18929
12	Conf 4 vs .Conf 6	0.1498	3.145801	1.58572	1.498001	1.18929
13	Conf 3 vs .Conf 6	0.169202	3.55324	1.58572	1.522817	1.18929
14	Conf 5 vs .Conf 6	0.238646	5.011576	1.909172	1.670525	1.193232
15	Conf 1 vs .Conf 5	0.646767	13.582115	4.527372	4.527372	4.527372
16	Conf 5 vs .Conf 7	0.743421	15.611835	4.527372	4.527372	4.527372
17	Conf 1 vs .Conf 3	0.793428	16.661993	4.527372	4.527372	4.527372
18	Conf 3 vs .Conf 5	0.8443	17.730303	4.527372	4.527372	4.527372
19	Conf 1 vs .Conf 7	0.89583	18.812432	4.527372	4.527372	4.527372
20	Conf 3 vs .Conf 7	0.89583	18.812432	4.527372	4.527372	4.527372
21	Conf 2 vs .Conf 4	0.947803	19.903873	4.527372	4.527372	4.527372

Table 4: Adjusted p-values