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): 350.077895.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 17 and 408 degrees of freedom): 112.141396.
P-value computed by Iman and Daveport Test: 0.

Algorithm	Ranking
BestCyclicAssignment	12.56
BestNearest	6.46
CLARA	10.76
CoefficientPropagation	11.52
CyclicAssignment	14.28
Farthest-First	4.3
KMEANS	4.78
NearestByCustomer	6.16
NearestByDepot	10.2
PAM	16.92
Parallel	6.16
RandomByElement	18
RandomSequentialCyclic	15.04
SequentialCyclic	14.92
Simplified	4.96
Sweep	5.06
ThreeCriteriaClustering	3.64
UPGMC	5.28

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	9.510142	0	0.002941	0.003013	0.003094	0.003013	0.017787
16	PAM	8.794895	0	0.003125	0.003201	0.003288	0.006016	0.017787
15	RandomSequentialCyclic	7.549834	0	0.003333	0.003414	0.003507	0.009011	0.017787
14	SequentialCyclic	7.470362	0	0.003571	0.003657	0.003757	0.011996	0.017787
13	CyclicAssignment	7.046512	0	0.003846	0.003938	0.004046	0.014973	0.017787
12	BestCyclicAssignment	5.907414	0	0.004167	0.004265	0.004383	0.017941	0.017787
11	CoefficientPropagation	5.218657	0	0.004545	0.004652	0.004782	0.020899	0.017787
10	CLARA	4.715335	0.000002	0.005	0.005116	0.00526	0.023849	0.017787
9	NearestByDepot	4.344466	0.000014	0.005556	0.005683	0.005844	0.02679	0.017787
8	BestNearest	1.867591	0.061819	0.00625	0.006391	0.006574	0.029722	0.017787
7	NearestByCustomer	1.668911	0.095135	0.007143	0.007301	0.007513	0.032645	0.017787
6	Parallel	1.668911	0.095135	0.008333	0.008512	0.008764	0.035559	0.017787
5	UPGMC	1.086117	0.277427	0.01	0.010206	0.010515	0.038465	0.017787
4	Sweep	0.940418	0.347003	0.0125	0.012741	0.013109	0.041362	0.017787
3	Simplified	0.874191	0.382014	0.016667	0.016952	0.016667	0.04425	0.017787
2	KMEANS	0.754983	0.450259	0.025	0.025321	0.025	0.047129	0.017787
1	Farthest-First	0.437096	0.662042	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.
Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.00625.
Hochberg's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.005556.
Hommel's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.00625.
Holland's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.006391.
Rom's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.005844.
Finner's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.029722.
Li's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.017787.

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	PAM	0	0	0	0	0
3	RandomSequentialCyclic	0	0	0	0	0
4	SequentialCyclic	0	0	0	0	0
5	CyclicAssignment	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	CoefficientPropagation	0	0.000003	0.000002	0.000002	0.000002
8	CLARA	0.000002	0.000041	0.000024	0.000024	0.000024
9	NearestByDepot	0.000014	0.000237	0.000126	0.000126	0.000126
10	BestNearest	0.061819	1.050926	0.494553	0.494553	0.370915
11	NearestByCustomer	0.095135	1.617296	0.665945	0.57081	0.540311
12	Parallel	0.095135	1.617296	0.665945	0.57081	0.540311
13	UPGMC	0.277427	4.716266	1.387137	0.662042	0.662042
14	Sweep	0.347003	5.899055	1.388013	0.662042	0.662042
15	Simplified	0.382014	6.494239	1.388013	0.662042	0.662042
16	KMEANS	0.450259	7.654402	1.388013	0.662042	0.662042
17	Farthest-First	0.662042	11.254713	1.388013	0.662042	0.662042

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	PAM	0	0	0	0	0
3	RandomSequentialCyclic	0	0	0	0	0
4	SequentialCyclic	0	0	0	0	0
5	CyclicAssignment	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	CoefficientPropagation	0	0.000002	0.000002	0	0.000
8	CLARA	0.000002	0.000024	0.000023	0.000005	0.000
9	NearestByDepot	0.000014	0.000126	0.000119	0.000026	0.000
10	BestNearest	0.061819	0.399805	0.47017	0.102804	0.154
11	NearestByCustomer	0.095135	0.503309	0.54275	0.143155	0.219
12	Parallel	0.095135	0.503309	0.54275	0.143155	0.219
13	UPGMC	0.277427	0.803027	0.662042	0.346177	0.450
14	Sweep	0.347003	0.818179	0.662042	0.403996	0.506
15	Simplified	0.382014	0.818179	0.662042	0.420426	0.530
16	KMEANS	0.450259	0.818179	0.662042	0.470436	0.571
17	Farthest-First	0.662042	0.818179	0.662042	0.662042	0.662

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