

Output tables for the test of Multiple comparisons.

December 26, 2016

1 **Average rankings of Friedman test**

Average ranks obtained by applying the Friedman procedure

Algorithm	Ranking
SVRCC	3.0417
MORF	6.5833
ST	5.6667
MTS	6.0833
MTSC	6.25
RC	7.8333
ERC	6.125
ERCC	5.125
SVR	4.6667
SVRRC	3.625

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 9 degrees of freedom: 48.
P-value computed by Friedman Test: 2.5545038140339926E-7.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 9 and 207 degrees of freedom: 6.571429.
P-value computed by Iman and Daveport Test: 3.080833378939886E-8.

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 $\alpha = 0.05$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.001111 .

Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.001351 .

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm
45	SVRCC vs. RC	5.48241	0	0.001111
44	RC vs. SVRRC	4.814986	0.000001	0.001136
43	SVRCC vs. MORF	4.052216	0.000051	0.001163
42	SVRCC vs. MTSC	3.670831	0.000242	0.00119
41	RC vs. SVR	3.623158	0.000291	0.00122
40	SVRCC vs. ERC	3.527812	0.000419	0.00125
39	SVRCC vs. MTS	3.480138	0.000501	0.001282
38	MORF vs. SVRRC	3.384792	0.000712	0.001316
37	RC vs. ERCC	3.098753	0.001943	0.001351
36	SVRCC vs. ST	3.003407	0.00267	0.001389
35	MTSC vs. SVRRC	3.003407	0.00267	0.001429
34	ERC vs. SVRRC	2.860388	0.004231	0.001471
33	MTS vs. SVRRC	2.812715	0.004913	0.001515
32	ST vs. RC	2.479003	0.013175	0.001563
31	SVRCC vs. ERCC	2.383656	0.017142	0.001613
30	ST vs. SVRRC	2.335983	0.019492	0.001667
29	MORF vs. SVR	2.192964	0.02831	0.001724
28	MTS vs. RC	2.002271	0.045256	0.001786
27	RC vs. ERC	1.954598	0.050631	0.001852
26	SVRCC vs. SVR	1.859252	0.062991	0.001923
25	MTSC vs. RC	1.811579	0.070051	0.002
24	MTSC vs. SVR	1.811579	0.070051	0.002083
23	ERCC vs. SVRRC	1.716233	0.086119	0.002174
22	ERC vs. SVR	1.66856	0.095205	0.002273
21	MORF vs. ERCC	1.66856	0.095205	0.002381
20	MTS vs. SVR	1.620886	0.105042	0.0025
19	MORF vs. RC	1.430194	0.152661	0.002632
18	MTSC vs. ERCC	1.287174	0.198033	0.002778
17	SVR vs. SVRRC	1.191828	0.233329	0.002941
16	ERC vs. ERCC	1.144155	0.252559	0.003125
15	ST vs. SVR	1.144155	0.252559	0.003333
14	MTS vs. ERCC	1.096482	0.272868	0.003571
13	MORF vs. ST	1.048809	0.294266	0.003846
12	SVRCC vs. SVRRC	0.667424	0.504501	0.004167
11	ST vs. MTSC	0.667424	0.504501	0.004545
10	ST vs. ERCC	0.619751	0.535422	0.005
9	MORF vs. MTS	0.572078	0.567269	0.005556
8	ST vs. ERC	0.524404	0.599997	0.00625
7	ERCC vs. SVR	0.524404	0.599997	0.007143
6	MORF vs. ERC	0.524404	0.599997	0.008333
5	ST vs. MTS	0.476731	0.633553	0.01
4	MORF vs. MTSC	0.381385	0.702918	0.0125
3	MTS vs. MTSC	0.190693	0.848767	0.016667
2	MTSC vs. ERC	0.143019	0.886275	0.025
1	MTS vs. ERC	0.047673	0.961977	0.05

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

2.2 P-values for $\alpha = 0.10$

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002222 .

Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.002941 .

