k-median

cost

	Cplex	Lloyd	DP
dataAlea2_50_ex1	2058.093	1773.838	1704.62
dataAlea2_50_ex2	2021.817	2117.542	1954.52
dataAlea2_50_ex3	3096.82	2403.684	2351.41
dataAlea2_100_ex1	5824.758	6446.903	5718.7
dataAlea2_100_ex2	3003.123	2442.001	2377.62
dataAlea2_100_ex3	6972.896	6642.886	6515.32
dataAlea2_500_ex1	15131.000	17382.402	
dataAlea2_500_ex2	26712.050	30616.412	
dataAlea2_500_ex3	20900.870	24173.468	
.dataAlea2_800_ex1	48409.97	49581.405	
dataAlea2_800_ex2	43972.41	47279.519	
dataAlea2_800_ex3	15418.06	16067.962	
dataAlea2_1000_ex1	54125.86	55055.569	
dataAlea2_1000_ex2	32636.25	42775.379	
dataAlea2_1000_ex3	35194.71	42275.361	

time

	Cplex	Lloyd	DP
dataAlea2_50_ex1	0.05s	0.00151s	1.591s
dataAlea2_50_ex2	0.05s	0.000914s	1.872s
dataAlea2_50_ex3	0.05s	0.00278	2.427s
dataAlea2_100_ex1	0,25 sec	0.00406	8.334 Sec
dataAlea2_100_ex2	0.24 sec	0.00187	8.028 Sec
dataAlea2_100_ex3	0,26 sec	0.00360	7.886 Sec
dataAlea2_500_ex1	49,76 sec	0.0451	
dataAlea2_500_ex2	72,64 sec.	0.0250	
dataAlea2_500_ex3	59,90 sec	0.0252	
dataAlea2_800_ex1	397,11 sec.	0.0603	
dataAlea2_800_ex2	381,77 sec	0.0484	
dataAlea2_800_ex3	357,58 sec	0.0232	
dataAlea2_1000_ex1	764,97 sec	0.0648	
dataAlea2_1000_ex2	392,97 sec	0.0723	
dataAlea2_1000_ex3	770,65 sec	0.0416	

cost

	Cplex	Lloyd	DP
dataConvex_3_10_2_10_ex1	1.225714	1.2257136	1.22571
dataConvex_3_10_2_10_ex2	2.026535	2.0265349	1.98655
dataConvex_3_10_2_10_ex3	3.219636	3.0694910	3.07206
dataConvex_3_10_2_10_ex4	3.06849	2.92485976	2.31282
dataConvex_3_10_2_50_ex1	24.53523	22.3258710	21.4712
dataConvex_3_10_2_50_ex2	22.48331	22.1634272	19.4666
dataConvex_3_10_2_50_ex3	20.54524	17.5826658	17.5209
dataConvex_3_10_2_50_ex4	20.62211	17.6912253	17.5610
dataConvex_3_10_2_100_ex1	43.99194	41.2834802	40.9474
dataConvex_3_10_2_100_ex2	44.44086	42.9955266	41.3502
dataConvex_3_10_2_100_ex3	43.21486	41.1860666	40.1709
dataConvex_3_10_2_100_ex4	43.58614	42.1334181	40.4968
dataConvex_3_10_2_500_ex1	220.7355	218.840070	
dataConvex_3_10_2_500_ex2.	213.1041	210.7200536	
dataConvex_3_10_2_500_ex3.	214.3776	212.4064234	
dataConvex_3_10_2_500_ex4	215.9493	213.3439748	

time

	Cplex	Lloyd	DP
dataConvex_3_10_2_10_ex1	0,01 sec	0.000843	2.634 Sec
dataConvex_3_10_2_10_ex2	0.01 sec	0.000864	1.709 Sec
dataConvex_3_10_2_10_ex3	0.01 sec	0.001361	1.011 Sec
dataConvex_3_10_2_10_ex4	0.01 sec	0.000658	1.48 Sec
dataConvex_3_10_2_50_ex1	0,05 sec	0.003533	1.542 Sec
dataConvex_3_10_2_50_ex2	0.06 sec	0.002842	1.325 Sec
dataConvex_3_10_2_50_ex3	0,05 sec	0.003246	1.151 Sec
dataConvex_3_10_2_50_ex4	0,05 sec	0.003505	1.973 Sec
dataConvex_3_10_2_100_ex1	0,28 sec	0.013531	8.027 Sec
dataConvex_3_10_2_100_ex2	0,29 sec	0.005231	8.396 Sec
dataConvex_3_10_2_100_ex3	0,31 sec.	0.014229	7.668 Sec
dataConvex_3_10_2_100_ex4	0,31 sec	0.007851	8.033 Sec
dataConvex_3_10_2_500_ex1	98,74 sec	0.054555	
dataConvex_3_10_2_500_ex2.	92,00 sec	0.084102	
dataConvex_3_10_2_500_ex3.	125,59 sec	0.323036	
dataConvex_3_10_2_500_ex4	119,21 sec	0.067142	

