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): 291.27451.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 15 and 525 degrees of freedom): 40.987387.
P-value computed by Iman and Daveport Test: 0.

Algorithm	Ranking
BestCyclicAssignment	11.8611
BestNearest	7.0417
CLARA	10.0556
CoefficientPropagation	9.3056
CyclicAssignment	14.6944
Farthest-First	4.25
KMEANS	5.1528
NearestByCustomer	6.6111
NearestByDepot	11.6667
PAM	8.1389
Parallel	6.6111
RandomByElement	16
Simplified	6.2222
Sweep	6.2083
ThreeCriteriaClustering	4.7361
UPGMC	7.4444

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	10.47081	0	0.003333	0.003414	0.003507	0.003414	0.017638
14	CyclicAssignment	9.307387	0	0.003571	0.003657	0.003757	0.006816	0.017638
13	BestCyclicAssignment	6.782511	0	0.003846	0.003938	0.004046	0.010206	0.017638
12	NearestByDepot	6.609235	0	0.004167	0.004265	0.004383	0.013585	0.017638
11	CLARA	5.173521	0	0.004545	0.004652	0.004782	0.016952	0.017638
10	CoefficientPropagation	4.505171	0.000007	0.005	0.005116	0.00526	0.020308	0.017638
9	PAM	3.465516	0.000529	0.005556	0.005683	0.005844	0.023653	0.017638
8	UPGMC	2.846674	0.004418	0.00625	0.006391	0.006574	0.026986	0.017638
7	BestNearest	2.487746	0.012856	0.007143	0.007301	0.007513	0.030307	0.017638
6	NearestByCustomer	2.104064	0.035373	0.008333	0.008512	0.008764	0.033617	0.017638
5	Parallel	2.104064	0.035373	0.01	0.010206	0.010515	0.036916	0.017638
4	Simplified	1.757512	0.078831	0.0125	0.012741	0.013109	0.040204	0.017638
3	Sweep	1.745135	0.080961	0.016667	0.016952	0.016667	0.043481	0.017638
2	KMEANS	0.804495	0.421111	0.025	0.025321	0.025	0.046746	0.017638
1	ThreeCriteriaClustering	0.43319	0.664877	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 ≤ 0.007143.
Hochberg's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.00625.
Hommel's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.007143.
Holland's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.007301.
Rom's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.006574.
Finner's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.033617.
Li's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.017638.

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	NearestByDepot	0	0	0	0	0
5	CLARA	0	0.000003	0.000003	0.000003	0.000003
6	CoefficientPropagation	0.000007	0.000099	0.000066	0.000066	0.000066
7	PAM	0.000529	0.007938	0.004763	0.004763	0.004763
8	UPGMC	0.004418	0.066268	0.035343	0.035343	0.035343
9	BestNearest	0.012856	0.192833	0.089989	0.089989	0.082537
10	NearestByCustomer	0.035373	0.530594	0.212237	0.176865	0.141492
11	Parallel	0.035373	0.530594	0.212237	0.176865	0.141492
12	Simplified	0.078831	1.182459	0.315322	0.242884	0.236492
13	Sweep	0.080961	1.21442	0.315322	0.242884	0.242884
14	KMEANS	0.421111	6.316668	0.842222	0.664877	0.664877
15	ThreeCriteriaClustering	0.664877	9.973156	0.842222	0.664877	0.664877

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	NearestByDepot	0	0	0	0	0
5	CLARA	0	0.000003	0.000002	0.000001	0.0000
6	CoefficientPropagation	0.000007	0.000066	0.000063	0.000017	0.000
7	PAM	0.000529	0.004753	0.004528	0.001134	0.0015
8	UPGMC	0.004418	0.034801	0.0336	0.008267	0.0130
9	BestNearest	0.012856	0.086592	0.085557	0.021334	0.0369
10	NearestByCustomer	0.035373	0.194331	0.168197	0.052587	0.0954
11	Parallel	0.035373	0.194331	0.168197	0.052587	0.0954
12	Simplified	0.078831	0.279958	0.242884	0.097547	0.1904
13	Sweep	0.080961	0.279958	0.242884	0.097547	0.1945
14	KMEANS	0.421111	0.664888	0.664877	0.443279	0.5568
15	ThreeCriteriaClustering	0.664877	0.664888	0.664877	0.664877	0.6648

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