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): 342.880702.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 17 and 408 degrees of freedom): 100.209537.
P-value computed by Iman and Daveport Test: 0.

Algorithm	Ranking
BestCyclicAssignment	13.48
BestNearest	7.22
CLARA	12.04
CoefficientPropagation	11.96
CyclicAssignment	15.04
Farthest-First	5.74
KMEANS	6.38
NearestByCustomer	6.84
NearestByDepot	10.68
PAM	1
Parallel	6.84
RandomByElement	17.96
RandomSequentialCyclic	16.16
SequentialCyclic	16.24
Simplified	5.52
Sweep	5.74
ThreeCriteriaClustering	6.44
UPGMC	5.72

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	RandomByElement	11.232034	0	0.002941	0.003013	0.003094	0.003013	0.052486
16	SequentialCyclic	10.092937	0	0.003125	0.003201	0.003288	0.006016	0.052486
15	RandomSequentialCyclic	10.039955	0	0.003333	0.003414	0.003507	0.009011	0.052486
14	CyclicAssignment	9.298217	0	0.003571	0.003657	0.003757	0.011996	0.052486
13	BestCyclicAssignment	8.265082	0	0.003846	0.003938	0.004046	0.014973	0.052486
12	CLARA	7.311419	0	0.004167	0.004265	0.004383	0.017941	0.052486
11	CoefficientPropagation	7.258437	0	0.004545	0.004652	0.004782	0.020899	0.052486
10	NearestByDepot	6.410737	0	0.005	0.005116	0.00526	0.023849	0.052486
9	BestNearest	4.119296	0.000038	0.005556	0.005683	0.005844	0.02679	0.052486
8	NearestByCustomer	3.867634	0.00011	0.00625	0.006391	0.006574	0.029722	0.052486
7	Parallel	3.867634	0.00011	0.007143	0.007301	0.007513	0.032645	0.052486
6	ThreeCriteriaClustering	3.602728	0.000315	0.008333	0.008512	0.008764	0.035559	0.052486
5	KMEANS	3.562992	0.000367	0.01	0.010206	0.010515	0.038465	0.052486
4	Farthest-First	3.139142	0.001694	0.0125	0.012741	0.013109	0.041362	0.052486
3	Sweep	3.139142	0.001694	0.016667	0.016952	0.016667	0.04425	0.052486
2	UPGMC	3.125896	0.001773	0.025	0.025321	0.025	0.047129	0.052486
1	Simplified	2.993443	0.002758	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	RandomByElement	0	0	0	0	0
2	SequentialCyclic	0	0	0	0	0
3	RandomSequentialCyclic	0	0	0	0	0
4	CyclicAssignment	0	0	0	0	0
5	BestCyclicAssignment	0	0	0	0	0
6	CLARA	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	BestNearest	0.000038	0.000646	0.000342	0.000342	0.00033
10	NearestByCustomer	0.00011	0.001868	0.000879	0.000769	0.000769
11	Parallel	0.00011	0.001868	0.000879	0.000769	0.000769
12	ThreeCriteriaClustering	0.000315	0.005353	0.001889	0.001833	0.001574
13	KMEANS	0.000367	0.006233	0.001889	0.001833	0.001833
14	Farthest-First	0.001694	0.028805	0.006778	0.002758	0.002758
15	Sweep	0.001694	0.028805	0.006778	0.002758	0.002758
16	UPGMC	0.001773	0.030135	0.006778	0.002758	0.002758
17	Simplified	0.002758	0.046894	0.006778	0.002758	0.002758

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

i	algorithm	unadjusted p	$p_{Holland}$	p_{Rom}	p_{Finner}	p_{L}
1	RandomByElement	0	0	0	0	0
2	SequentialCyclic	0	0	0	0	0
3	RandomSequentialCyclic	0	0	0	0	0
4	CyclicAssignment	0	0	0	0	0
5	BestCyclicAssignment	0	0	0	0	0
6	CLARA	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	BestNearest	0.000038	0.000342	0.000325	0.000072	0.000
10	NearestByCustomer	0.00011	0.000879	0.000731	0.000187	0.000
11	Parallel	0.00011	0.000879	0.000731	0.000187	0.000
12	ThreeCriteriaClustering	0.000315	0.001888	0.001743	0.000446	0.000
13	KMEANS	0.000367	0.001888	0.001743	0.000479	0.000
14	Farthest-First	0.001694	0.006761	0.002758	0.002057	0.001
15	Sweep	0.001694	0.006761	0.002758	0.002057	0.001
16	UPGMC	0.001773	0.006761	0.002758	0.002057	0.001
17	Simplified	0.002758	0.006761	0.002758	0.002758	0.002

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