Cost –quality

	Cplex-q （%)	Lloyd-q(%)	DP-q(%)
dataAlea2_50_ex1	20.7361758	4.06061175	0
dataAlea2_50_ex2	3.443147167	8.34076909	0
dataAlea2_50_ex3	31.70055414	2.22309168	0

dataAlea2_100_ex1	1.854582335	12.7337157	0
dataAlea2_100_ex2	26.3079466	2.70779183	0
dataAlea2_100_ex3	7.023077915	1.95793913	0
dataConvex_3_10_2_10_ex1	0.000326341	0.00029371	0
dataConvex_3_10_2_10_ex2	2.012785986	2.01278095	0
dataConvex_3_10_2_10_ex3	4.891527618	0	0
dataConvex_3_10_2_10_ex4	32.67310037	26.4629223	0
dataConvex_3_10_2_50_ex1	14.27041805	3.98054603	0
dataConvex_3_10_2_50_ex2	15.49685102	13.8536118	0
dataConvex_3_10_2_50_ex3	17.2613279	0.35252641	0
dataConvex_3_10_2_50_ex4	17.43129662	0.74155971	0
dataConvex_3_10_2_100_ex1	7.435246194	0.82076078	0
dataConvex_3_10_2_100_ex2	7.474353207	3.97900518	0
dataConvex_3_10_2_100_ex3	7.577525024	2.52711938	0
dataConvex_3_10_2_100_ex4	7.628602754	4.04135166	0

N	Cplex	Lloyd	DP
10	0.01	0.0008	1.5
50	0.05	0.0035	1.5
100	0.3	0.01	8
500	100	0.03	
800	370	0.06	
1000	750	0.07	

kmdoids

	Cplex	Lloyd	DP
dataAlea2_50_ex1	233207.2	265975.0147	265975
dataAlea2_50_ex2	270378.0	270215.5484	256317
dataAlea2_50_ex3	187504.5	199292.1990	199292
dataAlea2_100_ex1	894084.8	850628.3129	850628
dataAlea2_100_ex2	553763.9	166976.2016	166976
dataAlea2_100_ex3	1051562	757190.92736	757191
dataConvex_3_10_2_10_ex1	0.378898	0.641745682	0.378898
dataConvex_3_10_2_10_ex2	0.9331854	0.883482452	0.905099
dataConvex_3_10_2_10_ex3	2.167675	2.031436880	2.11595
dataConvex_3_10_2_10_ex4	1.899827	1.398858661	1.39886
dataConvex_3_10_2_50_ex1	23.65862	18.61567128	13.0637
dataConvex_3_10_2_50_ex2	19.29901	12.862915178	12.86291

dataConvex_3_10_2_50_ex3	15.41585	11.181713638	9.6588
dataConvex_3_10_2_50_ex4	19.65059	16.797720125	9.66223
dataConvex_3_10_2_100_ex1	37.55434	30.440187290	23.2781
dataConvex_3_10_2_100_ex2	37.1074	24.330926521	24.3309
dataConvex_3_10_2_100_ex3	35.16401	28.057913375	23.0744
dataConvex_3_10_2_100_ex4	36.5449	25.533839482	23.5052

