Table 1: Experimental results on BHOSLIB benchmark.

Graph	$sol\ best$	PbO-MWC		MN/TS		LSCC		LSCC+BMS		RRWL		TSM-MWC	
		$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	$(time)$ $PAR10$
frb45-21-1	4760	**100**	(**13.453**) **13.453**	**100**	(68.809) 68.809	46	(1349.447) 20130.003	42	(1414.568) 21588.113	51	(1085.535) 18285.963	0	(1029.450) 36000.000
frb45-21-2	4784	**100**	(**1.492**) **1.492**	**100**	(14.099) 14.099	78	(1326.001) 8925.498	70	(1352.767) 11783.412	57	(1032.973) 16059.772	0	(2733.750) 36000.000
frb45-21-3	4765	**100**	(**2.256**) **2.256**	**100**	(22.378) 22.378	53	(1607.364) 17847.070	51	(1638.062) 18573.679	64	(1288.928) 13741.759	0	(1563.770) 36000.000
frb45-21-4	4799	**100**	(**1.568**) **1.568**	**100**	(49.663) 49.663	67	(1442.893) 12910.056	59	(1510.165) 15672.206	85	(1139.340) 6361.269	0	(1329.360) 36000.000
frb45-21-5	4779	**100**	(**2.370**) **2.370**	**100**	(5.323) 5.323	**100**	(301.269) 301.269	**100**	(338.229) 338.229	95	(393.415) 2163.571	0	(1772.870) 36000.000
frb30-15-1	2990	**100**	(**0.179**) **0.179**	**100**	(0.313) 0.313	**100**	(3.979) 3.979	**100**	(4.751) 4.751	**100**	(2.606) 2.606	0	(2394.070) 36000.000
frb30-15-2	3006	100	(**0.028**) **0.028**	100	(0.934) 0.934	100	(3.404) 3.404	100	(3.696) 3.696	100	(2.604) 2.604	100	(900.900) 900.900
frb30-15-3	2995	100	(**0.265**) **0.265**	100	(0.635) 0.635	100	(13.648) 13.648	100	(14.819) 14.819	100	(4.423) 4.423	100	(1562.590) 1562.590
frb30-15-4	3032	100	(**0.005**) **0.005**	100	(0.079) 0.079	100	(0.289) 0.289	100	(0.415) 0.415	100	(0.747) 0.747	100	(296.190) 296.190
frb30-15-5	3011	100	(**0.028**) **0.028**	100	(0.684) 0.684	100	(3.524) 3.524	100	(3.994) 3.994	100	(2.340) 2.340	100	(2000.440) 2000.440
frb35-17-1	3650	**100**	(**1.514**) **1.514**	**100**	(4.672) 4.672	**100**	(91.153) 91.153	**100**	(107.303) 107.303	**100**	(38.994) 38.994	0	(3354.780) 36000.000
frb35-17-2	3738	**100**	(**2.486**) **2.486**	**100**	(28.094) 28.094	**100**	(151.364) 151.364	**100**	(173.864) 173.864	**100**	(196.664) 196.664	0	(3276.140) 36000.000
frb35-17-3	3716	**100**	(**0.420**) **0.420**	**100**	(4.365) 4.365	**100**	(42.298) 42.298	**100**	(49.195) 49.195	**100**	(29.877) 29.877	0	(2267.320) 36000.000
frb35-17-4	3683	**100**	(**0.405**) **0.405**	**100**	(4.245) 4.245	**100**	(328.516) 328.516	**100**	(406.264) 406.264	**100**	(136.796) 136.796	0	(3440.670) 36000.000
frb35-17-5	3686	**100**	(**0.520**) **0.520**	**100**	(1.058) 1.058	**100**	(20.187) 20.187	**100**	(22.571) 22.571	**100**	(19.197) 19.197	0	(2461.840) 36000.000
frb40-19-1	4063	**100**	(**6.050**) **6.050**	**100**	(11.478) 11.478	**100**	(341.834) 341.834	**100**	(438.977) 438.977	**100**	(497.250) 497.250	0	(3344.290) 36000.000
frb40-19-2	4112	**100**	(**2.319**) **2.319**	**100**	(23.773) 23.773	99	(656.502) 1014.999	99	(747.700) 1105.990	98	(879.786) 1557.711	0	(3584.080) 36000.000
frb40-19-3	4115	**100**	(**11.831**) **11.831**	**100**	(72.378) 72.378	97	(913.408) 1972.914	94	(1017.261) 3121.678	92	(898.788) 3686.884	0	(2150.580) 36000.000
frb40-19-4	4136	**100**	(**0.798**) **0.798**	**100**	(65.162) 65.162	97	(850.168) 1927.852	96	(921.804) 2358.761	95	(823.619) 2618.070	0	(1722.160) 36000.000
frb40-19-5	4118	**100**	(**3.526**) **3.526**	**100**	(16.579) 16.579	**100**	(434.633) 434.633	**100**	(514.314) 514.314	97	(317.954) 1388.126	0	(1008.240) 36000.000
