

# Supplementary material of “*GRASP* approaches for the Weighted Safe Set Problem”

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The following tables report the detailed results obtained by the *RCL*-based *GRASP* metaheuristic with  $\mu = 0.3$  and  $t = 10$  seconds of run time described in the above mentioned paper on the benchmark instances available at <https://homes.di.unimi.it/cordone/research/wssp.html>.

The computational times reported refer to an Intel Xeon E5-2620 with a 2.1 GHz CPU and 16 GB of RAM with a time limit of one hour.

All tables have one row for each pair of instances (weighted and unweighted). The first three columns report the number of vertices  $|V|$ , the density and the index of the instance. The following two groups of two columns refer to the weighted and unweighted instances, and provide the value of the upper and lower bound. In 26 cases out of 240, the bounds coincide and a single value is reported merging the two columns.

			Weighted					Unweighted	
$n$	$\delta$	$i$	$UB$	$LB$	$n$	$\delta$	$i$	$UB$	$LB$
50	1	1	73		50	1	1	15	
50	1	2	79		50	1	2	16	14
50	1	3	59		50	1	3	15	
50	1	4	87		50	1	4	16	13
50	1	5	82		50	1	5	17	14
50	2	1	104		50	2	1	22	
50	2	2	126		50	2	2	21	
50	2	3	102		50	2	3	21	
50	2	4	114		50	2	4	22	
50	2	5	130		50	2	5	22	
50	3	1	115		50	3	1	23	
50	3	2	117		50	3	2	23	
50	3	3	119		50	3	3	24	
50	3	4	110		50	3	4	23	
50	3	5	110		50	3	5	24	
50	4	1	127		50	4	1	24	
50	4	2	142		50	4	2	24	
50	4	3	122		50	4	3	24	
50	4	4	123		50	4	4	24	
50	4	5	116		50	4	5	24	
100	1	1	234	64	100	1	1	43	10
100	1	2	205	76	100	1	2	43	10
100	1	3	202	60	100	1	3	42	10
100	1	4	205	72	100	1	4	44	9
100	1	5	219	76	100	1	5	43	10
100	2	1	271	132	100	2	1	49	26
100	2	2	263	150	100	2	2	50	26
100	2	3	254	129	100	2	3	49	24
100	2	4	249	142	100	2	4	50	26
100	2	5	246	127	100	2	5	49	25
100	3	1	276	179	100	3	1	50	33
100	3	2	268	183	100	3	2	50	32
100	3	3	254	160	100	3	3	50	31
100	3	4	252	174	100	3	4	50	32
100	3	5	252	172	100	3	5	50	29
100	4	1	276	217	100	4	1	50	38
100	4	2	268	219	100	4	2	50	37
100	4	3	259	188	100	4	3	50	37
100	4	4	255	204	100	4	4	50	38
100	4	5	252	197	2 100	4	5	50	33

Table 1:

			Weighted					Unweighted		
$n$	$\delta$	$i$	$UB$	$LB$	$n$	$\delta$	$i$	$UB$	$LB$	
150	1	1	410	67	150	1	1	73	9	
150	1	2	417	69	150	1	2	73	9	
150	1	3	408	69	150	1	3	74	9	
150	1	4	401	67	150	1	4	74	9	
150	1	5	389	66	150	1	5	74	9	
150	2	1	420	156	150	2	1	75	30	
150	2	2	431	172	150	2	2	75	29	
150	2	3	423	166	150	2	3	75	29	
150	2	4	413	155	150	2	4	75	30	
150	2	5	401	165	150	2	5	75	30	
150	3	1	420	216	150	3	1	75	38	
150	3	2	431	223	150	3	2	75	37	
150	3	3	423	222	150	3	3	75	37	
150	3	4	413	211	150	3	4	75	38	
150	3	5	401	218	150	3	5	75	40	
150	4	1	420	278	150	4	1	75	45	
150	4	2	431	281	150	4	2	75	46	
150	4	3	423	269	150	4	3	75	46	
150	4	4	413	261	150	4	4	75	44	
150	4	5	401	267	150	4	5	75	46	
200	1	1	548	60	200	1	1	100	8	
200	1	2	557	69	200	1	2	99	9	
200	1	3	572	70	200	1	3	100	8	
200	1	4	556	59	200	1	4	99	8	
200	1	5	535	67	200	1	5	99	8	
200	2	1	552	175	200	2	1	100	33	
200	2	2	563	191	200	2	2	100	34	
200	2	3	577	197	200	2	3	100	34	
200	2	4	563	175	200	2	4	100	34	
200	2	5	543	173	200	2	5	100	30	
200	3	1	552	238	200	3	1	100	41	
200	3	2	563	252	200	3	2	100	42	
200	3	3	577	239	200	3	3	100	38	
200	3	4	563	231	200	3	4	100	41	
200	3	5	543	240	200	3	5	100	39	
200	4	1	552	300	200	4	1	100	47	
200	4	2	563	304	200	4	2	100	43	
200	4	3	577	293	200	4	3	100	51	
200	4	4	563	284	200	4	4	100	50	
200	4	5	543	303	3	200	4	5	100	51

Table 2:

			Weighted					Unweighted	
$n$	$\delta$	$i$	$UB$	$LB$	$n$	$\delta$	$i$	$UB$	$LB$
250	1	1	679	60	250	1	1	125	8
250	1	2	677	59	250	1	2	125	8
250	1	3	680	70	250	1	3	125	8
250	1	4	649	69	250	1	4	125	8
250	1	5	702	60	250	1	5	125	8
250	2	1	684	180	250	2	1	125	35
250	2	2	681	188	250	2	2	125	35
250	2	3	683	200	250	2	3	125	35
250	2	4	652	187	250	2	4	125	37
250	2	5	706	179	250	2	5	125	34
250	3	1	684	260	250	3	1	125	48
250	3	2	681	253	250	3	2	125	48
250	3	3	683	263	250	3	3	125	47
250	3	4	652	241	250	3	4	125	49
250	3	5	706	245	250	3	5	125	46
250	4	1	684	323	250	4	1	125	59
250	4	2	681	319	250	4	2	125	61
250	4	3	683	341	250	4	3	125	61
250	4	4	652	311	250	4	4	125	53
250	4	5	706	303	250	4	5	125	61
300	1	1	837	60	300	1	1	150	8
300	1	2	839	50	300	1	2	150	7
300	1	3	861	50	300	1	3	150	7
300	1	4	805	60	300	1	4	150	8
300	1	5	799	60	300	1	5	150	7
300	2	1	837	179	300	2	1	150	42
300	2	2	839	178	300	2	2	150	40
300	2	3	861	210	300	2	3	150	42
300	2	4	805	195	300	2	4	150	41
300	2	5	799	169	300	2	5	150	41
300	3	1	837	270	300	3	1	150	58
300	3	2	839	290	300	3	2	150	57
300	3	3	861	278	300	3	3	150	57
300	3	4	805	261	300	3	4	150	54
300	3	5	799	265	300	3	5	150	54
300	4	1	837	363	300	4	1	150	62
300	4	2	839	327	300	4	2	150	71
300	4	3	861	342	300	4	3	150	71
300	4	4	805	322	300	4	4	150	70
300	4	5	799	317	300	4	5	150	64

Table 3: