Online Supplement to: Uncommon Dantzig-Wolfe Reformulation for the Temporal Knapsack Problem

Alberto Caprara, Fabio Furini, Enrico Malaguti

Department of Electronics, Computer Sciences and Systems,
University of Bologna,
40136 Bologna, Italy,
e-mails: {fabio.furini,enrico.malaguti}@unibo.it

1 Detailed instance features

In the following two Tables (1,2), we report some additional information on the instances described in the papers. In detail, for each instance we report the name, the number of constraints (row) and the number of variables (var). Then we report the value of the continuous relaxation (lp), the optimal value (opt^*) and the bound ($bound^*$) computed by the best algorithm presented in the paper. In case the optimal value and the bound do not coincide, the instance is not solved to optimality.

Table 1: First Class Instance Features.

name	row	var	lp	opt*	bound*	name	row	var	lp	opt*	bound*
I1	2688	2697	73230.21	62524	62524.00	I51	768	4948	81409.36	71998	71998.00
I2	2816	2825	76852.15	65046	65046.00	I52	896	5769	93495.19	81898	81898.00
I3	2944	2953	79598.69	67558	67558.00	I53	1024	6721	110137.25	97056	97056.00
I4	3072	3081	82467.66	70316	70316.00	I54	1152	7382	121747.65	107491	107491.00
I5	3200	3209	89923.52	76634	76634.00	I55	1280	8266	137308.63	120505	120505.00
I6	3328	3337	90672.21	77204	77204.00	I56	1408	9002	146998.74	129053	129053.00
I7	3456	3465	95919.27	81690	81690.00	I57	1536	9865	162489.16	142486	142486.00
I8	3584	3593	99262.82	84581	84581.00	I58	1664	10661	172075.23	151489	151489.00
I9	3712	3721	102724.65	87297	87297.00	I59	1792	11448	188109.13	165075	165097.00
I10	3840	3849	103892.85	88889	88889.00	I60	1920	12498	206427.59	182813	182813.00
I11	2688	4480	103802.28	88574	88574.00	I61	768	2071	24633.00	22044	22044.00
I12	2816	4749	112119.39	96366	96366.00	I62	896	2422	29081.00	26115	26115.00
I13	2944	4887	114630.26	97987	97987.00	I63	1024	2763	32215.00	29110	29110.00
I14	3072	5153	120447.69	103747	103747.00	I64	1152	3103	36243.00	32692	32692.00
I15	3200	5298	121641.43	103498	103498.00	I65	1280	3434	41155.00	37016	37016.00
I16	3328	5547	127386.90	108686	108686.00	I66	1408	3774	44071.00	39593	39593.00
I17	3456	5745	129721.92	112017	112017.00	I67	1536	4164	49400.00	44735	44735.00
I18	3584	5929	136534.29	116631	116631.00	I68	1664	4488	53344.00	48182	48182.00
I19	3712	6208	146245.82	125346	125346.00	I69	1792	4786	55799.00	50559	50559.00