frb50-23-1	5494	**100**	(**137.157**) **137.157**	77	(1532.625) 9474.882	3	(1643.836) 34981.612	1	(1741.232) 35649.330	3	(1375.311) 34966.213	0	(3040.930) 36000.000
frb50-23-2	5462	**100**	(**162.683**) **162.683**	71	(1154.720) 11576.701	6	(1577.357) 33955.431	5	(1652.677) 34297.137	10	(1372.736) 32605.037	0	(319.980) 36000.000
frb50-23-3	5486	**100**	(**17.639**) **17.639**	**100**	(47.560) 47.560	17	(1703.953) 30208.511	11	(1619.835) 32249.283	17	(1326.604) 30095.012	0	(2949.470) 36000.000
frb50-23-4	5454	**100**	(**625.319**) **625.319**	58	(919.783) 16014.094	0	(1792.514) 36000.000	0	(1729.724) 36000.000	1	(1256.577) 35650.034	0	(3560.910) 36000.000
frb50-23-5	5498	**100**	(**3.629**) **3.629**	**100**	(26.746) 26.746	70	(1578.170) 11849.377	62	(1653.499) 14684.862	60	(1284.259) 15156.454	0	(2748.320) 36000.000
frb53-24-1	5670	**100**	(**29.047**) **29.047**	**100**	(398.036) 398.036	7	(1666.790) 33595.299	3	(1788.058) 34963.692	7	(1424.357) 33568.168	0	(562.150) 36000.000
frb53-24-2	5707	**100**	(**69.078**) **69.078**	54	(1681.134) 17386.738	2	(1756.783) 35312.403	3	(1668.641) 34964.318	2	(1245.848) 35319.164	0	(3453.760) 36000.000
frb53-24-3	5655	**98**	(780.303) **1500.215**	29	(666.191) 26088.117	1	(1836.278) 35641.574	1	(1960.289) 35641.670	0	(1511.852) 36000.000	0	(3433.890) 36000.000
frb53-24-4	5714	**100**	(**59.110**) **59.110**	30	(1051.233) 25735.082	0	(1730.691) 36000.000	0	(1801.601) 36000.000	0	(1536.212) 36000.000	0	(2215.230) 36000.000
frb53-24-5	5659	**100**	(**330.778**) **330.778**	42	(1664.354) 21615.900	0	(1641.510) 36000.000	0	(1635.425) 36000.000	1	(1314.714) 35656.244	0	(1657.180) 36000.000
frb56-25-1	5916	**100**	(**23.410**) **23.410**	97	(935.194) 1960.830	1	(1996.991) 35668.138	1	(1779.035) 35665.592	2	(1459.226) 35311.057	0	(3456.430) 36000.000
frb56-25-2	5886	**100**	(**19.245**) **19.245**	35	(1727.162) 23987.410	1	(1770.091) 35657.961	0	(1798.876) 36000.000	1	(1495.152) 35660.728	0	(1467.520) 36000.000
frb56-25-3	5859	**100**	(**550.672**) **550.672**	20	(1498.373) 29133.661	0	(1868.919) 36000.000	0	(1799.464) 36000.000	0	(1461.475) 36000.000	0	(2619.290) 36000.000
frb56-25-4	5892	**100**	(**449.992**) **449.992**	30	(1719.638) 25726.903	0	(1765.438) 36000.000	0	(1862.983) 36000.000	0	(1434.981) 36000.000	0	(2525.100) 36000.000
frb56-25-5	5853	**97**	(**979.024**) **2031.460**	12	(1594.286) 31942.823	0	(1625.700) 36000.000	0	(1730.110) 36000.000	0	(1599.427) 36000.000	0	(2425.130) 36000.000
frb59-26-1	6591	**100**	(**30.810**) **30.810**	**100**	(464.091) 464.091	0	(1693.629) 36000.000	0	(1737.817) 36000.000	1	(1367.452) 35645.171	0	(2930.000) 36000.000
frb59-26-2	6645	**100**	(**63.459**) **63.459**	99	(632.977) 979.705	2	(1875.558) 35316.186	0	(1843.966) 36000.000	1	(1470.946) 35659.913	0	(2124.560) 36000.000
frb59-26-3	6608	**100**	(**47.644**) **47.644**	34	(1534.772) 24301.950	0	(1991.458) 36000.000	0	(1930.665) 36000.000	0	(1513.631) 36000.000	0	(1590.650) 36000.000
frb59-26-4	6592	**100**	(111.358) **111.358**	95	(988.683) 2730.186	1	(1678.177) 35651.271	1	(1727.378) 35649.910	1	(1502.068) 35649.154	0	(23.280) 36000.000
frb59-26-5	6584	**100**	(**383.178**) **383.178**	48	(1429.216) 19412.745	0	(1652.560) 36000.000	0	(1797.136) 36000.000	0	(1536.050) 36000.000	0	(2806.550) 36000.000

Table 2: Experimental results on DIMACS benchmark - Part I.

