Results

April 6, 2021

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

Table 1: Average Rankings of the algorithms

Algorithm	Ranking
kmeans	2.477272727272726
kmeans des	2.2045454545454537
kmeans desthr	1.3181818181818177

Friedman statistic considering reduction performance (distributed according to chi-square with 2 degrees of freedom: 16.15909090909065.
P-value computed by Friedman Test: 3.098118366365865E-4.

Iman and Davenport statistic considering reduction performance (distributed according to F-distribution with 2 and 42 degrees of freedom: 12.188571428571121.
P-value computed by Iman and Daveport Test: 6.6964626410927E-5.

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	3.8442696433664842	1.2091200127797409E-4	0.025
1	kmeans des	2.939735609633194	0.0032849241616237554	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	3.8442696433664842	1.2091200127797409E-4	0.05
1	kmeans des	2.939735609633194	0.0032849241616237554	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.

Table 4: Adjusted p-values

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	p_{Hoch}	p_{Homm}
1	kmeans	1.2091200127797409E-4	2.4182400255594818E-4	2.4182400255594818E-4	2.4182400255594818E-4	2.4182400255594818E-4
2	kmeans des	0.0032849241616237554	0.006569848323247511	0.0032849241616237554	0.0032849241616237554	0.0032849241616237554

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

i	algorithms	$z = (R_0 - R_i)/SE$	p	Holm	Shaffer
3	kmeans vs. kmeans desthr	3.8442696433664842	1.2091200127797409E-4	0.016666666666666666	0.016666666666666666
2	kmeans des vs. kmeans desthr	2.939735609633194	0.0032849241616237554	0.025	0.05
1	kmeans vs. kmeans des	0.90453403373329	0.3657122962815137	0.05	0.05

Nemenyi's procedure rejects those hypotheses that have a p-value $\leq 0.016666666666666666$.
Holm's procedure rejects those hypotheses that have a p-value ≤ 0.05.

Shaffer's procedure rejects those hypotheses that have a p-value $\leq 0.016666666666666666$.
Bergmann's procedure rejects these hypotheses:

- 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	3.8442696433664842	1.2091200127797409E-4	0.03333333333333333	0.03333333333333333
2	kmeans des vs. kmeans desthr	2.939735609633194	0.0032849241616237554	0.05	0.1
1	kmeans vs. kmeans des	0.90453403373329	0.3657122962815137	0.1	0.1

Nemenyi's procedure rejects those hypotheses that have a p-value ≤ 0.03333333333333333.
Holm's procedure rejects those hypotheses that have a p-value ≤ 0.1.
Shaffer's procedure rejects those hypotheses that have a p-value ≤ 0.03333333333333333.
Bergmann's procedure rejects these hypotheses:

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

Table 7: Adjusted p-values

i	hypothesis	unadjusted p	p_{Neme}	p_{Holm}	p_{Shaf}	p_{Berg}
1	kmeans vs .kmeans desthr	1.2091200127797409E-4	3.627360038339223E-4	3.627360038339223E-4	3.627360038339223E-4	3.627360038339223E-4
2	kmeans des vs .kmeans desthr	0.0032849241616237554	0.009854772484871266	0.006569848323247511	0.0032849241616237554	0.0032849241616237554
3	kmeans vs .kmeans des	0.3657122962815137	1.097136888844541	0.3657122962815137	0.3657122962815137	0.3657122962815137