

Output tables for 1xN statistical comparisons.

June 12, 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 15 degrees of freedom): 488.76777.

P-value computed by Friedman Test: 0.

Iman and Davenport statistic (distributed according to F-distribution with 15 and 525 degrees of freedom): 333.908397.

P-value computed by Iman and Davenport Test: 0.

Algorithm	Ranking
BestCyclicAssignment	5.4444
BestNearest	4.1667
CLARA	15
CoefficientPropagation	9.9444
CyclicAssignment	4.1528
Farthest-First	13.8889
KMEANS	13
NearestByCustomer	3.7361
NearestByDepot	8.7917
PAM	16
Parallel	5.4861
RandomByElement	1.7639
Simplified	5.1528
Sweep	6.4444
ThreeCriteriaClustering	11.4167
UPGMC	11.6111

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
15	PAM	12.686265	0		0.003333		0.003414	0.003507	0.003414	0.048483
14	CLARA	11.795133	0		0.003571		0.003657	0.003757	0.006816	0.048483
13	Farthest-First	10.804985	0		0.003846		0.003938	0.004046	0.010206	0.048483
12	KMEANS	10.012867	0		0.004167		0.004265	0.004383	0.013585	0.048483
11	UPGMC	8.775183	0		0.004545		0.004652	0.004782	0.016952	0.048483
10	ThreeCriteriaClustering	8.601907	0		0.005		0.005116	0.00526	0.020308	0.048483
9	CoefficientPropagation	7.289961	0		0.005556		0.005683	0.005844	0.023653	0.048483
8	NearestByDepot	6.262683	0		0.00625		0.006391	0.006574	0.026986	0.048483
7	Sweep	4.170997	0.00003		0.007143		0.007301	0.007513	0.030307	0.048483
6	Parallel	3.316994	0.00091		0.008333		0.008512	0.008764	0.033617	0.048483
5	BestCyclicAssignment	3.279864	0.001039		0.01		0.010206	0.010515	0.036916	0.048483
4	Simplified	3.01995	0.002528		0.0125		0.012741	0.013109	0.040204	0.048483
3	BestNearest	2.141194	0.032258		0.016667		0.016952	0.016667	0.043481	0.048483
2	CyclicAssignment	2.128817	0.033269		0.025		0.025321	0.025	0.046746	0.048483
1	NearestByCustomer	1.757512	0.078831		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 ≤ 0.003333 .
Holm's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.016667 .
Hochberg's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.0125 .
Hommel's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.025 .
Holland's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.016952 .
Rom's procedure rejects those hypotheses that have an unadjusted p-value ≤ 0.013109 .
Finner'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 ≤ 0.048483 .

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_{Halm}	$p_{Hochberg}$	p_{Hommel}
1	PAM	0	0	0	0	0
2	CLARA	0	0	0	0	0
3	Farthest-First	0	0	0	0	0
4	KMEANS	0	0	0	0	0
5	UPGMC	0	0	0	0	0
6	ThreeCriteriaClustering	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	Sweep	0.00003	0.000455	0.000212	0.000212	0.000212
10	Parallel	0.00091	0.013649	0.005459	0.005193	0.00455
11	BestCyclicAssignment	0.001039	0.015579	0.005459	0.005193	0.005193
12	Simplified	0.002528	0.037922	0.010113	0.010113	0.010113
13	BestNearest	0.032258	0.483876	0.096775	0.066539	0.064517
14	CyclicAssignment	0.033269	0.499041	0.096775	0.066539	0.066539
15	NearestByCustomer	0.078831	1.182459	0.096775	0.078831	0.078831

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

i	algorithm	unadjusted p	$p_{Holland}$	p_{Rom}	p_{Finner}	p_{Li}
1	PAM	0	0	0	0	0
2	CLARA	0	0	0	0	0
3	Farthest-First	0	0	0	0	0
4	KMEANS	0	0	0	0	0
5	UPGMC	0	0	0	0	0
6	ThreeCriteriaClustering	0	0	0	0	0
7	CoefficientPropagation	0	0	0	0	0
8	NearestByDepot	0	0	0	0	0
9	Sweep	0.00003	0.000212	0.000202	0.000051	0.0000
10	Parallel	0.00091	0.005447	0.004938	0.001365	0.0009
11	BestCyclicAssignment	0.001039	0.005447	0.004938	0.001416	0.0011
12	Simplified	0.002528	0.010074	0.009643	0.003159	0.0027
13	BestNearest	0.032258	0.093687	0.066539	0.037128	0.0338
14	CyclicAssignment	0.033269	0.093687	0.066539	0.037128	0.0348
15	NearestByCustomer	0.078831	0.093687	0.078831	0.078831	0.0788

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