k-medoids	Cplex	Lloyd	DP	min	Cplex-q	Lloyd-q	DP-q
dataAlea2_50_ex1	233207.2	265975.0147	265975	233207.2	0	14.0509447	14.05094
dataAlea2_50_ex2	270378	270215.5484	256317	256317	5.48578518	5.42240601	0
dataAlea2_50_ex3	187504.5	199292.199	199292	187504.5	0	6.28662192	6.286516
dataAlea2_100_ex1	894084.8	850628.3129	850628	850628	5.108790211	3.6785E-05	0
dataAlea2_100_ex2	553763.9	166976.2016	166976	166976	231.6428109	0.00012074	0
dataAlea2_100_ex3	1051562	757190.9274	757191	757190.9	38.87673003	0	0
dataConvex_3_10_2_10_ex1	0.378898	0.641745682	0.378898	0.378898	0	69.3716203	0
dataConvex_3_10_2_10_ex2	0.9331854	0.883482452	0.905099	0.883482	5.625799119	0	2.446743
dataConvex_3_10_2_10_ex3	2.167675	2.03143688	2.11595	2.031437	6.706490433	0	4.160263
dataConvex_3_10_2_10_ex4	1.899827	1.398858661	1.39886	1.398859	35.81264877	0	0
dataConvex_3_10_2_50_ex1	23.65862	18.61567128	13.06637	13.06637	81.10198489	42.4992252	0
dataConvex_3_10_2_50_ex2	19.29901	12.86291518	12.86291	12.86291	50.03611158	4.0255E-05	0
dataConvex_3_10_2_50_ex3	15.41585	11.18171364	9.6588	9.6588	59.60419514	15.7671102	0
dataConvex_3_10_2_50_ex4	19.65059	16.79772013	9.66223	9.66223	103.3753078	73.8493094	0
dataConvex_3_10_2_100_ex1	37.55434	30.44018729	23.2781	23.2781	61.32906036	30.7674909	0
dataConvex_3_10_2_100_ex2	37.1074	24.33092652	24.3309	24.3309	52.51141553	0.000109	0
dataConvex_3_10_	35.16401	28.0579	23.07	23.07	52.3940	21.597	0

2_100_ex3		1338	44	44	3841	586	
dataConvex_3_10_2_100_ex4	36.5449	25.53383948	23.5052	23.5052	55.47580961	8.63059868	0

Quality

k-medoids	Cplex-q	Lloyd-q	DP-q
dataAlea2_50_ex1	0	14.0509447	14.05094
dataAlea2_50_ex2	5.48578518	5.42240601	0
dataAlea2_50_ex3	0	6.28662192	6.286516
dataAlea2_100_ex1	5.108790211	3.6785E-05	0
dataAlea2_100_ex2	231.6428109	0.00012074	0
dataAlea2_100_ex3	38.87673003	0	0
dataConvex_3_10_2_10_ex1	0	69.3716203	0
dataConvex_3_10_2_10_ex2	5.625799119	0	2.446743
dataConvex_3_10_2_10_ex3	6.706490433	0	4.160263
dataConvex_3_10_2_10_ex4	35.81264877	0	0
dataConvex_3_10_2_50_ex1	81.10198489	42.4992252	0
dataConvex_3_10_2_50_ex2	50.03611158	4.0255E-05	0
dataConvex_3_10_2_50_ex3	59.60419514	15.7671102	0
dataConvex_3_10_2_50_ex4	103.3753078	73.8493094	0
dataConvex_3_10_2_100_ex1	61.32906036	30.7674909	0
dataConvex_3_10_2_100_ex2	52.51141553	0.000109	0
dataConvex_3_10_2_100_ex3	52.39403841	21.597586	0
dataConvex_3_10_2_100_ex4	55.47580961	8.63059868	0

time

	Cplex	Lloyd	DP
dataAlea2_50_ex1	0,06 sec	0.0065549	1.705 Sec
dataAlea2_50_ex2	0,05 sec	0.0019379	1.66 Sec
dataAlea2_50_ex3	0,05 sec	0.0039140	1.705 Sec
dataAlea2_100_ex1	0,25 sec	0.0104080	14.751 Sec
dataAlea2_100_ex2	0,25 sec	0.0057090	14.89 Sec
dataAlea2_100_ex3	0,23 sec	0.0039949	15.353 Sec
dataConvex_3_10_2_10_ex1	0,01 sec	0.0005862	1.436
dataConvex_3_10_2_10_ex2	0.00	0.00056568	1.532
dataConvex_3_10_2_10_ex3	0.00	0.00067345	1.717
dataConvex_3_10_2_10_ex4	0.01	0.00179101	1.357
dataConvex_3_10_2_50_ex1	0.06	0.00205786	3.604
dataConvex_3_10_2_50_ex2	0.05	0.00492340	2.393
dataConvex_3_10_2_50_ex3	0.06	0.00333372	2.284

dataConvex_3_10_2_50_ex4	0.06	0.00245183	2.135
dataConvex_3_10_2_100_ex1	0.30	0.00779526	17.336
dataConvex_3_10_2_100_ex2	0.29	0.01447455	18.334
dataConvex_3_10_2_100_ex3	0.29	0.0095183809	17.811
dataConvex_3_10_2_100_ex4	0.29	0.0065462550	19.56