Graph	PbO-MWC		MN/TS		LSCC		LSCC+BMS		RRWL		TSM-MWC	
	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	w_{sol}	$time$
MANN_a45	34263(34262.60)	36000.000(1436.653)	34226(34199.31)	36000.000(1815.412)	34256(34254.02)	36000.000(425.650)	34258(34253.84)	36000.000(1291.260)	34263(34254.72)	36000.000(357.249)	**34265**	**404.800**(404.800)
brock800_4	2971(**2971.00**)	134.953(134.953)	2971(2970.98)	1494.712(774.713)	2971(2970.80)	8376.847(1176.934)	2971(2970.78)	9047.923(1128.025)	2971(**2971.00**)	**126.596**(**126.596**)	2971	2540.720(2540.720)
C2000.9	**10999**(**10999.00**)	**73.375**(**73.375**)	**10999**(**10999.00**)	191.816(191.816)	**10999**(10951.90)	33594.936(1919.433)	**10999**(10951.25)	33955.945(1902.930)	**10999**(10951.41)	33213.319(1437.638)	8338	36000.000(2311.820)
c-fat500-10	11586(11586.00)	0.003(0.003)	11586(11586.00)	0.059(0.059)	11586(11586.00)	<**0.001**(<**0.001**)	11586(11586.00)	<**0.001**(<**0.001**)	11586(11586.00)	0.379(0.379)	11586	0.190(0.190)
DSJC1000.5	2186(2186.00)	**0.044**(**0.044**)	2186(2186.00)	0.047(0.047)	2186(2186.00)	5.955(5.955)	2186(2186.00)	5.989(5.989)	2186(2186.00)	1.158(1.158)	2186	54.910(54.910)
gen400_p0.9_75	8006(8006.00)	<**0.001**(<**0.001**)	8006(8006.00)	0.007(0.007)	8006(8006.00)	0.638(0.638)	8006(8006.00)	0.693(0.693)	8006(8006.00)	0.538(0.538)	8006	77.200(77.200)
hamming10-2	50512(50512.00)	**0.106**(**0.106**)	50512(50512.00)	0.652(0.652)	50512(50512.00)	0.588(0.588)	50512(50512.00)	0.516(0.516)	50512(50512.00)	0.966(0.966)	50512	43.290(43.290)
johnson32-2-4	**2033**(**2033.00**)	<**0.001**(<**0.001**)	**2033**(**2033.00**)	0.811(0.811)	**2033**(**2033.00**)	0.151(0.151)	**2033**(**2033.00**)	0.154(0.154)	**2033**(**2033.00**)	0.410(0.410)	1891	36000.000(10.590)
p_hat1500-3	10321(10321.00)	**0.434**(**0.434**)	10321(10321.00)	29.639(29.639)	10321(10321.00)	113.621(113.621)	10321(10321.00)	117.621(117.621)	10321(10321.00)	30.924(30.924)	10321	3336.320(3336.320)
san400_0.9_1	9776(9776.00)	2.282(2.282)	9776(9776.00)	**1.646**(**1.646**)	9776(9776.00)	2.848(2.848)	9776(9776.00)	3.218(3.218)	9776(9776.00)	3.511(3.511)	9776	75.290(75.290)
MANN_a27	**12283**(**12283.00**)	4.473(4.473)	12282(12276.98)	36000.000(1377.077)	**12283**(**12283.00**)	129.249(129.249)	**12283**(**12283.00**)	251.788(251.788)	**12283**(**12283.00**)	270.134(270.134)	**12283**	**4.400**(**4.400**)
MANN_a81	**111364**(**111336.89**)	36000.000(1740.083)	110171(110090.74)	36000.000(1818.422)	111302(111250.54)	36000.000(1639.686)	111269(111207.88)	36000.000(1861.101)	111324(111303.34)	36000.000(1784.362)	109970	36000.000(3202.890)
MANN_a9	372(372.00)	<**0.001**(<**0.001**)	372(372.00)	<**0.001**(<**0.001**)	372(372.00)	<**0.001**(<**0.001**)	372(372.00)	<**0.001**(<**0.001**)	372(372.00)	0.346(0.346)	372	0.090(0.090)
brock200_1	2821(2821.00)	<**0.001**(<**0.001**)	2821(2821.00)	<**0.001**(<**0.001**)	2821(2821.00)	0.004(0.004)	2821(2821.00)	0.002(0.002)	2821(2821.00)	0.379(0.379)	2821	0.290(0.290)
brock200_2	1428(1428.00)	<**0.001**(<**0.001**)	1428(1428.00)	<**0.001**(<**0.001**)	1428(1428.00)	0.004(0.004)	1428(1428.00)	0.001(0.001)	1428(1428.00)	0.370(0.370)	1428	0.090(0.090)
brock200_3	2062(2062.00)	<**0.001**(<**0.001**)	2062(2062.00)	<**0.001**(<**0.001**)	2062(2062.00)	<**0.001**(<**0.001**)	2062(2062.00)	<**0.001**(<**0.001**)	2062(2062.00)	0.379(0.379)	2062	0.190(0.190)
brock200_4	2107(2107.00)	<**0.001**(<**0.001**)	2107(2107.00)	<**0.001**(<**0.001**)	2107(2107.00)	0.001(0.001)	2107(2107.00)	0.001(0.001)	2107(2107.00)	0.373(0.373)	2107	0.190(0.190)
