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Online Supplement to “Disjunctive Programming for Multiobjective Discrete Optimisation”

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Detailed computational results for the MOAP, MOKP and MOTSP instances

Table 1 Results for MOAP instances with $|K| = 3$ and $n = 10$

Instance number	Time (s)	Disjunctive Programming		
		No. Sol.	No. Disj.	Time (s)
1	5.98	161	232	6.52
2	10.44	236	354	11.21
3	15.04	316	459	15.15
4	4.17	125	207	5.81
5	4.2	138	207	5.96
6	11.79	223	360	12.08
7	7.47	180	273	8.37
8	1.81	65	98	2.49
9	6.98	169	254	7.31
10	6.48	155	241	6.9

Table 2 Results for MOAP instances with $|K| = 3$ and $n = 15$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	98.69	878	1296	82.38	
2	44.8	473	694	32.2	
3	37.39	487	680	32.07	
4	44.74	521	757	36.76	
5	45.51	587	814	40.01	
6	34.73	395	609	25.42	
7	119.96	1109	1561	118.58	
8	54.78	594	862	44.61	
9	89.34	875	1228	78.31	
10	74.5	830	1175	69.57	

Table 3 Results for MOAP instances with $|K| = 4$ and $n = 5$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	1.15	47	183	2.36	
2	0.22	29	103	1.05	
3	0.37	32	96	1.32	
4	1.11	54	207	2.63	
5	0.72	47	166	2.36	
6	0.27	22	91	1.11	
7	0.1	13	43	0.64	
8	0.71	40	168	2.02	
9	0.49	35	112	1.27	
10	0.13	21	68	0.9	

Table 4 Results for MOAP instances with $|K| = 4$ and $n = 10$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	42.26	321	1029	34.53	
2	172.95	857	2720	250.1	
3	169.03	796	2693	232.96	
4	332.97	1267	4075	773.83	
5	293.17	1192	3954	688.91	
6	304.86	1251	4160	764.39	
7	101.74	568	1840	102.85	
8	242.24	1128	3522	525.12	
9	150.94	707	2409	178.18	
10	189.29	865	2880	277.79	

Table 5 Results for MOKP instances with $|K| = 3$ and $n = 30$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	2.56	88	177	5.38	
2	7	196	393	16.12	
3	4.15	118	236	10.67	
4	1.49	63	126	3.27	
5	1.46	69	139	3.47	
6	3.04	103	207	6.41	
7	9.65	266	530	26.34	
8	2.99	98	196	6.95	
9	1.75	62	124	3.86	
10	2.94	95	191	5.83	

Table 6 Results for MOKP instances with $|K| = 3$ and $n = 40$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	27.36	486	964	86.68	
2	11.91	252	502	28.21	
3	32.86	541	1063	99.39	
4	12.22	256	510	36.75	
5	19.29	385	764	58.63	
6	10.45	222	443	30.44	
7	11.53	238	472	35.34	
8	5.92	136	272	13.33	
9	17.59	339	672	52.83	
10	11.39	259	516	32.85	

Table 7 Results for MOKP instances with $|K| = 3$ and $n = 50$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	34.65	507	995	101.01	
2	9.31	202	395	20.13	
3	32.08	530	1052	89.26	
4	20.4	402	791	66.59	
5	35.09	557	1103	110.9	
6	61.01	803	1567	193.63	
7	35.7	519	1026	107.48	
8	7.52	178	357	21.01	
9	21.37	361	713	62.72	
10	22.15	383	761	68.76	

Table 8 Results for MOKP instances with $|K| = 4$ and $n = 20$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	3.03	60	241	3.93	
2	14.1	143	632	12.15	
3	117.63	325	1745	67.78	
4	0.39	17	59	0.92	
5	4.55	74	333	5.74	
6	15.93	152	685	14.83	
7	22.37	175	869	25.16	
8	9.25	116	567	9.63	
9	4.56	77	338	6.22	
10	44.14	229	1124	32.49	

