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): 353.454737.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 17 and 408 degrees of freedom): 118.56709.
P-value computed by Iman and Daveport Test: -0.

Algorithm	Ranking
BestCyclicAssignment	13.44
BestNearest	7.5
CLARA	12.12
CoefficientPropagation	12.52
CyclicAssignment	15.08
Farthest-First	5.38
KMEANS	5.86
NearestByCustomer	7.2
NearestByDepot	11.2
PAM	1
Parallel	7.2
RandomByElement	17.92
RandomSequentialCyclic	16.16
SequentialCyclic	16.04
Simplified	6.08
Sweep	6.18
ThreeCriteriaClustering	4.76
UPGMC	5.36

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	RandomByElement	11.205544	0	0.002941	0.003013	0.003094	0.003013	0.051959
16	RandomSequentialCyclic	10.039955	0	0.003125	0.003201	0.003288	0.006016	0.051959
15	SequentialCyclic	9.960483	0	0.003333	0.003414	0.003507	0.009011	0.051959
14	CyclicAssignment	9.324708	0	0.003571	0.003657	0.003757	0.011996	0.051959
13	BestCyclicAssignment	8.238591	0	0.003846	0.003938	0.004046	0.014973	0.051959
12	CoefficientPropagation	7.629306	0	0.004167	0.004265	0.004383	0.017941	0.051959
11	CLARA	7.3644	0	0.004545	0.004652	0.004782	0.020899	0.051959
10	NearestByDepot	6.755115	0	0.005	0.005116	0.00526	0.023849	0.051959
9	BestNearest	4.30473	0.000017	0.005556	0.005683	0.005844	0.02679	0.051959
8	NearestByCustomer	4.10605	0.00004	0.00625	0.006391	0.006574	0.029722	0.051959
7	Parallel	4.10605	0.00004	0.007143	0.007301	0.007513	0.032645	0.051959
6	Sweep	3.430539	0.000602	0.008333	0.008512	0.008764	0.035559	0.051959
5	Simplified	3.364312	0.000767	0.01	0.010206	0.010515	0.038465	0.051959
4	KMEANS	3.218614	0.001288	0.0125	0.012741	0.013109	0.041362	0.051959
3	Farthest-First	2.900726	0.003723	0.016667	0.016952	0.016667	0.04425	0.051959
2	UPGMC	2.887481	0.003883	0.025	0.025321	0.025	0.047129	0.051959
1	ThreeCriteriaClustering	2.490121	0.01277	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	RandomSequentialCyclic	0	0	0	0	0
3	SequentialCyclic	0	0	0	0	0
4	CyclicAssignment	0	0	0	0	0
5	BestCyclicAssignment	0	0	0	0	0
6	CoefficientPropagation	0	0	0	0	0
7	CLARA	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	BestNearest	0.000017	0.000284	0.00015	0.00015	0.000134
10	NearestByCustomer	0.00004	0.000684	0.000322	0.000282	0.000282
11	Parallel	0.00004	0.000684	0.000322	0.000282	0.000282
12	Sweep	0.000602	0.010241	0.003614	0.003614	0.003012
13	Simplified	0.000767	0.013045	0.003837	0.003837	0.00322
14	KMEANS	0.001288	0.021898	0.005152	0.005152	0.005152
15	Farthest-First	0.003723	0.063291	0.011169	0.007767	0.007446
16	UPGMC	0.003883	0.066018	0.011169	0.007767	0.007767
17	ThreeCriteriaClustering	0.01277	0.217089	0.01277	0.01277	0.01277

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	RandomSequentialCyclic	0	0	0	0	0
3	SequentialCyclic	0	0	0	0	0
4	CyclicAssignment	0	0	0	0	0
5	BestCyclicAssignment	0	0	0	0	0
6	CoefficientPropagation	0	0	0	0	0
7	CLARA	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	BestNearest	0.000017	0.00015	0.000143	0.000032	0.000
10	NearestByCustomer	0.00004	0.000322	0.000268	0.000068	0.000
11	Parallel	0.00004	0.000322	0.000268	0.000068	0.000
12	Sweep	0.000602	0.003609	0.003437	0.000853	0.000
13	Simplified	0.000767	0.003831	0.003649	0.001003	0.000
14	KMEANS	0.001288	0.005143	0.004913	0.001564	0.001
15	Farthest-First	0.003723	0.011127	0.007767	0.004218	0.003
16	UPGMC	0.003883	0.011127	0.007767	0.004218	0.003
17	ThreeCriteriaClustering	0.01277	0.01277	0.01277	0.01277	0.012

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