brock400_1	3422(3422.00)	<**0.001**(<**0.001**)	3422(3422.00)	<**0.001**(<**0.001**)	3422(3422.00)	0.176(0.176)	3422(3422.00)	0.172(0.172)	3422(3422.00)	0.428(0.428)	3422	93.190(93.190)
brock400_2	3350(3350.00)	<**0.001**(<**0.001**)	3350(3350.00)	0.001(0.001)	3350(3350.00)	0.442(0.442)	3350(3350.00)	0.451(0.451)	3350(3350.00)	0.461(0.461)	3350	105.100(105.100)
brock400_3	3471(3471.00)	**0.001**(**0.001**)	3471(3471.00)	**0.001**(**0.001**)	3471(3471.00)	0.406(0.406)	3471(3471.00)	0.419(0.419)	3471(3471.00)	0.456(0.456)	3471	7.710(7.710)
brock400_4	3626(3626.00)	**0.751**(**0.751**)	3626(3626.00)	0.988(0.988)	3626(3626.00)	12.447(12.447)	3626(3626.00)	13.083(13.083)	3626(3626.00)	1.634(1.634)	3626	136.900(136.900)
brock800_1	3121(3121.00)	0.012(0.012)	3121(3121.00)	**0.010**(**0.010**)	3121(3121.00)	0.177(0.177)	3121(3121.00)	0.175(0.175)	3121(3121.00)	0.578(0.578)	3121	1000.010(1000.010)
brock800_2	3043(3043.00)	**0.041**(**0.041**)	3043(3043.00)	0.044(0.044)	3043(3043.00)	1.174(1.174)	3043(3043.00)	1.194(1.194)	3043(3043.00)	0.830(0.830)	3043	2316.700(2316.700)
brock800_3	3076(3076.00)	**0.031**(**0.031**)	3076(3076.00)	0.037(0.037)	3076(3076.00)	0.265(0.265)	3076(3076.00)	0.268(0.268)	3076(3076.00)	0.721(0.721)	3076	1078.990(1078.990)
C1000.9	**9254**(**9254.00**)	**0.746**(**0.746**)	**9254**(**9254.00**)	1.201(1.201)	**9254**(**9254.00**)	177.922(177.922)	**9254**(**9254.00**)	186.512(186.512)	**9254**(**9254.00**)	63.886(63.886)	7477	36000.000(2806.730)
C125.9	2529(2529.00)	<**0.001**(<**0.001**)	2529(2529.00)	<**0.001**(<**0.001**)	2529(2529.00)	0.227(0.227)	2529(2529.00)	0.235(0.235)	2529(2529.00)	0.399(0.399)	2529	0.190(0.190)
C2000.5	2466(2466.00)	0.678(0.678)	2466(2466.00)	**0.577**(**0.577**)	2466(2466.00)	2.637(2.637)	2466(2466.00)	2.641(2.641)	2466(2466.00)	3.156(3.156)	2466	1063.770(1063.770)
C250.9	5092(5092.00)	<**0.001**(<**0.001**)	5092(5092.00)	<**0.001**(<**0.001**)	5092(5092.00)	0.182(0.182)	5092(5092.00)	0.196(0.196)	5092(5092.00)	0.425(0.425)	5092	21.490(21.490)
C4000.5	**2792**(**2792.00**)	**13.388**(**13.388**)	**2792**(**2792.00**)	14.050(14.050)	**2792**(**2792.00**)	77.724(77.724)	**2792**(**2792.00**)	79.793(79.793)	**2792**(**2792.00**)	129.973(129.973)	2502	36000.000(3497.290)
C500.9	**6955**(**6955.00**)	**0.001**(**0.001**)	**6955**(**6955.00**)	0.002(0.002)	**6955**(**6955.00**)	1.692(1.692)	**6955**(**6955.00**)	1.801(1.801)	**6955**(**6955.00**)	0.816(0.816)	6570	36000.000(3556.600)
c-fat200-1	1284(1284.00)	<**0.001**(<**0.001**)	1284(1284.00)	<**0.001**(<**0.001**)	1284(1284.00)	<**0.001**(<**0.001**)	1284(1284.00)	<**0.001**(<**0.001**)	1284(1284.00)	0.335(0.335)	1284	0.080(0.080)
c-fat200-2	2411(2411.00)	<**0.001**(<**0.001**)	2411(2411.00)	0.158(0.158)	2411(2411.00)	<**0.001**(<**0.001**)	2411(2411.00)	<**0.001**(<**0.001**)	2411(2411.00)	0.343(0.343)	2411	0.090(0.090)
c-fat200-5	5887(5887.00)	<**0.001**(<**0.001**)	5887(5887.00)	0.014(0.014)	5887(5887.00)	<**0.001**(<**0.001**)	5887(5887.00)	<**0.001**(<**0.001**)	5887(5887.00)	0.339(0.339)	5887	0.090(0.090)
c-fat500-1	1354(1354.00)	<**0.001**(<**0.001**)	1354(1354.00)	0.003(0.003)	1354(1354.00)	<**0.001**(<**0.001**)	1354(1354.00)	<**0.001**(<**0.001**)	1354(1354.00)	0.355(0.355)	1354	0.090(0.090)
c-fat500-2	2628(2628.00)	0.001(0.001)	2628(2628.00)	0.632(0.632)	2628(2628.00)	<**0.001**(<**0.001**)	2628(2628.00)	<**0.001**(<**0.001**)	2628(2628.00)	0.359(0.359)	2628	0.090(0.090)