I20	3840	6462	149534.57	128454	128454.00	I70	1920	5142	61016.00	54842	54842.00
I21	2688	4972	101348.05	87259	87259.00	I71	768	2916	46214.28	40982	40982.00
I22	2816	5161	104093.66	89548	89548.00	I72	896	3424	54264.62	47914	47914.00
I23	2944	5423	112511.36	96418	96418.00	I73	1024	3832	59692.33	52447	52447.00
I24	3072	5658	114270.26	98019	98019.00	I74	1152	4316	67701.80	59790	59790.00
I25	3200	5875	120846.51	104227	104227.00	I75	1280	4771	75300.45	66179	66179.00
I26	3328	6112	125679.74	107704	107704.00	I76	1408	5403	84719.96	75070	75070.00
I27	3456	6380	127368.59	109805	109805.00	I77	1536	5793	92447.25	81982	81982.00
I28	3584	6582	135650.71	116248	116248.00	I78	1664	6167	96766.53	85314	85314.00
I29	3712	6817	139600.57	119729	119729.00	I79	1792	6800	107506.65	95037	95037.00
I30	3840	7026	143834.45	123463	123463.00	I80	1920	7241	113069.40	100031	100031.00
I31	2688	6322	118147.88	102424	102424.00	I81	768	5210	80878.14	71426	71426.00
I32	2816	6546	120360.79	103159	103159.00	I82	896	6057	93438.94	82942	82942.00
I33	2944	6895	129601.72	111884	111884.00	I83	1024	6901	107806.34	96115	96115.00
I34	3072	7209	135934.57	117903	117903.00	I84	1152	7737	122734.53	110102	110102.00
I35	3200	7484	139207.04	120668	120668.00	I85	1280	8656	134801.82	119233	119233.00
I36	3328	7784	143078.51	123739	123739.00	I86	1408	9370	144003.97	128178	128178.00
I37	3456	8089	149990.22	130308	130308.00	I87	1536	10271	159046.15	142056	142056.00
I38	3584	8425	154962.59	133092	133092.00	I88	1664	11057	173756.92	154745	154770.00
I39	3712	8650	160788.47	138613	138613.00	I89	1792	11992	188147.70	167916	167916.00
I40	3840	8977	167495.03	144612	144612.00	I90	1920	13025	199612.81	176876	176916.00
I41	768	2071	35900.76	30866	30866.00	I91	768	3117	48477.88	42685	42685.00
I42	896	2422	41410.50	35771	35771.00	I92	896	3594	52366.41	46526	46526.00
I43	1024	2756	47323.86	40934	40934.00	I93	1024	4176	61537.48	54437	54437.00
I44	1152	3104	53126.97	46180	46180.00	I94	1152	4671	69087.68	60719	60719.00
I45	1280	3433	58235.01	50324	50324.00	I95	1280	5209	76853.31	68432	68432.00
I46	1408	3789	64249.15	55495	55495.00	I96	1408	5628	81652.19	72337	72346.00
I47	1536	4154	68933.49	59255	59255.00	I97	1536	6215	90864.53	80122	80122.00
I48	1664	4476	75464.66	65465	65465.00	I98	1664	6730	100490.40	88460	88460.00
I49	1792	4797	80288.60	69530	69530.00	I99	1792	7172	105321.35	92380	92380.00
I50	1920	5129	87439.72	75756	75756.00	I100	1920	7709	114205.89	100915	100915.00

