

Results

April 6, 2021

1 Tables of Friedman, Bonferroni-Dunn, Holm, Hochberg and Hommel Tests

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Table 1: Average Rankings of the algorithms

Algorithm	Ranking
kmeans	2.8409090909090895
kmeans des	1.9772727272727266
kmeans desthr	1.1818181818181812

Friedman statistic considering reduction performance (distributed according to chi-square with 2 degrees of freedom: 30.29545454545432.
P-value computed by Friedman Test: 2.639360989764583E-7.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 2 and 42 degrees of freedom: 46.42288557213819.

P-value computed by Iman and Davenport Test: 2.2995938712792936E-11.

Bonferroni-Dunn’s procedure rejects those hypotheses that have a p-value ≤ 0.025 .

Table 2: Holm / Hochberg Table for $\alpha = 0.05$

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel
2	kmeans	5.502582038544183	3.742689727550662E-8	0.025
1	kmeans des	2.6382242650554315	0.00833414457781736	0.05

Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.05 .
Hommel's procedure rejects all hypotheses.

Table 3: Holm / Hochberg Table for $\alpha = 0.10$

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm/Hochberg/Hommel
2	kmeans	5.502582038544183	3.742689727550662E-8	0.05
1	kmeans des	2.6382242650554315	0.00833414457781736	0.1

Bonferroni-Dunn's procedure rejects those hypotheses that have a p-value ≤ 0.05 .
Hochberg's procedure rejects those hypotheses that have a p-value ≤ 0.1 .
Hommel's procedure rejects all hypotheses.

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Table 4: Adjusted p -values

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Hommel}
1	kmeans	3.742689727550662E-8	7.485379455101325E-8	7.485379455101325E-8	7.485379455101325E-8	7.485379455101325E-8
2	kmeans des	0.00833414457781736	0.01666828915563472	0.00833414457781736	0.00833414457781736	0.00833414457781736

Table 5: Holm / Shaffer Table for $\alpha = 0.05$

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm	Shaffer
3	kmeans vs. kmeans destr	5.502582038544183	3.742689727550662E-8	0.01666666666666666	0.01666666666666666
2	kmeans vs. kmeans des	2.8643577734887518	0.004178557568166542	0.025	0.05
1	kmeans des vs. kmeans destr	2.6382242650554315	0.00833414457781736	0.05	0.05

Nemenyi's procedure rejects those hypotheses that have a p-value ≤ 0.01666666666666666 .
Shaffer's procedure rejects those hypotheses that have a p-value ≤ 0.01666666666666666 .
Bergmann's procedure rejects these hypotheses:

- kmeans vs. kmeans des
- kmeans vs. kmeans desthr
- kmeans des vs. kmeans desthr

Table 6: Holm / Shaffer Table for $\alpha = 0.10$

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm	Shaffer
3	kmeans vs. kmeans desthr	5.502582038544183	3.742689727550662E-8	0.03333333333333333	0.03333333333333333
2	kmeans vs. kmeans des	2.8643577734887518	0.004178557568166542	0.05	0.1
1	kmeans des vs. kmeans desthr	2.6382242650554315	0.00833414457781736	0.1	0.1

Nemenyi's procedure rejects those hypotheses that have a p-value ≤ 0.03333333333333333 .

Shaffer's procedure rejects those hypotheses that have a p-value ≤ 0.03333333333333333 .

Bergmann's procedure rejects these hypotheses:

- kmeans vs. kmeans des
- kmeans vs. kmeans desthr
- kmeans des vs. kmeans desthr

Table 7: Adjusted p -values

i	hypothesis	unadjusted p	p_{Nemen}	p_{Holm}	p_{Shaf}	p_{Berg}
1	kmeans vs kmeans desthr	3.742689727550662E-8	1.1228069182651986E-8	1.1228069182651986E-7	1.1228069182651986E-7	1.1228069182651986E-7
2	kmeans vs kmeans des	0.004178557568166542	0.012535672704499626	0.008357115136333084	0.004178557568166542	0.004178557568166542
3	kmeans des vs kmeans desthr	0.00833414457781736	0.02500243373345208	0.008357115136333084	0.00833414457781736	0.00833414457781736