c-fat500-5	5841(5841.00)	0.001(0.001)	5841(5841.00)	0.222(0.222)	5841(5841.00)	<**0.001**(<**0.001**)	5841(5841.00)	<**0.001**(<**0.001**)	5841(5841.00)	0.381(0.381)	5841	0.090(0.090)
DSJC500.5	1725(1725.00)	<**0.001**(<**0.001**)	1725(1725.00)	0.012(0.012)	1725(1725.00)	0.865(0.865)	1725(1725.00)	0.873(0.873)	1725(1725.00)	0.428(0.428)	1725	1.490(1.490)
gen200_p0.9_44	5043(5043.00)	<**0.001**(<**0.001**)	5043(5043.00)	<**0.001**(<**0.001**)	5043(5043.00)	0.043(0.043)	5043(5043.00)	0.045(0.045)	5043(5043.00)	0.367(0.367)	5043	0.290(0.290)
gen200_p0.9_55	5416(5416.00)	0.011(0.011)	5416(5416.00)	**0.002**(**0.002**)	5416(5416.00)	0.077(0.077)	5416(5416.00)	0.075(0.075)	5416(5416.00)	0.369(0.369)	5416	0.890(0.890)
gen400_p0.9_55	**6718**(**6718.00**)	**0.007**(**0.007**)	**6718**(**6718.00**)	0.014(0.014)	**6718**(**6718.00**)	3.486(3.486)	**6718**(**6718.00**)	3.686(3.686)	**6718**(**6718.00**)	1.737(1.737)	6661	36000.000(795.220)
gen400_p0.9_65	**6940**(**6940.00**)	0.001(0.001)	**6940**(**6940.00**)	<**0.001**(<**0.001**)	**6940**(**6940.00**)	3.539(3.539)	**6940**(**6940.00**)	3.734(3.734)	**6940**(**6940.00**)	0.855(0.855)	6700	36000.000(2364.020)
hamming10-4	**5129**(**5129.00**)	**1.489**(**1.489**)	**5129**(**5129.00**)	2.846(2.846)	**5129**(**5129.00**)	19.140(19.140)	**5129**(**5129.00**)	21.761(21.761)	**5129**(**5129.00**)	23.739(23.739)	4828	36000.000(1244.040)
hamming6-2	1072(1072.00)	<**0.001**(<**0.001**)	1072(1072.00)	<**0.001**(<**0.001**)	1072(1072.00)	<**0.001**(<**0.001**)	1072(1072.00)	<**0.001** (<**0.001**)	1072(1072.00)	0.358(0.358)	1072	0.100(0.100)

Table 2: Experimental results on DIMACS benchmark- Part II.

Graph	PbO-MWC		MN/TS		LSCC		LSCC+BMS		RRWL		TSM-MWC	
	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	$w_{max}(w_{avg})$	t_{avg}	w_{sol}	$time$
hamming6-4	134(134.00)	**<0.001(<0.001)**	134(134.00)	**<0.001(<0.001)**	134(134.00)	**<0.001(<0.001)**	134(134.00)	**<0.001(<0.001)**	134(134.00)	0.364(0.364)	134	0.090(0.090)
hamming8-2	10976(10976.00)	0.016(0.016)	10976(10976.00)	**0.005(0.005)**	10976(10976.00)	0.016(0.016)	10976(10976.00)	0.008(0.008)	10976(10976.00)	0.406(0.406)	10976	0.480(0.480)
hamming8-4	1472(1472.00)	**<0.001(<0.001)**	1472(1472.00)	**<0.001(<0.001)**	1472(1472.00)	0.001(0.001)	1472(1472.00)	**<0.001(<0.001)**	1472(1472.00)	0.361(0.361)	1472	0.090(0.090)
johnson16-2-4	548(548.00)	**<0.001(<0.001)**	548(548.00)	0.583(0.583)	548(548.00)	0.251(0.251)	548(548.00)	0.269(0.269)	548(548.00)	0.345(0.345)	548	0.090(0.090)
johnson8-2-4	66(66.00)	**<0.001(<0.001)**	66(66.00)	**<0.001(<0.001)**	66(66.00)	**<0.001(<0.001)**	66(66.00)	**<0.001(<0.001)**	66(66.00)	0.341(0.341)	66	0.090(0.090)
johnson8-4-4	511(511.00)	**<0.001(<0.001)**	511(511.00)	**<0.001(<0.001)**	511(511.00)	**<0.001(<0.001)**	511(511.00)	**<0.001(<0.001)**	511(511.00)	0.336(0.336)	511	0.090(0.090)
keller4	1153(1153.00)	**<0.001(<0.001)**	1153(1153.00)	**<0.001(<0.001)**	1153(1153.00)	0.022(0.022)	1153(1153.00)	0.016(0.016)	1153(1153.00)	0.361(0.361)	1153	0.190(0.190)
keller5	**3317(3317.00)**	**0.080(0.080)**	**3317(3317.00)**	0.245(0.245)	**3317(3317.00)**	15.977(15.977)	**3317(3317.00)**	18.548(18.548)	**3317(3317.00)**	6.088(6.088)	3097	36000.000(3472.040)
keller6	**8062(8062.00)**	**20.836(20.836)**	**8062(8062.00)**	509.848(509.848)	**8062**(7858.60)	35329.291(1729.344)	**8062**(7862.85)	35648.146(1895.647)	**8062**(7892.65)	35672.589(1633.382)	4793	36000.000(3564.280)
p_hat1000-1	1514(1514.00)	**0.006(0.006)**	1514(1514.00)	0.015(0.015)	1514(1514.00)	0.799(0.799)	1514(1514.00)	0.813(0.813)	1514(1514.00)	0.443(0.443)	1514	0.390(0.390)