N	Cplex	Lloyd	DP
10	0.01	0.0006	1.7
50	0.06	0.004	2.5
100	0.3	0.009	16

discrete k-center

	cplex	DP
dataAlea2_50_ex1	436.3841	421.085
dataAlea2_50_ex2	440.925	378.452
dataAlea2_50_ex3	463.8659	416.044
dataAlea2_100_ex1	493.4239	451.817
dataAlea2_100_ex2	477.7782	323.907
dataAlea2_100_ex3	594.3583	456.476

	Cplex	DP
dataAlea2_50_ex1	1,03 sec	1.331 Sec
dataAlea2_50_ex2	1,75 sec	1.769 Sec
dataAlea2_50_ex3	2,49 sec	1.767 Sec
dataAlea2_100_ex1	238,95 sec	2.03 Sec
dataAlea2_100_ex2	19,84 sec	1.576 Sec
dataAlea2_100_ex3	170,62 sec	1.419 Sec

continuous k-center

cost

	Cplex	Cplex-Pareto	DP
dataAlea2_50_ex1	408.3283	398.0015	421.085
dataAlea2_50_ex2	378.4519	185.7544	378.452

dataAlea2_50_ex3	431.0037	416.729	416.044
dataAlea2_100_ex1	296,6047	164.3702	451.817
dataAlea2_100_ex2	400.5863	323.472	323.907
dataAlea2_100_ex3	499,9950	498.4939	456.476
dataConvex_3_10_2_10_ex1	0.5907992	0.5907992	0.590799
dataConvex_3_10_2_10_ex2	0.9944741	0.9944741	0.993272
dataConvex_3_10_2_10_ex3	1.334924	1.334924	1.53602
dataConvex_3_10_2_10_ex4	1.255716	1.255716	1.15641
dataConvex_3_10_2_50_ex1	2.929918	1.569714	2.77596
dataConvex_3_10_2_50_ex2	2.861603	1.540522	2.60684
dataConvex_3_10_2_50_ex3	2.526753	1.699532	2.52675
dataConvex_3_10_2_50_ex4	2.74341	1.594426	2.74324

Quality

	Cplex	Cplex-Pareto	DP
dataAlea2_50_ex1	2.594663588	0	5.799853
dataAlea2_50_ex2	103.7377849	0	103.7378
dataAlea2_50_ex3	3.595701416	0.16464605	0
dataAlea2_100_ex1	1804391.933	0	174.8777
dataAlea2_100_ex2	23.83955953	0	0.134478
dataAlea2_100_ex3	1095236.885	9.20484319	0
dataConvex_3_10_2_10_ex1	3.38525E-05	3.3852E-05	0
dataConvex_3_10_2_10_ex2	0.121024251	0.12102425	0
dataConvex_3_10_2_10_ex3	0	0	15.06423
dataConvex_3_10_2_10_ex4	8.587438711	8.58743871	0
dataConvex_3_10_2_50_ex1	86.65298265	0	76.84495
dataConvex_3_10_2_50_ex2	85.75541278	0	69.21797
dataConvex_3_10_2_50_ex3	48.67345834	0	48.67328
dataConvex_3_10_2_50_ex4	72.0625479	0	72.05189

Time

	Cplex	Cplex-Pareto	DP
dataAlea2_50_ex1	3,49 sec.	0,09 sec	1.107 Sec
dataAlea2_50_ex2	3,79 sec	0,06 sec	1.484 Sec
dataAlea2_50_ex3	4,30 sec	0,09 sec	1.1 Sec
dataAlea2_100_ex1	449,72 sec	0,68 sec	1.843 Sec
dataAlea2_100_ex2	143,78 sec	0,64 sec	1.308 Sec
dataAlea2_100_ex3	724,63 sec	0,84 sec	2.013 Sec