Weighted k-partition MAX-CUT Problem

CG conjugate gradient method, results taken from [Ye, working paper]
CH Cholesky factorization, results taken from [Ye, working paper]
RS RS Tool; lowEffort runtime settings; ran on i5 machine with 8GB memory on linux OS Fedora 14; (x220)

Graph name	graph order (|V|)	graph size (|E|)	k=2				k=3		k=4		k=5		
			cut-value			time [s]	cut-value	time [s]	cut-value	time [s]	cut-value	time [s]	
			CG	CH	RS	RS	RS	RS	RS	RS	RS	RS	
G11	800	1600	542	532	546	0.12	634	0.14	650	0.14	657	0.21	
G12	800	1600	540	534	526	0.10	624	0.11	639	0.14	639	0.14	
G13	800	1600	564	554	566	0.10	653	0.11	670	0.14	666	0.21	
G14	800	4694	2922	2982	2999	0.26	3953	0.31	4366	0.42	4583	0.46	
G15	800	4661	2938	2975	2981	0.28	3918	0.30	4347	0.48	4552	0.50	
G20	800	4672	838	876	846	0.34	1036	0.36	1090	0.40	1075	0.40	
G21	800	4667	841	855	847	0.32	994	0.36	1039	0.40	1098	0.38	
G22	2000	19990	12960	12989	13091	0.30	16894	0.35	18503	0.48	19356	0.56	
G23	2000	19990	13006	13002	13073	0.21	16905	0.38	18545	0.52	19381	0.58	
G24	2000	19990	12933	12985	13096	0.25	16900	0.26	18567	0.44	19360	0.44	
G30	2000	19990	3038	3080	3127	0.21	3814	0.27	3995	0.38	4027	0.36	
G31	2000	19990	2851	2936	3019	0.26	3707	0.33	3898	0.45	3914	0.46	
G32	2000	4000	1338	1302	1354	0.30	1575	0.32	1599	0.32	1620	0.50	
G33	2000	4000	1330	1286	1332	0.30	1538	0.33	1583	0.44	1592	0.46	
G34	2000	4000	1334	1292	1338	0.32	1525	0.36	1566	0.43	1572	0.47	
G48	3000	6000	6000	6000	5780	0.30	5990	0.30	6000	0.27	6000	0.26	
G49	3000	6000	6000	6000	5940	0.31	5990	0.33	6000	0.34	6000	0.34	
G50	3000	6000	5880	5880	5830	0.36	5988	0.35	6000	0.34	6000	0.26	
G55	5000	12498	9960	9960	9922	0.32	12205	0.46	12498	0.51	12498	0.42	
G56	5000	12498	3634	3649	3685	0.34	4321	0.36	4562	0.72	4592	0.56	
G57	5000	10000	3320	3208	3378	0.40	3898	0.50	4005	0.57	4022	0.69	
G60	7000	17148	13610	13658	13665	0.40	16783	0.82	17148	0.57	17148	0.41	
G61	7000	17148	5252	5273	5214	0.36	6363	0.66	6655	1.06	6716	0.75	
G62	7000	14000	4612	4476	4736	0.55	5434	0.65	5593	0.72	5602	0.77	
G63	7000	41459	8017	8059	26484	0.53	34784	0.90	38665	1.38	40496	1.49	1*
G64	7000	41459	7624	7861	7975	0.36	9617	0.70	10119	0.98	10219	0.84	
G65	8000	16000	13261	13286	5362	0.38	6203	0.64	6349	0.78	6400	1.07	2*
G70	10000	9999	9456	9499	9170	0.32	9999	0.46	9999	0.49	9999	0.42	
G72	10000	20000	6644	6370	6792	0.84	7839	0.76	8047	1.13	8083	1.04	
G77	14000	28000	9418	9048	9662	1.22	11089	0.97	11412	1.36	11447	1.85	
G81	20000	40000	13448	--	13702	2.67	15612	1.80	16096	2.22	16148	2.10	

1* RS cut-value is >3x of CG&CH. This does not seem right. Are we using the same input file (G63)?

2* CG,CH cut-values: G65 graph has a total of 16000 edges. 7959 of the edges are assigned weight of "1", and the rest (8041) "-1". Thus, max possible cut-value (when all "1" edges are cut and no "-1" edge is cut) is 7959. CH & CG report values that are almost 2x of the max possible. Are we using the same input file (G65)?