p_hat1000-2	5777(5777.00)	0.018(0.018)	5777(5777.00)	**0.010(0.010)**	5777(5777.00)	0.117(0.117)	5777(5777.00)	0.115(0.115)	5777(5777.00)	0.470(0.470)	5777	1.280(1.280)
p_hat1000-3	8111(8111.00)	0.098(0.098)	8111(8111.00)	**0.063(0.063)**	8111(8111.00)	2.253(2.253)	8111(8111.00)	2.381(2.381)	8111(8111.00)	0.841(0.841)	8111	625.470(625.470)
p_hat1500-1	1619(1619.00)	0.062(0.062)	1619(1619.00)	**0.035(0.035)**	1619(1619.00)	0.068(0.068)	1619(1619.00)	0.046(0.046)	1619(1619.00)	0.581(0.581)	1619	1.110(1.110)
p_hat1500-2	7360(7360.00)	**0.183(0.183)**	7360(7360.00)	0.193(0.193)	7360(7360.00)	1.101(1.101)	7360(7360.00)	1.120(1.120)	7360(7360.00)	0.747(0.747)	7360	10.080(10.080)
p_hat300-1	1057(1057.00)	**<0.001(<0.001)**	1057(1057.00)	**<0.001(<0.001)**	1057(1057.00)	**<0.001(<0.001)**	1057(1057.00)	**<0.001(<0.001)**	1057(1057.00)	0.379(0.379)	1057	0.090(0.090)
p_hat300-2	2487(2487.00)	**<0.001(<0.001)**	2487(2487.00)	**<0.001(<0.001)**	2487(2487.00)	0.003(0.003)	2487(2487.00)	0.002(0.002)	2487(2487.00)	0.400(0.400)	2487	0.100(0.100)
p_hat300-3	3774(3774.00)	**<0.001(<0.001)**	3774(3774.00)	**<0.001(<0.001)**	3774(3774.00)	0.016(0.016)	3774(3774.00)	0.013(0.013)	3774(3774.00)	0.401(0.401)	3774	0.290(0.290)
p_hat500-1	1231(1231.00)	**<0.001(<0.001)**	1231(1231.00)	**<0.001(<0.001)**	1231(1231.00)	**<0.001(<0.001)**	1231(1231.00)	**<0.001(<0.001)**	1231(1231.00)	0.402(0.402)	1231	0.190(0.190)
p_hat500-2	3920(3920.00)	**<0.001(<0.001)**	3920(3920.00)	**<0.001(<0.001)**	3920(3920.00)	0.037(0.037)	3920(3920.00)	0.028(0.028)	3920(3920.00)	0.412(0.412)	3920	0.190(0.190)
p_hat500-3	5375(5375.00)	**0.002(0.002)**	5375(5375.00)	**0.002(0.002)**	5375(5375.00)	0.225(0.225)	5375(5375.00)	0.227(0.227)	5375(5375.00)	0.432(0.432)	5375	2.590(2.590)
p_hat700-1	1441(1441.00)	**<0.001(<0.001)**	1441(1441.00)	0.002(0.002)	1441(1441.00)	0.046(0.046)	1441(1441.00)	0.040(0.040)	1441(1441.00)	0.412(0.412)	1441	0.190(0.190)
p_hat700-2	5290(5290.00)	0.002(0.002)	5290(5290.00)	**<0.001(<0.001)**	5290(5290.00)	0.016(0.016)	5290(5290.00)	0.011(0.011)	5290(5290.00)	0.423(0.423)	5290	0.190(0.190)
p_hat700-3	7565(7565.00)	**0.027(0.027)**	7565(7565.00)	0.035(0.035)	7565(7565.00)	1.831(1.831)	7565(7565.00)	1.889(1.889)	7565(7565.00)	0.667(0.667)	7565	0.690(0.690)
san1000	1716(1716.00)	**0.573(0.573)**	1716(1716.00)	7.871(7.871)	1716(1716.00)	656.871(656.871)	1716(1716.00)	90.903(90.903)	1716(1716.00)	14.471(14.471)	1716	5.580(5.580)
san200_0.7_1	3370(3370.00)	**0.001(0.001)**	3370(3370.00)	0.026(0.026)	3370(3370.00)	0.006(0.006)	3370(3370.00)	0.006(0.006)	3370(3370.00)	0.406(0.406)	3370	0.190(0.190)
san200_0.7_2	2422(2422.00)	**<0.001(<0.001)**	2422(2422.00)	**<0.001(<0.001)**	2422(2422.00)	**<0.001(<0.001)**	2422(2422.00)	**<0.001(<0.001)**	2422(2422.00)	0.395(0.395)	2422	0.090(0.090)
san200_0.9_1	6825(6825.00)	0.507(0.507)	6825(6825.00)	0.237(0.237)	6825(6825.00)	0.315(0.315)	6825(6825.00)	0.361(0.361)	6825(6825.00)	0.443(0.443)	6825	**0.190(0.190)**
san200_0.9_2	6082(6082.00)	**0.010(0.010)**	6082(6082.00)	0.048(0.048)	6082(6082.00)	0.041(0.041)	6082(6082.00)	0.037(0.037)	6082(6082.00)	0.394(0.394)	6082	0.290(0.290)
san200_0.9_3	4748(4748.00)	**<0.001(<0.001)**	4748(4748.00)	**<0.001(<0.001)**	4748(4748.00)	0.016(0.016)	4748(4748.00)	0.011(0.011)	4748(4748.00)	0.392(0.392)	4748	1.890(1.890)
san400_0.5_1	1455(1455.00)	0.008(0.008)	1455(1455.00)	**0.004(0.004)**	1455(1455.00)	0.065(0.065)	1455(1455.00)	0.499(0.499)	1455(1455.00)	0.444(0.444)	1455	0.390(0.390)