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm
45	SVRCC vs. RC	5.48241	0	0.002222
44	RC vs. SVRRC	4.814986	0.000001	0.002273
43	SVRCC vs. MORF	4.052216	0.000051	0.002326
42	SVRCC vs. MTSC	3.670831	0.000242	0.002381
41	RC vs. SVR	3.623158	0.000291	0.002439
40	SVRCC vs. ERC	3.527812	0.000419	0.0025
39	SVRCC vs. MTS	3.480138	0.000501	0.002564
38	MORF vs. SVRRC	3.384792	0.000712	0.002632
37	RC vs. ERCC	3.098753	0.001943	0.002703
36	SVRCC vs. ST	3.003407	0.00267	0.002778
35	MTSC vs. SVRRC	3.003407	0.00267	0.002857
34	ERC vs. SVRRC	2.860388	0.004231	0.002941
33	MTS vs. SVRRC	2.812715	0.004913	0.00303
32	ST vs. RC	2.479003	0.013175	0.003125
31	SVRCC vs. ERCC	2.383656	0.017142	0.003226
30	ST vs. SVRRC	2.335983	0.019492	0.003333
29	MORF vs. SVR	2.192964	0.02831	0.003448
28	MTS vs. RC	2.002271	0.045256	0.003571
27	RC vs. ERC	1.954598	0.050631	0.003704
26	SVRCC vs. SVR	1.859252	0.062991	0.003846
25	MTSC vs. RC	1.811579	0.070051	0.004
24	MTSC vs. SVR	1.811579	0.070051	0.004167
23	ERCC vs. SVRRC	1.716233	0.086119	0.004348
22	ERC vs. SVR	1.66856	0.095205	0.004545
21	MORF vs. ERCC	1.66856	0.095205	0.004762
20	MTS vs. SVR	1.620886	0.105042	0.005
19	MORF vs. RC	1.430194	0.152661	0.005263
18	MTSC vs. ERCC	1.287174	0.198033	0.005556
17	SVR vs. SVRRC	1.191828	0.233329	0.005882
16	ERC vs. ERCC	1.144155	0.252559	0.00625
15	ST vs. SVR	1.144155	0.252559	0.006667
14	MTS vs. ERCC	1.096482	0.272868	0.007143
13	MORF vs. ST	1.048809	0.294266	0.007692
12	SVRCC vs. SVRRC	0.667424	0.504501	0.008333
11	ST vs. MTSC	0.667424	0.504501	0.009091
10	ST vs. ERCC	0.619751	0.535422	0.01
9	MORF vs. MTS	0.572078	0.567269	0.011111
8	ST vs. ERC	0.524404	0.599997	0.0125
7	ERCC vs. SVR	0.524404	0.599997	0.014286
6	MORF vs. ERC	0.524404	0.599997	0.016667
5	ST vs. MTS	0.476731	0.633553	0.02
4	MORF vs. MTSC	0.381385	0.702918	0.025
3	MTS vs. MTSC	0.190693	0.848767	0.033333
2	MTSC vs. ERC	0.143019	0.886275	0.05
1	MTS vs. ERC	0.047673	0.961977	0.1

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

2.3 Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}	p_{Holm}
1	SVRCC vs .RC	0	0.000002	0.000002
2	RC vs .SVRRC	0.000001	0.000066	0.000065
3	SVRCC vs .MORF	0.000051	0.002283	0.002182
4	SVRCC vs .MTSC	0.000242	0.010879	0.010154
5	RC vs .SVR	0.000291	0.013096	0.011932
6	SVRCC vs .ERC	0.000419	0.018855	0.01676
7	SVRCC vs .MTS	0.000501	0.022552	0.019545
8	MORF vs .SVRRC	0.000712	0.032054	0.027068
9	RC vs .ERCC	0.001943	0.087452	0.071905
10	SVRCC vs .ST	0.00267	0.120139	0.096111
11	MTSC vs .SVRRC	0.00267	0.120139	0.096111
12	ERC vs .SVRRC	0.004231	0.190405	0.143862
13	MTS vs .SVRRC	0.004913	0.221064	0.162113
14	ST vs .RC	0.013175	0.592876	0.421601
15	SVRCC vs .ERCC	0.017142	0.771372	0.531389
16	ST vs .SVRRC	0.019492	0.877145	0.584763
17	MORF vs .SVR	0.02831	1.273949	0.820989
18	MTS vs .RC	0.045256	2.0365	1.267155
19	RC vs .ERC	0.050631	2.278373	1.367024
20	SVRCC vs .SVR	0.062991	2.834614	1.637777
21	MTSC vs .RC	0.070051	3.152308	1.751282
22	MTSC vs .SVR	0.070051	3.152308	1.751282
23	ERCC vs .SVRRC	0.086119	3.875376	1.980748
24	ERC vs .SVR	0.095205	4.284212	2.094504
25	MORF vs .ERCC	0.095205	4.284212	2.094504
26	MTS vs .SVR	0.105042	4.72689	2.10084
27	MORF vs .RC	0.152661	6.869762	2.900566
28	MTSC vs .ERCC	0.198033	8.911506	3.564603
29	SVR vs .SVRRC	0.233329	10.499787	3.966586
30	ERC vs .ERCC	0.252559	11.365169	4.040949
31	ST vs .SVR	0.252559	11.365169	4.040949
32	MTS vs .ERCC	0.272868	12.279056	4.040949
33	MORF vs .ST	0.294266	13.241975	4.040949
34	SVRCC vs .SVRRC	0.504501	22.702566	6.054018
35	ST vs .MTSC	0.504501	22.702566	6.054018
36	ST vs .ERCC	0.535422	24.093987	6.054018
37	MORF vs .MTS	0.567269	25.527125	6.054018
38	ST vs .ERC	0.599997	26.999878	6.054018
39	ERCC vs .SVR	0.599997	26.999878	6.054018
40	MORF vs .ERC	0.599997	26.999878	6.054018
41	ST vs .MTS	0.633553	28.509906	6.054018
42	MORF vs .MTSC	0.702918	31.63129	6.054018
43	MTS vs .MTSC	0.848767	38.194493	6.054018
44	MTSC vs .ERC	0.886275	39.882369	6.054018
45	MTS vs .ERC	0.961977	43.288954	6.054018

Table 4: Adjusted p -values