

Output tables for the test of Multiple comparisons.

September 24, 2018

1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
Conf 1	3.48
Conf 2	4.2
Conf 3	4.12
Conf 4	5.12
Conf 5	3.2
Conf 6	4.16
Conf 7	3.72

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 6 degrees of freedom: 12.445714.
P-value computed by Friedman Test: 0.0527328704276514.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 6 and 144 degrees of freedom: 2.171486.

P-value computed by Iman and Davenport Test: 0.049050961138958384.

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 4 vs. Conf 5	3.142338	0.001676	0.002381	0.002381
20	Conf 1 vs. Conf 4	2.68408	0.007273	0.0025	0.003333
19	Conf 4 vs. Conf 7	2.291288	0.021947	0.002632	0.003333
18	Conf 2 vs. Conf 5	1.636634	0.101707	0.002778	0.003333
17	Conf 3 vs. Conf 4	1.636634	0.101707	0.002941	0.003333
16	Conf 4 vs. Conf 6	1.571169	0.116143	0.003125	0.003333
15	Conf 5 vs. Conf 6	1.571169	0.116143	0.003333	0.003333
14	Conf 2 vs. Conf 4	1.505703	0.132143	0.003571	0.003571
13	Conf 3 vs. Conf 5	1.505703	0.132143	0.003846	0.003846
12	Conf 1 vs. Conf 2	1.178377	0.238646	0.004167	0.004167
11	Conf 1 vs. Conf 6	1.112911	0.265747	0.004545	0.004545
10	Conf 1 vs. Conf 3	1.047446	0.294894	0.005	0.005
9	Conf 5 vs. Conf 7	0.85105	0.394742	0.005556	0.005556
8	Conf 2 vs. Conf 7	0.785584	0.432111	0.00625	0.00625
7	Conf 6 vs. Conf 7	0.720119	0.471452	0.007143	0.007143
6	Conf 3 vs. Conf 7	0.654654	0.512691	0.008333	0.008333
5	Conf 1 vs. Conf 5	0.458258	0.646767	0.01	0.01
4	Conf 1 vs. Conf 7	0.392792	0.694473	0.0125	0.0125
3	Conf 2 vs. Conf 3	0.130931	0.89583	0.016667	0.016667
2	Conf 2 vs. Conf 6	0.065465	0.947803	0.025	0.025
1	Conf 3 vs. Conf 6	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 ≤ 0.0025 .

Shaffer's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002381 .

Bergmann's procedure rejects these hypotheses:

- Conf 4 vs. Conf 5

2.2 P-values for $\alpha = 0.10$

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm	Shaffer
21	Conf 4 vs. Conf 5	3.142338	0.001676	0.004762	0.004762
20	Conf 1 vs. Conf 4	2.68408	0.007273	0.005	0.006667
19	Conf 4 vs. Conf 7	2.291288	0.021947	0.005263	0.006667
18	Conf 2 vs. Conf 5	1.636634	0.101707	0.005556	0.006667
17	Conf 3 vs. Conf 4	1.636634	0.101707	0.005882	0.006667
16	Conf 4 vs. Conf 6	1.571169	0.116143	0.00625	0.006667
15	Conf 5 vs. Conf 6	1.571169	0.116143	0.006667	0.006667
14	Conf 2 vs. Conf 4	1.505703	0.132143	0.007143	0.007143
13	Conf 3 vs. Conf 5	1.505703	0.132143	0.007692	0.007692
12	Conf 1 vs. Conf 2	1.178377	0.238646	0.008333	0.008333
11	Conf 1 vs. Conf 6	1.112911	0.265747	0.009091	0.009091
10	Conf 1 vs. Conf 3	1.047446	0.294894	0.01	0.01
9	Conf 5 vs. Conf 7	0.85105	0.394742	0.011111	0.011111
8	Conf 2 vs. Conf 7	0.785584	0.432111	0.0125	0.0125
7	Conf 6 vs. Conf 7	0.720119	0.471452	0.014286	0.014286
6	Conf 3 vs. Conf 7	0.654654	0.512691	0.016667	0.016667
5	Conf 1 vs. Conf 5	0.458258	0.646767	0.02	0.02
4	Conf 1 vs. Conf 7	0.392792	0.694473	0.025	0.025
3	Conf 2 vs. Conf 3	0.130931	0.89583	0.033333	0.033333
2	Conf 2 vs. Conf 6	0.065465	0.947803	0.05	0.05
1	Conf 3 vs. Conf 6	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 ≤ 0.005 .

Shaffer's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.004762 .

Bergmann's procedure rejects these hypotheses:

- Conf 4 vs. Conf 5

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}	$p_{H olm}$	p_{Shaf}	p_{Berg}
1	Conf 4 vs .Conf 5	0.001676	0.035197	0.035197	0.035197	0.035197
2	Conf 1 vs .Conf 4	0.007273	0.152732	0.145459	0.109095	0.109095
3	Conf 4 vs .Conf 7	0.021947	0.460882	0.416989	0.329202	0.241414
4	Conf 2 vs .Conf 5	0.101707	2.135846	1.830725	1.525604	1.525604
5	Conf 3 vs .Conf 4	0.101707	2.135846	1.830725	1.525604	1.525604
6	Conf 4 vs .Conf 6	0.116143	2.439012	1.858295	1.742152	1.525604
7	Conf 5 vs .Conf 6	0.116143	2.439012	1.858295	1.742152	1.525604
8	Conf 2 vs .Conf 4	0.132143	2.77501	1.858295	1.742152	1.525604
9	Conf 3 vs .Conf 5	0.132143	2.77501	1.858295	1.742152	1.525604
10	Conf 1 vs .Conf 2	0.238646	5.011576	2.863758	2.625111	2.386465
11	Conf 1 vs .Conf 6	0.265747	5.580678	2.923212	2.923212	2.386465
12	Conf 1 vs .Conf 3	0.294894	6.192774	2.94894	2.94894	2.386465
13	Conf 5 vs .Conf 7	0.394742	8.289576	3.552675	3.552675	2.386465
14	Conf 2 vs .Conf 7	0.432111	9.074331	3.552675	3.552675	3.024777
15	Conf 6 vs .Conf 7	0.471452	9.900486	3.552675	3.552675	3.024777
16	Conf 3 vs .Conf 7	0.512691	10.766506	3.552675	3.552675	3.024777
17	Conf 1 vs .Conf 5	0.646767	13.582115	3.552675	3.552675	3.024777
18	Conf 1 vs .Conf 7	0.694473	14.583932	3.552675	3.552675	3.024777
19	Conf 2 vs .Conf 3	0.89583	18.812432	3.552675	3.552675	3.024777
20	Conf 2 vs .Conf 6	0.947803	19.903873	3.552675	3.552675	3.024777
21	Conf 3 vs .Conf 6	0.947803	19.903873	3.552675	3.552675	3.024777

Table 4: Adjusted p -values