

Biq Mac Library part 2 - large instances

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1 Quadratic 0-1 Programming problems

The problem to be solved is the following:

$$\min\{y^T Q y : y \in \{0, 1\}^n\},$$

where Q is a symmetric matrix of order n .

1.1 Beasley instances

2 Max-Cut instances

The problem to be solved is

$$\max\{x^T L x : x \in \{-1, 1\}^n\},$$

where L is the Laplace matrix of the given graph of n vertices.

2.1 Max-Cut instances generated with rudy

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Problem name	solution	lower bound	time	terminationcode
$n = 500, d = 0.1$				
bqp1000-1.sparse	≤ -313554	-1099060.40	3h	not terminated
bqp1000-2.sparse	≤ -321843	-1081420.70	3h	not terminated
bqp1000-3.sparse	≤ -321843	-1081420.70	3h	not terminated
bqp1000-4.sparse	≤ -319161	-1090515.70	3h	not terminated
bqp1000-5.sparse	≤ -312107	-1013944.50	3h	not terminated
bqp1000-6.sparse	≤ -337905	-1130286.10	3h	not terminated
bqp1000-7.sparse	≤ -324935	-1132657.90	3h	not terminated
bqp1000-8.sparse	≤ -315873	-1050845.20	3h	not terminated
bqp1000-9.sparse	≤ -323896	-1062541.00	3h	not terminated
bqp1000-10.sparse	≤ -326342	-1070584.90	3h	not terminated
bqp2500-1.sparse	≤ -938260	-1216648.70	3h	not terminated
bqp2500-2.sparse	≤ -1196679	-2409858.00	3h	not terminated
bqp2500-3.sparse	≤ -1293141	-24252509.00	3h	not terminated
bqp2500-4.sparse	≤ -1242889	-24924060	3h	not terminated
bqp2500-5.sparse	≤ -1216870	-24259735	3h	not terminated
bqp2500-6.sparse	≤ -1230187	-24453278	3h	not terminated
bqp2500-7.sparse	≤ -1242411	-24548542	3h	not terminated
bqp2500-8.sparse	≤ -1262588	-24389751	3h	not terminated
bqp2500-9.sparse	≤ -1241359	-25003483	3h	not terminated
bqp2500-10.sparse	≤ -1242782	-24875407	3h	not terminated

Table 1: Beasley data. For details see Section 1.1 on page 1.

Problem name	solution	lower bound
$n = 500, d = 0.1$		
bqp500-1	≤ -116586	-121588.41
bqp500-2	≤ -128223	-132216.45
bqp500-3	≤ -130812	-134214.12
bqp500-4	≤ -130097	-134781.02
bqp500-5	≤ -125487	-129572.87
bqp500-6	≤ -121772	-126429.50
bqp500-7	≤ -122201	-127136.37
bqp500-8	≤ -123559	-128574.61
bqp500-9	≤ -120798	-125821.63
bqp500-10	≤ -130619	-134352.34

Table 2: Beasley data. For details see Section 1.1 on page 1.

Problem name	best found cut value	upper bound	time	terminationcode
$n = 500, d = 0.1$				
G1	≥ 11602	12083.26	271 sec	terminated
G2	≥ 11599	12089.51	272 sec	terminated
G3	≥ 11580	12084.40	240 sec	terminated
G4	≥ 11617	12111.53	245 sec	terminated
G5	≥ 11604	12099.95	234 sec	terminated
G6	≥ 1971	2489.74	270 sec	terminated
G7	≥ 1971	2489.28	269 sec	terminated
G8	≥ 1986	2506.95	245 sec	terminated
G9	≥ 2036	2528.75	351 sec	terminated
G10	≥ 1966	2585.08	256 sec	terminated
G11	≥ 558	629.17	140 sec	terminated
G12	≥ 548	623.88	91 sec	terminated
G13	≥ 578	647.14	80 sec	terminated
G14	≥ 3044	3191.59	187 sec	terminated
G15	≥ 3033	3171.58	160 sec	terminated
G16	≥ 3044	3175.04	191 sec	terminated
G17	≥ 3033	3171.35	180 sec	terminated
G18	≥ 986	1166.02	167 sec	terminated
G19	≥ 891	1082.02	160 sec	terminated
G20	≥ 941	1111.40	146 sec	terminated
G21	≥ 914	1104.29	162 sec	terminated
G22	≥ 13282	14136.03	3017 sec	terminated
G23	≥ 13300	14145.60	2743 sec	terminated
G24	≥ 13274	14140.89	2902 sec	terminated
G25	≥ 13281	14144.29	2914 sec	terminated
G26	≥ 13289	14133.01	3521 sec	terminated
G27	≥ 3271	4141.69	3149 sec	terminated
G28	≥ 3247	4100.83	4112 sec	terminated
G29	≥ 3328	4208.92	2285 sec	terminated
G30	≥ 3329	4215.42	2514 sec	terminated
G31	≥ 3271	4116.70	4212 sec	terminated
G32	≥ 1390	1567.65	1221 sec	terminated
G33	≥ 1352	1544.32	1116 sec	terminated

Problem name	best found cut value	upper bound	time	terminationcode
$n = 500, d = 0.1$				
G34	≥ 13666	1546.70	964 sec	
G35	≥ 7633	8014.79	3116 sec	
G36	≥ 7635	8006.03	4181 sec	terminated
G37	≥ 7643	8018.68	3695 sec	terminated
G38	≥ 7629	8015.04	3394 sec	terminated
G39	≥ 2382	2877.67	2474 sec	terminated
G40	≥ 2334	2839.14	2700 sec	terminated
G41	≥ 2390	2865.24	3293 sec	terminated
G42	≥ 2449	2946.27	2985 sec	terminated
G43	≥ 6648	7232.27	248 sec	terminated
G44	≥ 6631	7027.93	274 sec	terminated
G45	≥ 6630	7024.83	300 sec	terminated
G46	≥ 6633	7029.99	301 sec	terminated
G47	≥ 6634	7036.71	305 sec	terminated
G48	≥ 6000	6000.01	2 sec	terminated
G49	≥ 6000	6000.01	2 sec	terminated
G50	≥ 5880	5988.18	34 sec	terminated
G51	≥ 3824	4006.28	333 sec	terminated
G52	≥ 3829	4009.67	361 sec	terminated
G53	≥ 3837	4009.74	356 sec	terminated
G54	≥ 3825	4006.23	363 sec	terminated
G55	≥ 11837	12875.70	3 h	not terminated
G56	≥ 3873	4792.95	3h	not terminated
G57	≥ 3366	3884.46	3h	not terminated
G58	≥ 18782	25280.75	3h	not terminated
G59	≥ 5542	12720.24	3h	not terminated
G60	≥ 13958	15565.51	3h	not terminated
G61	≥ 5550	7099.96	3 h	not terminated
G62	≥ 4788	5615.07	3h	not terminated
G63	≥ 26079	46673.80	3h	not terminated
G64	≥ 7516	29266.20	3 h	not terminated
G65	≥ 5268	6277.86	3h	not terminated
G66	≥ 5886	7108.61	3h	not terminated
G67	≥ 6562	8078.72	3h	not terminated

Table 3: Beasley data. For details see Section 1.1 on page 1.