Table 9 Results for MOKP instances with $|K| = 4$ and $n = 30$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	864.75	563	2861	290.12	
2	603.42	535	2805	245.04	
3	45.12	226	1108	40.54	
4	536.59	517	2781	255.61	
5	75.91	281	1377	47.45	
6	22.07	191	833	26.85	
7	311.62	480	2362	204.78	
8	62	262	1263	58.47	
9	25.7	186	820	25.46	
10	1868.06	735	3678	488.73	

Table 10 Results for MOKP instances with $|K| = 4$ and $n = 40$

		Kirlik and Sayin (2014)	Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)	
1	1766.00	901	4516	906.28	
2	3600	1427	7949	3600	
3	352.52	508	2349	213.3	
4	3600	1248	6139	2139.9	
5	3600	1391	7945	3600	
6	3600	1357	7944	3600	
7	3600	1390	7769	3600	
8	1671.44	741	3981	640.96	
9	3600	1486	7683	3600	
10	552.02	555	2785	293.96	

Table 11 Results for MOKP instances with $|K| = 5$ and $n = 15$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	63.11	72	766	11.83
2	40.71	59	759	11.69
3	328.07	125	1226	27.53
4	29.83	65	551	8.48
5	6.91	47	341	4.44
6	1.36	20	171	1.93
7	7.13	47	431	5.37
8	2.95	30	249	3.24
9	0.75	16	97	1.13
10	107.65	96	920	15.53

Table 12 Results for MOKP instances with $|K| = 5$ and $n = 20$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	3600	220	2277	98.68
2	134.59	95	801	15.12
3	47.26	76	603	9.62
4	127.41	89	1007	18.04
5	456.34	110	1018	19.06
6	71.15	87	706	11.72
7	23.61	61	531	8.1
8	2796.22	211	2217	86.16
9	3600	237	3504	177.59
10	3600	426	5993	889.9

Table 13 Results for MOKP instances with $|K| = 5$ and $n = 25$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	3600	679	9958	3600
2	3600	687	5482	3600
3	3600	540	10690	3600
4	1624.33	172	1814	55.03
5	3600	309	3469	262.01
6	3600	612	8711	3600
7	3600	448	5568	920.71
8	272.78	103	933	17.78
9	3600	689	9607	3600
10	3600	452	5881	985.93

Table 14 Results for MOTSP instances with $|K| = 3$ and $n = 10$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	47.83	117	192	11.93
2	105.95	207	322	33.03
3	72.99	157	251	18.79
4	49.99	87	150	10.19
5	58.52	139	225	15.1
6	20.41	51	91	4.7
7	60.29	112	186	13.66
8	67.19	152	240	15.43
9	63.14	188	303	17.41
10	14.44	50	90	4.38

Table 15 Results for MOTSP instances with $|K| = 3$ and $n = 15$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	572.65	335	516	75.02
2	1123.4	584	880	178.87
3	1632.82	724	1044	203.02
4	1039.16	462	701	118.74
5	993.63	487	727	144.77
6	967.13	453	687	121.32
7	1079.35	675	968	193.53
8	1596.23	811	1120	237.44
9	1182.46	433	671	113.01
10	1438.11	708	1048	228.05

Table 16 Results for MOTSP instances with $|K| = 3$ and $n = 20$

		Kirlik and Sayin (2014) Disjunctive Programming		
Instance number	Time (s)	No. Sol.	No. Disj.	Time (s)
1	4964.52	1364	1936	902.33
2	4737.66	1487	2078	1186.88
3	3110.1	798	1123	520.34
4	4502.96	1656	2237	1381.76
5	5960.21	1811	2517	1330.76
6	3688.11	909	1305	592.17
7	3641.5	1250	1736	821.93
8	3158.06	1121	1595	680.27
9	3777.01	1517	2070	924.59
10	3718.82	1013	1454	660.93