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): 278.220588.

P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 15 and 525 degrees of freedom): 37.198191.

P-value computed by Iman and Daveport Test: 0.

Algorithm	Ranking
BestCyclicAssignment	8.7778
BestNearest	7.5972
CLARA	10.125
CoefficientPropagation	7.3889
CyclicAssignment	13.8056
Farthest-First	5.5833
KMEANS	5.5139
NearestByCustomer	8.5972
NearestByDepot	12.1389
PAM	10.1389
Parallel	8.5972
RandomByElement	15.6528
Simplified	7.7083
Sweep	7.4167
ThreeCriteriaClustering	5.1389
UPGMC	1.8194

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	12.327337	0	0.003333	0.003414	0.003507	0.003414	0.052469
14	CyclicAssignment	10.681217	0	0.003571	0.003657	0.003757	0.006816	0.052469
13	NearestByDepot	9.195995	0	0.003846	0.003938	0.004046	0.010206	0.052469
12	PAM	7.41373	0	0.004167	0.004265	0.004383	0.013585	0.052469
11	CLARA	7.401353	0	0.004545	0.004652	0.004782	0.016952	0.052469
10	BestCyclicAssignment	6.200799	0	0.005	0.005116	0.00526	0.020308	0.052469
9	NearestByCustomer	6.0399	0	0.005556	0.005683	0.005844	0.023653	0.052469
8	Parallel	6.0399	0	0.00625	0.006391	0.006574	0.026986	0.052469
7	Simplified	5.247782	0	0.007143	0.007301	0.007513	0.030307	0.052469
6	BestNearest	5.148767	0	0.008333	0.008512	0.008764	0.033617	0.052469
5	Sweep	4.987868	0.000001	0.01	0.010206	0.010515	0.036916	0.052469
4	CoefficientPropagation	4.963115	0.000001	0.0125	0.012741	0.013109	0.040204	0.052469
3	Farthest-First	3.354125	0.000796	0.016667	0.016952	0.016667	0.043481	0.052469
2	KMEANS	3.292241	0.000994	0.025	0.025321	0.025	0.046746	0.052469
1	ThreeCriteriaClustering	2.958066	0.003096	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.
Hochberg's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.05.
Hommel's procedure rejects all hypotheses.
Rom's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.05.
Li's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.05.

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	NearestByDepot	0	0	0	0	0
4	PAM	0	0	0	0	0
5	CLARA	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	NearestByCustomer	0	0	0	0	0
8	Parallel	0	0	0	0	0
9	Simplified	0	0.000002	0.000001	0.000001	0.000001
10	BestNearest	0	0.000004	0.000002	0.000002	0.000001
11	Sweep	0.000001	0.000009	0.000003	0.000003	0.000002
12	CoefficientPropagation	0.000001	0.00001	0.000003	0.000003	0.000003
13	Farthest-First	0.000796	0.011942	0.002388	0.001988	0.001592
14	KMEANS	0.000994	0.014909	0.002388	0.001988	0.001988
15	ThreeCriteriaClustering	0.003096	0.046436	0.003096	0.003096	0.003096

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	NearestByDepot	0	0	0	0	0
4	PAM	0	0	0	0	0
5	CLARA	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	NearestByCustomer	0	0	0	0	0
8	Parallel	0	0	0	0	0
9	Simplified	0	0.000001	0.000001	0	0
10	BestNearest	0	0.000002	0.000001	0	0
11	Sweep	0.000001	0.000003	0.000003	0.000001	0.0000
12	CoefficientPropagation	0.000001	0.000003	0.000003	0.000001	0.0000
13	Farthest-First	0.000796	0.002387	0.001988	0.000919	0.0007
14	KMEANS	0.000994	0.002387	0.001988	0.001065	0.0009
15	ThreeCriteriaClustering	0.003096	0.003096	0.003096	0.003096	0.0030

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