A three-phase heuristic method for identifying functionally related protein groups in weighted PPI networks - supplementary material

1. CYC data results

Results obtained on CYCDATA are shown in Tables 1-4.

Table 1: A1

instance	$|V|$	$|C|$	max card.	ILP res.	ILP t[s]	Greedy res.	Greedy t[s]	VNS best	VNS avg.	VNS t[s]
4CYC2008_dataILP_1	132	50	4	84	0.748	84	0.274	84	84	1.4634
4CYC2008_dataILP_2	258	100	4	167	1.669	167	3.476	167	167	4.1221
4CYC2008_dataILP_3	378	150	4	243	2.121	243	13.302	243	243	8.8593
4CYC2008_dataILP_4	488	200	4	314	2.09	314	37.73	314	314	16.7105
4CYC2008_dataILP_5	589	250	4	384	2.855	384	79.926	384	384	24.32
4CYC2008_dataILP_6	698	300	4	459	3.151	459	150.298	459	459	36.8358
4CYC2008_dataILP_7	703	303	4	464	3.307	464	154.302	464	464	37.3338
4CYC2008_dataILP_8	703	303	4	464	2.917	464	175.323	464	464	38.3801

Table 2: A2

instance	$|V|$	$|C|$	max card.	ILP res.	ILP t[s]	Greedy res.	Greedy t[s]	VNS best	VNS avg.	VNS t[s]
5CYC2008_dataILP_1	139	50	5	91	1.856	91	0.46	91	91	1.3718
5CYC2008_dataILP_2	272	100	5	182	15.709	182	5.367	182	182	4.375
5CYC2008_dataILP_3	396	150	5	263	18.346	263	20.88	263	263	9.3879
5CYC2008_dataILP_4	511	200	5	338	24.446	338	51.072	338	338	17.828
5CYC2008_dataILP_5	626	250	5	422	44.866	422	120.585	422	422	28.2189
5CYC2008_dataILP_6	732	300	5	492	59.515	492	219.131	492	492	38.1944
5CYC2008_dataILP_7	786	324	5	534	63.648	534	289.495	534	534	45.2417
5CYC2008_dataILP_8	786	324	5	534	54.834	534	296.062	534	534	45.9095

Table 3: A3

instance	$|V|$	$|C|$	max card.	ILP		Greedy		VNS		
				res.	t[s]	res.	t[s]	best	avg.	t[s]
6CYC2008_dataILP_1	149	50	6	101	40.248	101	0.732	101	101	1.4482
6CYC2008_dataILP_2	285	100	6	193	162.193	193	5.429	193	193	4.6653
6CYC2008_dataILP_3	414	150	6	o.m.	o.m.	281	23.495	281	281	9.7483
6CYC2008_dataILP_4	537	200	6	o.m.	o.m.	362	64.267	362	362	17.5
6CYC2008_dataILP_5	656	250	6	o.m.	o.m.	451	152.752	451	451	26.4603
6CYC2008_dataILP_6	786	300	6	o.m.	o.m.	543	278.445	543	543	40.7311
6CYC2008_dataILP_7	900	345	6	o.m.	o.m.	630	498.661	630	630	57.3483
6CYC2008_dataILP_8	900	345	6	o.m.	o.m.	630	425.392	630	630	56.6603

Table 4: A4

instance	$|V|$	$|C|$	max card.	ILP		Greedy		VNS		
				res.	t[s]	res.	t[s]	best	avg.	t[s]
7CYC2008_dataILP_1	152	50	7	o.m.	o.m.	104	0.432	104	104	1.4969
7CYC2008_dataILP_2	292	100	7	o.m.	o.m.	200	5.817	200	200	4.6452
7CYC2008_dataILP_3	429	150	7	o.m.	o.m.	296	21.309	296	296	10.6471
7CYC2008_dataILP_4	555	200	7	o.m.	o.m.	380	68.739	380	380	18.3524
7CYC2008_dataILP_5	681	250	7	o.m.	o.m.	474	134.681	474	474	28.927
7CYC2008_dataILP_6	821	300	7	o.m.	o.m.	578	319.914	578	578	43.1374
7CYC2008_dataILP_7	954	350	7	o.m.	o.m.	678	525.337	678	678	61.2066
7CYC2008_dataILP_8	963	355	7	o.m.	o.m.	687	575.537	687	687	62.6751