san400_0.7_1	3941(3941.00)	43.140(43.140)	3941(3941.00)	42.184(42.184)	3941(3941.00)	62.246(62.246)	3941(3941.00)	88.384(88.384)	3941(3941.00)	7.087(7.087)	3941	**1.490(1.490)**
san400_0.7_2	3110(3110.00)	125.663(125.663)	3110(3110.00)	75.019(75.019)	3110(3110.00)	197.050(197.050)	3110(3110.00)	223.260(223.260)	3110(3110.00)	15.661(15.661)	3110	**3.890(3.890)**
san400_0.7_3	2771(2771.00)	**0.008(0.008)**	2771(2771.00)	0.089(0.089)	2771(2771.00)	7.880(7.880)	2771(2771.00)	2.286(2.286)	2771(2771.00)	1.606(1.606)	2771	1.110(1.110)
sanr200_0.7	2325(2325.00)	**<0.001(<0.001)**	2325(2325.00)	**<0.001(<0.001)**	2325(2325.00)	0.012(0.012)	2325(2325.00)	0.010(0.010)	2325(2325.00)	0.386(0.386)	2325	0.290(0.290)
sanr200_0.9	5126(5126.00)	**<0.001(<0.001)**	5126(5126.00)	**<0.001(<0.001)**	5126(5126.00)	0.002(0.002)	5126(5126.00)	0.001(0.001)	5126(5126.00)	0.388(0.388)	5126	1.490(1.490)
sanr400_0.5	1835(1835.00)	**<0.001(<0.001)**	1835(1835.00)	**<0.001(<0.001)**	1835(1835.00)	0.060(0.060)	1835(1835.00)	0.048(0.048)	1835(1835.00)	0.418(0.418)	1835	0.190(0.190)
sanr400_0.7	2992(2992.00)	**<0.001(<0.001)**	2992(2992.00)	**<0.001(<0.001)**	2992(2992.00)	0.007(0.007)	2992(2992.00)	0.002(0.002)	2992(2992.00)	0.407(0.407)	2992	18.890(18.890)

Table 3: Experimental results on KES benchmark.

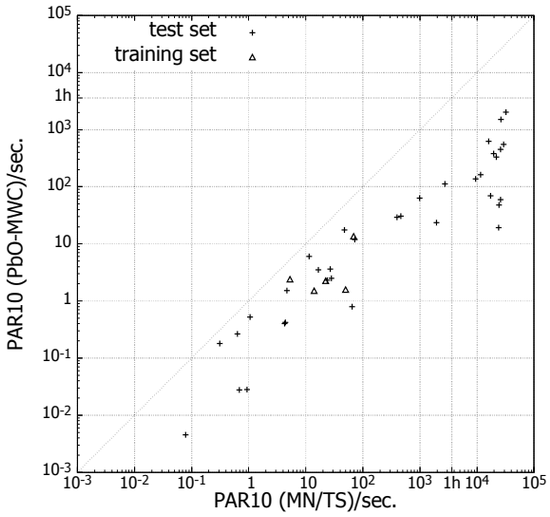
Graph	*sol best*	PbO-MWC		MN/TS		LSCC		LSCC+BMS		RRWL		TSM-MWC	
		suc rate	(t_{avg}) $PAR10$	*suc rate*	(t_{avg}) $PAR10$	*suc rate*	(t_{avg}) $PAR10$	*suc rate*	(t_{avg}) $PAR10$	*suc rate*	(t_{avg}) $PAR10$	*suc rate*	(*time*) $PAR10$
083	1237688860685	100	(**0.902**) **0.902**	100	(76.022) 76.022	100	(73.769) 73.769	100	(93.026) 93.026	100	(142.617) 142.617	100	(162.390) 162.390
084	1100166012937	100	(**0.470**) **0.470**	100	(170.961) 170.961	100	(5.882) 5.882	100	(12.575) 12.575	100	(10.478) 10.478	100	(189.200) 189.200
091	1306441900046	**100**	(**3.424**) **3.424**	90	(1274.412) 4767.636	**100**	(267.249) 267.249	86	(1148.002) 6079.333	**100**	(348.165) 348.165	0	(112.590) 36000.000
096	1375094325251	**100**	(**1.590**) **1.590**	13	(271.969) 31490.534	**100**	(272.134) 272.134	85	(959.731) 6352.636	**100**	(440.349) 440.349	0	(6.290) 36000.000
097	1375144632330	**100**	(**2.014**) **2.014**	3	(507.525) 34979.451	**100**	(414.291) 414.291	82	(1196.935) 7570.461	73	(1052.616) 10654.982	0	(744.600) 36000.000
105	1787797020693	**100**	(**8.890**) **8.890**	92	(1073.198) 3890.683	74	(1363.477) 10602.293	70	(1293.008) 11940.049	43	(1177.404) 21259.329	0	(119.590) 36000.000
107	1650240659468	**100**	(**4.670**) **4.670**	95	(1011.776) 2737.816	78	(1196.789) 8912.339	52	(1548.089) 18180.153	41	(1312.153) 21898.167	0	(148.390) 36000.000
114	2406557630478	**100**	(**16.172**) **16.172**	0	(1535.306) 36000.000	2	(1590.658) 35318.849	2	(1693.137) 35306.974	2	(1776.499) 35335.845	0	(1671.880) 36000.000
116	2131511910416	**100**	(**5.202**) **5.202**	0	(1383.749) 36000.000	82	(1110.178) 7464.405	68	(1349.423) 12486.060	38	(1491.430) 22810.138	0	(414.780) 36000.000
119	2269068296209	**100**	(**4.908**) **4.908**	3	(1220.001) 34957.335	**100**	(679.383) 679.383	99	(743.593) 1091.712	75	(1281.739) 9964.896	0	(488.960) 36000.000
071	1306458693642	100	(**0.307**) **0.307**	100	(0.506) 0.506	100	(3.692) 3.692	100	(2.532) 2.532	100	(10.101) 10.101	100	(194.990) 194.990
073	1237638553607	100	(0.182) 0.182	100	(**0.166**) **0.166**	100	(0.855) 0.855	100	(0.573) 0.573	100	(2.911) 2.911	100	(1896.270) 1896.270
