Output tables for 1xN statistical comparisons.

June 6, 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 17 degrees of freedom): 288.096842.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 17 and 408 degrees of freedom): 50.505221.
P-value computed by Iman and Daveport Test: -0.

Algorithm	Ranking
BestCyclicAssignment	9.96
BestNearest	6.6
CLARA	10.64
CoefficientPropagation	8.36
CyclicAssignment	14.12
Farthest-First	5.62
KMEANS	6.28
NearestByCustomer	8.22
NearestByDepot	10.96
PAM	18
Parallel	8.22
RandomByElement	16.74
RandomSequentialCyclic	13.8
SequentialCyclic	13.84
Simplified	6.88
Sweep	6.42
ThreeCriteriaClustering	4.98
UPGMC	1.36

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
17	PAM	11.020109	0	0.002941	0.003013	0.003094	0.003013	0.051763
16	RandomByElement	10.185654	0	0.003125	0.003201	0.003288	0.006016	0.051763
15	CyclicAssignment	8.450516	0	0.003333	0.003414	0.003507	0.009011	0.051763
14	SequentialCyclic	8.265082	0	0.003571	0.003657	0.003757	0.011996	0.051763
13	RandomSequentialCyclic	8.238591	0	0.003846	0.003938	0.004046	0.014973	0.051763
12	NearestByDepot	6.357755	0	0.004167	0.004265	0.004383	0.017941	0.051763
11	CLARA	6.14583	0	0.004545	0.004652	0.004782	0.020899	0.051763
10	BestCyclicAssignment	5.695489	0	0.005	0.005116	0.00526	0.023849	0.051763
9	CoefficientPropagation	4.635863	0.000004	0.005556	0.005683	0.005844	0.02679	0.051763
8	NearestByCustomer	4.543146	0.000006	0.00625	0.006391	0.006574	0.029722	0.051763
7	Parallel	4.543146	0.000006	0.007143	0.007301	0.007513	0.032645	0.051763
6	Simplified	3.655709	0.000256	0.008333	0.008512	0.008764	0.035559	0.051763
5	BestNearest	3.470275	0.00052	0.01	0.010206	0.010515	0.038465	0.051763
4	Sweep	3.351067	0.000805	0.0125	0.012741	0.013109	0.041362	0.051763
3	KMEANS	3.25835	0.001121	0.016667	0.016952	0.016667	0.04425	0.051763
2	Farthest-First	2.821254	0.004784	0.025	0.025321	0.025	0.047129	0.051763
1	ThreeCriteriaClustering	2.397404	0.016512	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 ≤ 0.002941.
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	PAM	0	0	0	0	0
2	RandomByElement	0	0	0	0	0
3	CyclicAssignment	0	0	0	0	0
4	SequentialCyclic	0	0	0	0	0
5	RandomSequentialCyclic	0	0	0	0	0
6	NearestByDepot	0	0	0	0	0
7	CLARA	0	0	0	0	0
8	BestCyclicAssignment	0	0	0	0	0
9	CoefficientPropagation	0.000004	0.00006	0.000032	0.000032	0.000025
10	NearestByCustomer	0.000006	0.000094	0.000044	0.000039	0.000039
11	Parallel	0.000006	0.000094	0.000044	0.000039	0.000039
12	Simplified	0.000256	0.00436	0.001539	0.001539	0.001539
13	BestNearest	0.00052	0.008839	0.0026	0.0026	0.00208
14	Sweep	0.000805	0.013685	0.00322	0.00322	0.002415
15	KMEANS	0.001121	0.019051	0.003362	0.003362	0.003362
16	Farthest-First	0.004784	0.081322	0.009567	0.009567	0.009567
17	ThreeCriteriaClustering	0.016512	0.280699	0.016512	0.016512	0.016512

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

i	algorithm	unadjusted p	$p_{Holland}$	p_{Rom}	p_{Finner}	p_{L}
1	PAM	0	0	0	0	0
2	RandomByElement	0	0	0	0	0
3	CyclicAssignment	0	0	0	0	0
4	SequentialCyclic	0	0	0	0	0
5	RandomSequentialCyclic	0	0	0	0	0
6	NearestByDepot	0	0	0	0	0
7	CLARA	0	0	0	0	0
8	BestCyclicAssignment	0	0	0	0	0
9	CoefficientPropagation	0.000004	0.000032	0.00003	0.000007	0.000
10	NearestByCustomer	0.000006	0.000044	0.000037	0.000009	0.000
11	Parallel	0.000006	0.000044	0.000037	0.000009	0.000
12	Simplified	0.000256	0.001538	0.001463	0.000363	0.000
13	BestNearest	0.00052	0.002597	0.002472	0.00068	0.000
14	Sweep	0.000805	0.003216	0.00307	0.000977	0.000
15	KMEANS	0.001121	0.003358	0.003362	0.00127	0.001
16	Farthest-First	0.004784	0.009544	0.009567	0.005082	0.004
17	ThreeCriteriaClustering	0.016512	0.016512	0.016512	0.016512	0.016

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