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): 337.21614.
P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 17 and 408 degrees of freedom): 92.194481.
P-value computed by Iman and Daveport Test: -0.

Algorithm	Ranking
BestCyclicAssignment	13.16
BestNearest	6.86
CLARA	13.2
CoefficientPropagation	12.32
CyclicAssignment	14.48
Farthest-First	4.9
KMEANS	5.78
NearestByCustomer	6.68
NearestByDepot	10.64
PAM	1.04
Parallel	6.68
RandomByElement	18
RandomSequentialCyclic	16.04
SequentialCyclic	15.48
Simplified	5.76
Sweep	6.02
ThreeCriteriaClustering	5.52
UPGMC	8.44

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	0.052075
16	RandomSequentialCyclic	9.933993	0	0.003125	0.003201	0.003288	0.006016	0.052075
15	SequentialCyclic	9.563124	0	0.003333	0.003414	0.003507	0.009011	0.052075
14	CyclicAssignment	8.900857	0	0.003571	0.003657	0.003757	0.011996	0.052075
13	CLARA	8.053157	0	0.003846	0.003938	0.004046	0.014973	0.052075
12	BestCyclicAssignment	8.026666	0	0.004167	0.004265	0.004383	0.017941	0.052075
11	CoefficientPropagation	7.470362	0	0.004545	0.004652	0.004782	0.020899	0.052075
10	NearestByDepot	6.357755	0	0.005	0.005116	0.00526	0.023849	0.052075
9	UPGMC	4.90077	0.000001	0.005556	0.005683	0.005844	0.02679	0.052075
8	BestNearest	3.854389	0.000116	0.00625	0.006391	0.006574	0.029722	0.052075
7	NearestByCustomer	3.735181	0.000188	0.007143	0.007301	0.007513	0.032645	0.052075
6	Parallel	3.735181	0.000188	0.008333	0.008512	0.008764	0.035559	0.052075
5	Sweep	3.298086	0.000973	0.01	0.010206	0.010515	0.038465	0.052075
4	KMEANS	3.139142	0.001694	0.0125	0.012741	0.013109	0.041362	0.052075
3	Simplified	3.125896	0.001773	0.016667	0.016952	0.016667	0.04425	0.052075
2	ThreeCriteriaClustering	2.966952	0.003008	0.025	0.025321	0.025	0.047129	0.052075
1	Farthest-First	2.556347	0.010578	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	CLARA	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	UPGMC	0.000001	0.000016	0.000009	0.000009	0.000009
10	BestNearest	0.000116	0.001972	0.000928	0.000928	0.000696
11	NearestByCustomer	0.000188	0.003189	0.001313	0.001125	0.001125
12	Parallel	0.000188	0.003189	0.001313	0.001125	0.001125
13	Sweep	0.000973	0.016549	0.004867	0.004867	0.003545
14	KMEANS	0.001694	0.028805	0.006778	0.005318	0.004512
15	Simplified	0.001773	0.030135	0.006778	0.005318	0.004512
16	ThreeCriteriaClustering	0.003008	0.05113	0.006778	0.006015	0.006015
17	Farthest-First	0.010578	0.179822	0.010578	0.010578	0.010578

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	CLARA	0	0	0	0	0
6	BestCyclicAssignment	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	UPGMC	0.000001	0.000009	0.000008	0.000002	0.000
10	BestNearest	0.000116	0.000928	0.000882	0.000197	0.000
11	NearestByCustomer	0.000188	0.001312	0.00107	0.00029	0.000
12	Parallel	0.000188	0.001312	0.00107	0.00029	0.000
13	Sweep	0.000973	0.004858	0.004629	0.001273	0.000
14	KMEANS	0.001694	0.006761	0.005318	0.002057	0.001
15	Simplified	0.001773	0.006761	0.005318	0.002057	0.001
16	ThreeCriteriaClustering	0.003008	0.006761	0.006015	0.003195	0.003
17	Farthest-First	0.010578	0.010578	0.010578	0.010578	0.010

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