# Output tables for the test of Multiple comparisons.

September 21, 2018

# 1 Average rankings of Friedman test

Average ranks obtained by applying the Friedman procedure

| Algorithm | Ranking |
|-----------|---------|
| Conf 1 | 4.8 |
| Conf 2 | 4.2 |
| Conf 3 | 2.8 |
| Conf 4 | 5.4 |
| Conf 5 | 3.6 |
| Conf 6 | 3.4 |
| Conf 7 | 3.8 |

Table 1: Average Rankings of the algorithms

Friedman statistic considering reduction performance (distributed according to chi-square with 6 degrees of freedom: 4.971429. P-value computed by Friedman Test: 0.5474828246699751.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 6 and 24 degrees of freedom: 0.794521.

P-value computed by Iman and Daveport Test: 0.5833663179134605.

# 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 | $z = (R_0 - R_i)/SE$ | $p$ |
|---|---|---|---|
| 21 | Conf 3 vs. Conf 4 | 1.903005 | 0.05704 |
| 20 | Conf 1 vs. Conf 3 | 1.46385 | 0.143235 |
| 19 | Conf 4 vs. Conf 6 | 1.46385 | 0.143235 |
| 18 | Conf 4 vs. Conf 5 | 1.317465 | 0.187683 |
| 17 | Conf 4 vs. Conf 7 | 1.17108 | 0.241567 |
| 16 | Conf 2 vs. Conf 3 | 1.024695 | 0.305507 |
| 15 | Conf 1 vs. Conf 6 | 1.024695 | 0.305507 |
| 14 | Conf 1 vs. Conf 5 | 0.87831 | 0.379775 |
| 13 | Conf 2 vs. Conf 4 | 0.87831 | 0.379775 |
| 12 | Conf 3 vs. Conf 7 | 0.731925 | 0.464214 |
| 11 | Conf 1 vs. Conf 7 | 0.731925 | 0.464214 |
| 10 | Conf 3 vs. Conf 5 | 0.58554 | 0.558185 |
| 9 | Conf 2 vs. Conf 6 | 0.58554 | 0.558185 |
| 8 | Conf 3 vs. Conf 6 | 0.439155 | 0.660549 |
| 7 | Conf 2 vs. Conf 5 | 0.439155 | 0.660549 |
| 6 | Conf 1 vs. Conf 2 | 0.439155 | 0.660549 |
| 5 | Conf 1 vs. Conf 4 | 0.439155 | 0.660549 |
| 4 | Conf 2 vs. Conf 7 | 0.29277 | 0.769698 |
| 3 | Conf 6 vs. Conf 7 | 0.29277 | 0.769698 |
| 2 | Conf 5 vs. Conf 7 | 0.146385 | 0.883617 |
| 1 | Conf 5 vs. Conf 6 | 0.146385 | 0.883617 |

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

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value $\leq 0.002381$.

## 2.2 P-values for $\alpha = 0.10$

| $i$ | algorithms | $z = (R_0 - R_i)/SE$ | $p$ |
|---|---|---|---|
| 21 | Conf 3 vs. Conf 4 | 1.903005 | 0.05704 |
| 20 | Conf 1 vs. Conf 3 | 1.46385 | 0.143235 |
| 19 | Conf 4 vs. Conf 6 | 1.46385 | 0.143235 |
| 18 | Conf 4 vs. Conf 5 | 1.317465 | 0.187683 |
| 17 | Conf 4 vs. Conf 7 | 1.17108 | 0.241567 |
| 16 | Conf 2 vs. Conf 3 | 1.024695 | 0.305507 |
| 15 | Conf 1 vs. Conf 6 | 1.024695 | 0.305507 |
| 14 | Conf 1 vs. Conf 5 | 0.87831 | 0.379775 |
| 13 | Conf 2 vs. Conf 4 | 0.87831 | 0.379775 |
| 12 | Conf 3 vs. Conf 7 | 0.731925 | 0.464214 |
| 11 | Conf 1 vs. Conf 7 | 0.731925 | 0.464214 |
| 10 | Conf 3 vs. Conf 5 | 0.58554 | 0.558185 |
| 9 | Conf 2 vs. Conf 6 | 0.58554 | 0.558185 |
| 8 | Conf 3 vs. Conf 6 | 0.439155 | 0.660549 |
| 7 | Conf 2 vs. Conf 5 | 0.439155 | 0.660549 |
| 6 | Conf 1 vs. Conf 2 | 0.439155 | 0.660549 |
| 5 | Conf 1 vs. Conf 4 | 0.439155 | 0.660549 |
| 4 | Conf 2 vs. Conf 7 | 0.29277 | 0.769698 |
| 3 | Conf 6 vs. Conf 7 | 0.29277 | 0.769698 |
| 2 | Conf 5 vs. Conf 7 | 0.146385 | 0.883617 |
| 1 | Conf 5 vs. Conf 6 | 0.146385 | 0.883617 |

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

Nemenyi's procedure rejects those hypotheses that have an unadjusted p-value $\leq 0.004762$.

## 2.3 Adjusted p-values

| i | hypothesis | unadjusted $p$ | $p_{Neme}$ |
|---|---|---|---|
| 1 | Conf 3 vs .Conf 4 | 0.05704 | 1.197837 |
| 2 | Conf 1 vs .Conf 3 | 0.143235 | 3.007933 |
| 3 | Conf 4 vs .Conf 6 | 0.143235 | 3.007933 |
| 4 | Conf 4 vs .Conf 5 | 0.187683 | 3.941338 |
| 5 | Conf 4 vs .Conf 7 | 0.241567 | 5.072898 |
| 6 | Conf 2 vs .Conf 3 | 0.305507 | 6.415649 |
| 7 | Conf 1 vs .Conf 6 | 0.305507 | 6.415649 |
| 8 | Conf 1 vs .Conf 5 | 0.379775 | 7.975285 |
| 9 | Conf 2 vs .Conf 4 | 0.379775 | 7.975285 |
| 10 | Conf 3 vs .Conf 7 | 0.464214 | 9.748501 |
| 11 | Conf 1 vs .Conf 7 | 0.464214 | 9.748501 |
| 12 | Conf 3 vs .Conf 5 | 0.558185 | 11.721878 |
| 13 | Conf 2 vs .Conf 6 | 0.558185 | 11.721878 |
| 14 | Conf 3 vs .Conf 6 | 0.660549 | 13.871533 |
| 15 | Conf 2 vs .Conf 5 | 0.660549 | 13.871533 |
| 16 | Conf 1 vs .Conf 2 | 0.660549 | 13.871533 |
| 17 | Conf 1 vs .Conf 4 | 0.660549 | 13.871533 |
| 18 | Conf 2 vs .Conf 7 | 0.769698 | 16.163657 |
| 19 | Conf 6 vs .Conf 7 | 0.769698 | 16.163657 |
| 20 | Conf 5 vs .Conf 7 | 0.883617 | 18.555967 |
| 21 | Conf 5 vs .Conf 6 | 0.883617 | 18.555967 |

Table 4: Adjusted $p$-values