Weighted k-partition MAX-CUT Problem, equal (approximately equal) size partitions

RS RS Tool; lowEffort runtime settings; ran on i5 machine with 8GB memory on linux OS Fedora 14; (x220)

Graph name	k=2		k=3		k=4		k=5	
	cut-value	time [s]	cut-value	time [s]	cut-value	time [s]	cut-value	time [s]
	RS	RS	RS	RS	RS	RS	RS	RS
G11	534	0.12	618	0.14	631	0.14	644	0.21
G12	504	0.1	606	0.11	625	0.14	631	0.14
G13	542	0.1	639	0.11	656	0.14	654	0.21
G14	2994	0.26	3938	0.31	4343	0.42	4548	0.46
G15	2972	0.28	3872	0.3	4321	0.48	4531	0.5
G20	864	0.34	1000	0.36	1026	0.4	1043	0.4
G21	820	0.32	1009	0.36	1032	0.4	1022	0.38
G22	12992	0.3	16822	0.35	18434	0.48	19270	0.56
G23	13044	0.21	16795	0.38	18415	0.52	19251	0.58
G24	12992	0.25	16789	0.26	18409	0.44	19264	0.44
G30	3147	0.21	3744	0.27	3909	0.38	3871	0.36
G31	3095	0.26	3622	0.33	3699	0.45	3782	0.46
G32	1302	0.3	1528	0.32	1598	0.32	1599	0.5
G33	1300	0.3	1515	0.33	1550	0.44	1565	0.46
G34	1294	0.32	1500	0.36	1534	0.43	1562	0.47
G48	5584	0.3	5976	0.3	6000	0.27	6000	0.26
G49	5650	0.31	5968	0.33	6000	0.34	6000	0.34
G50	5670	0.36	5980	0.35	6000	0.34	6000	0.26
G55	9936	0.32	12154	0.46	12497	0.51	12498	0.42
G56	3646	0.34	4374	0.36	4515	0.72	4606	0.56
G57	3306	0.4	3850	0.5	3985	0.57	3994	0.69
G60	13676	0.4	16749	0.82	17148	0.57	17148	0.41
G61	5233	0.36	6329	0.66	6643	1.06	6667	0.75
G62	4634	0.55	5402	0.65	5542	0.72	5587	0.77
G63	26562	0.53	34713	0.9	38502	1.38	40397	1.49
G64	8047	0.36	9668	0.7	10119	0.98	10094	0.84
G65	5288	0.38	6136	0.64	6357	0.78	6364	1.07
G70	9243	0.32	9998	0.46	9999	0.49	9999	0.42
G72	6672	0.84	7800	0.76	8005	1.13	8080	1.04
G77	9510	1.22	11041	0.97	11342	1.36	11412	1.85
G81	13454	2.67	15669	1.8	16039	2.22	16145	2.1

Weighted k-partition MAX-CUT Problem, unequal size partitions

RS RS Tool; lowEffort runtime settings; ran on i5 machine with 8GB memory on linux OS Fedora 14; (x220)

Graph name	k=2		k=3		k=4		k=5	
	cut-value	time [s]	cut-value	time [s]	cut-value	time [s]	cut-value	time [s]
	RS	RS	RS	RS	RS	RS	RS	RS
G11	496	0.1	597	0.11	625	0.19	620	0.28
G12	464	0.08	584	0.11	589	0.12	620	0.34
G13	486	0.09	612	0.1	633	0.16	644	0.29
G14	2907	0.25	3876	0.34	4243	0.37	4505	0.61
G15	2924	0.27	3855	0.34	4235	0.37	4510	0.76
G20	737	0.31	998	0.37	1019	0.45	1067	0.74
G21	736	0.3	942	0.36	1017	0.45	1032	0.72
G22	11192	0.25	15852	0.58	17470	0.86	18911	2.4
G23	11212	0.26	15770	0.46	17446	0.88	18876	2.18
G24	11251	0.34	15855	0.55	17523	1.04	18907	2.6
G30	2840	0.35	3644	0.44	3825	1.24	3851	2.6
G31	2751	0.27	3541	0.58	3644	0.59	3758	4.61
G32	1238	0.27	1521	0.39	1546	0.42	1598	1.03
G33	1200	0.23	1466	0.34	1520	0.4	1547	1.02
G34	1194	0.27	1476	0.41	1521	0.48	1543	1.02
G48	3600	0.18	5710	0.43	5997	0.38	6000	0.47
G49	3600	0.18	5759	0.4	5997	0.3	6000	0.51
G50	3600	0.14	5760	0.5	5999	0.4	6000	0.53
G55	8714	0.3	11718	0.7	12390	0.7	12497	0.74
G56	3361	0.38	4205	0.68	4411	1.06	4526	4.2
G57	3042	0.41	3767	0.59	3905	1.03	3955	2.62
G60	11981	0.52	16122	0.83	17011	1	17148	0.91
G61	4806	0.61	6128	0.88	6438	1.8	6619	5.42
G62	4282	0.51	5269	0.86	5420	1.46	5527	3.78
G63	25913	0.69	34247	1.58	37807	3.11	40007	5.83
G64	7341	0.58	9383	1.41	9847	2.2	9998	7.15
G65	4918	0.59	6031	0.94	6210	1.74	6318	6.03
G70	7988	0.5	9992	0.6	9999	0.5	9999	0.62
G72	6102	0.61	7581	1.29	7851	2.32	8036	9.19
G77	8814	1.31	10747	1.99	11194	3.76	11339	13.23
G81	12456	1.59	15305	3.56	15792	6.21	16083	23.12

partitions sizes (|Si|/|V|)

k	|S0|	|S1|	|S2|	|S3|	|S4|
2	0.3	0.7			
3	0.2	0.3	0.5		
4	0.1	0.2	0.3	0.4	
5	0.1	0.2	0.2	0.2	0.3