Output tables for 1xN statistical comparisons.

June 12, 2025

1 Average rankings of Friedman test

Average ranks obtained by each method in the Friedman test.

Friedman statistic (distributed according to chi-square with 15 degrees of freedom): 332.865809.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 15 and 525 degrees of freedom): 56.245197.
P-value computed by Iman and Daveport Test: -0.

Algorithm	Ranking
BestCyclicAssignment	13.0278
BestNearest	6.7361
CLARA	10
CoefficientPropagation	11.3472
CyclicAssignment	13.9722
Farthest-First	3.25
KMEANS	4.2639
NearestByCustomer	7.3056
NearestByDepot	10.9167
PAM	8.4722
Parallel	7.3056
RandomByElement	15.9167
Simplified	6.4722
Sweep	6.4861
ThreeCriteriaClustering	3.3472
UPGMC	7.1806

Table 1: Average Rankings of the algorithms (Friedman)

2 Post hoc comparison (Friedman)

P-values obtained in by applying post hoc methods over the results of Friedman procedure.

i	algorithm	$z = (R_0 - R_i)/SE$	p	Holm Hochberg Hommel	Holland	Rom	Finner	Li
15	RandomByElement	11.287682	0	0.003333	0.003414	0.003507	0.003414	0.003634
14	CyclicAssignment	9.554924	0	0.003571	0.003657	0.003757	0.006816	0.003634
13	BestCyclicAssignment	8.713298	0	0.003846	0.003938	0.004046	0.010206	0.003634
12	CoefficientPropagation	7.2157	0	0.004167	0.004265	0.004383	0.013585	0.003634
11	NearestByDepot	6.832018	0	0.004545	0.004652	0.004782	0.016952	0.003634
10	CLARA	6.015146	0	0.005	0.005116	0.00526	0.020308	0.003634
9	PAM	4.653693	0.000003	0.005556	0.005683	0.005844	0.023653	0.003634
8	NearestByCustomer	3.614039	0.000301	0.00625	0.006391	0.006574	0.026986	0.003634
7	Parallel	3.614039	0.000301	0.007143	0.007301	0.007513	0.030307	0.003634
6	UPGMC	3.502647	0.000461	0.008333	0.008512	0.008764	0.033617	0.003634
5	BestNearest	3.106588	0.001893	0.01	0.010206	0.010515	0.036916	0.003634
4	Sweep	2.883805	0.003929	0.0125	0.012741	0.013109	0.040204	0.003634
3	Simplified	2.871428	0.004086	0.016667	0.016952	0.016667	0.043481	0.003634
2	KMEANS	0.90351	0.366255	0.025	0.025321	0.025	0.046746	0.003634
1	ThreeCriteriaClustering	0.086638	0.930959	0.05	0.05	0.05	0.05	0.05

Table 2: Post Hoc comparison Table for $\alpha = 0.05$ (FRIEDMAN)

Bonferroni-Dunn's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.003333.
Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.025.
Hochberg's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.016667.
Hommel's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.025.
Holland's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.025321.
Rom's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.016667.
Finner's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.046746.
Li's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.003634.

3 Adjusted P-Values (Friedman)

Adjusted P-values obtained through the application of the post hoc methods (Friedman).

i	algorithm	unadjusted p	p_{Bonf}	p_{Holm}	$p_{Hochberg}$	p_{Hommel}
1	RandomByElement	0	0	0	0	0
2	CyclicAssignment	0	0	0	0	0
3	BestCyclicAssignment	0	0	0	0	0
4	CoefficientPropagation	0	0	0	0	0
5	NearestByDepot	0	0	0	0	0
6	CLARA	0	0	0	0	0
7	PAM	0.000003	0.000049	0.000029	0.000029	0.000029
8	NearestByCustomer	0.000301	0.004522	0.002412	0.00211	0.001809
9	Parallel	0.000301	0.004522	0.002412	0.00211	0.001809
10	UPGMC	0.000461	0.00691	0.002764	0.002764	0.002764
11	BestNearest	0.001893	0.028389	0.009463	0.009463	0.00757
12	Sweep	0.003929	0.058935	0.015716	0.012259	0.011787
13	Simplified	0.004086	0.061293	0.015716	0.012259	0.012259
14	KMEANS	0.366255	5.493832	0.732511	0.732511	0.732511
15	ThreeCriteriaClustering	0.930959	13.96439	0.930959	0.930959	0.930959

Table 3: Adjusted p-values (FRIEDMAN) (I)

i	algorithm	unadjusted p	$p_{Holland}$	p_{Rom}	p_{Finner}	p_{Li}
1	RandomByElement	0	0	0	0	0
2	CyclicAssignment	0	0	0	0	0
3	BestCyclicAssignment	0	0	0	0	0
4	CoefficientPropagation	0	0	0	0	0
5	NearestByDepot	0	0	0	0	0
6	CLARA	0	0	0	0	0
7	PAM	0.000003	0.000029	0.000028	0.000007	0.0000
8	NearestByCustomer	0.000301	0.002409	0.002006	0.000565	0.0043
9	Parallel	0.000301	0.002409	0.002006	0.000565	0.0043
10	UPGMC	0.000461	0.002761	0.002628	0.000691	0.0066
11	BestNearest	0.001893	0.009427	0.008999	0.00258	0.0266
12	Sweep	0.003929	0.015624	0.012259	0.004909	0.0538
13	Simplified	0.004086	0.015624	0.012259	0.004909	0.0558
14	KMEANS	0.366255	0.598368	0.732511	0.38657	0.8413
15	ThreeCriteriaClustering	0.930959	0.930959	0.930959	0.930959	0.9309

Table 4: Adjusted p-values (FRIEDMAN) (II)