Table 2: Second Class Instance Features.

name	row	var	lp	opt*	bound*	name	row	var	lp	opt*	bound*
U1	459	1000	50030.04	49797	49797.00	U51	445	1000	35329.47	34771	34774.00
U2	468	1000	49599.06	49490	49490.00	U52	467	1000	34412.77	33827	33838.75
U3	485	1000	49295.61	49020	49020.00	U53	464	1000	33787.34	33197	33216.00
U4	484	1000	49134.97	48972	48972.00	U54	443	1000	33549.08	32942	32955.33
U5	474	1000	50311.73	50149	50149.00	U55	456	1000	33949.75	33318	33325.88
U6	465	1000	49649.53	49466	49466.00	U56	457	1000	34120.88	33424	33465.54
U7	487	1000	50984.65	50666	50666.00	U57	437	1000	33971.65	33438	33440.50
U8	474	1000	50022.45	49859	49859.00	U58	435	1000	32683.93	32059	32113.75
U9	473	1000	50614.47	50358	50358.00	U59	464	1000	34452.02	33881	33887.50
U10	468	1000	50078.58	49961	49961.00	U60	447	1000	33566.19	32973	33010.36
U11	452	1000	46819.17	46266	46266.00	U61	433	1000	32004.41	31464	31496.89
U12	466	1000	46321.00	45628	45628.00	U62	460	1000	30905.62	30330	30335.20
U13	467	1000	46056.57	45531	45531.00	U63	439	1000	31239.41	30704	30723.65
U14	461	1000	45808.75	45218	45218.00	U64	453	1000	31876.25	31315	31353.36
U15	470	1000	46629.84	45978	45978.00	U65	448	1000	31733.75	31177	31186.00
U16	465	1000	46546.72	45795	45795.00	U66	477	1000	31608.03	31059	31067.50
U17	477	1000	47161.15	46471	46471.00	U67	444	1000	32401.24	31761	31834.68
U18	466	1000	46534.87	45877	45877.00	U68	448	1000	30933.08	30445	30459.71
U19	467	1000	47047.86	46356	46356.00	U69	473	1000	32663.75	32038	32066.45
U20	461	1000	46880.86	46217	46217.00	U70	439	1000	32135.82	31650	31705.00
U21	445	1000	42738.79	41946	41946.00	U71	439	1000	30916.17	30320	30487.62
U22	478	1000	42008.41	41346	41346.00	U72	456	1000	30915.38	30338	30495.40
U23	476	1000	41389.29	40694	40694.00	U73	444	1000	30457.51	29963	30051.37
U24	471	1000	41720.49	40955	40955.00	U74	438	1000	30088.56	29544	29626.54
U25	454	1000	41979.16	41235	41235.00	U75	465	1000	30346.40	29835	29973.79
U26	449	1000	41948.49	41168	41168.00	U76	439	1000	30741.84	30156	30319.61
U27	456	1000	42873.33	42054	42054.00	U77	431	1000	30319.63	29790	29928.42
U28	462	1000	42123.14	41475	41475.00	U78	456	1000	29930.41	29380	29479.91
U29	477	1000	43109.19	42277	42277.00	U79	453	1000	30179.69	29666	29790.09
U30	457	1000	42389.84	41684	41684.00	U80	437	1000	30341.32	29784	29935.58
U31	446	1000	39410.92	38685	38685.00	U81	409	1000	29969.06	29451	29586.24
U32	470	1000	38726.94	38106	38106.00	U82	451	1000	28709.27	28207	28307.75
U33	463	1000	38702.67	38067	38067.00	U83	452	1000	28299.20	27855	27979.38
U34	449	1000	37881.00	37159	37159.00	U84	447	1000	29947.00	29472	29560.59
U35	454	1000	38548.77	37826	37826.00	U85	441	1000	28811.23	28335	28453.58
U36	455	1000	38278.68	37488	37491.33	U86	451	1000	29104.73	28564	28699.96
U37	444	1000	39010.70	38237	38236.75	U87	452	1000	29090.14	28584	28718.29
U38	445	1000	38083.02	37372	37372.00	U88	452	1000	28961.51	28445	28562.54
U39	472	1000	39135.98	38374	38384.00	U89	437	1000	29495.70	29042	29144.33
U40	442	1000	38641.71	37965	37965.00	U90	430	1000	28415.19	27916	28061.62
U41	439	1000	36201.11	35538	35538.00	U91	441	1000	28209.62	27727	27872.82
U42	475	1000	35566.34	34934	34944.50	U92	467	1000	27122.92	26630	26771.13
U43	476	1000	35717.20	35071	35071.00	U93	450	1000	28277.61	27817	27916.20
U44	452	1000	36234.23	35596	35596.00	U94	449	1000	27700.70	27316	27387.50
U45	469	1000	35755.45	35112	35113.00	U95	462	1000	27596.56	27126	27251.84
U46	456	1000	35215.91	34529	34533.54	U96	446	1000	27980.33	27485	27623.50
U47	478	1000	36510.13	35866	35868.50	U97	475	1000	27484.81	27006	27111.65
U48	465	1000	35197.25	34564	34564.00	U98	462	1000	27371.23	26904	27000.10
U49	436	1000	36499.11	35883	35883.00	U99	444	1000	29277.14	28759	28877.14
U50	454	1000	35886.20	35311	35322.20	U100	438	1000	27714.50	27297	27385.89