074	756484685838	100	(**0.092**) **0.092**	100	(0.105) 0.105	100	(0.877) 0.877	100	(0.606) 0.606	100	(1.640) 1.640	100	(0.490) 0.490
081	1650240634895	**100**	(**2.005**) **2.005**	42	(952.869) 21578.965	92	(928.713) 3789.622	98	(1004.306) 1721.167	51	(1255.399) 18564.740	0	(994.070) 36000.000
082	1443914440714	**100**	(**2.438**) **2.438**	0	(1454.161) 36000.000	**100**	(52.113) 52.113	**100**	(52.100) 52.100	**100**	(96.197) 96.197	**100**	(601.480) 601.480
085	1100216320013	100	(**1.108**) **1.108**	100	(3.232) 3.232	100	(33.098) 33.098	100	(63.250) 63.250	100	(71.106) 71.106	100	(14.990) 14.990
086	893940432911	100	(0.390) 0.390	100	(**0.387**) **0.387**	100	(3.391) 3.391	100	(1.991) 1.991	100	(5.186) 5.186	100	(427.190) 427.190
087	1375194939405	100	(**1.170**) **1.170**	100	(3.583) 3.583	100	(50.560) 50.560	100	(34.520) 34.520	100	(171.926) 171.926	100	(8.060) 8.060
088	1375211708430	100	(**0.805**) **0.805**	100	(0.840) 0.840	100	(5.799) 5.799	100	(7.199) 7.199	100	(8.428) 8.428	100	(666.430) 666.430
089	893940457482	100	(**0.316**) **0.316**	100	(7.763) 7.763	100	(59.544) 59.544	100	(52.238) 52.238	100	(75.254) 75.254	100	(0.790) 0.790
092	1581403750408	**100**	(**1.716**) **1.716**	0	(1159.796) 36000.000	**100**	(544.064) 544.064	93	(1182.126) 3601.089	85	(1183.945) 6467.613	**100**	(5.690) 5.690
093	1031496818707	100	(1.516) 1.516	100	(**1.302**) **1.302**	100	(6.535) 6.535	100	(3.934) 3.934	100	(7.124) 7.124	100	(119.150) 119.150
094	1031547150353	100	(**1.154**) **1.154**	100	(2.025) 2.025	100	(106.281) 106.281	100	(49.779) 49.779	100	(137.152) 137.152	100	(77.780) 77.780
095	1375245246480	**100**	(**2.995**) **2.995**	**100**	(48.995) 48.995	**100**	(192.375) 192.375	**100**	(432.595) 432.595	**100**	(418.615) 418.615	0	(14.880) 36000.000
098	1443947978765	100	(**1.182**) **1.182**	100	(8.000) 8.000	100	(13.263) 13.263	100	(11.132) 11.132	100	(21.734) 21.734	100	(501.780) 501.780
099	1237722398735	**100**	(**1.867**) **1.867**	**100**	(11.295) 11.295	**100**	(18.543) 18.543	**100**	(19.415) 19.415	**100**	(38.765) 38.765	0	(974.380) 36000.000
100	1512701018124	**100**	(**1.600**) **1.600**	21	(524.223) 28761.030	**100**	(185.291) 185.291	**100**	(230.710) 230.710	**100**	(515.888) 515.888	0	(13.090) 36000.000
101	1650207096842	**100**	(**4.780**) **4.780**	0	(1246.877) 36000.000	83	(1174.490) 7146.935	23	(1066.035) 28131.421	68	(1473.039) 12578.383	**100**	(20.390) 20.390
102	1718960136202	**100**	(**2.594**) **2.594**	30	(623.679) 25650.273	**100**	(92.241) 92.241	95	(824.607) 2613.607	**100**	(236.558) 236.558	0	(132.650) 36000.000
103	1512701018125	**100**	(**3.731**) **3.731**	38	(668.578) 22888.180	**100**	(62.515) 62.515	**100**	(109.763) 109.763	**100**	(82.190) 82.190	0	(34.780) 36000.000
104	1512818425875	**100**	(**4.847**) **4.847**	40	(1647.883) 22257.659	78	(1141.392) 8965.691	74	(1244.486) 10459.170	18	(1163.635) 29872.477	0	(1162.670) 36000.000
106	1375228477454	**100**	(**2.639**) **2.639**	**100**	(140.282) 140.282	**100**	(821.318) 821.318	97	(1034.791) 2094.082	76	(1485.375) 9818.211	0	(10.090) 36000.000
108	1581487595537	**100**	(**5.359**) **5.359**	99	(450.271) 792.348	99	(657.236) 1010.718	85	(1129.557) 6352.178	95	(1050.945) 2830.792	0	(32.390) 36000.000
109	1718976905230	**100**	(**3.756**) **3.756**	1	(1306.312) 35658.641	**100**	(551.843) 551.843	59	(1248.325) 15520.093	88	(1310.915) 5477.731	0	(3352.550) 36000.000
110	1512768094224	**100**	(**3.861**) **3.861**	**100**	(391.202) 391.202	**100**	(15.364) 15.364	**100**	(13.357) 13.357	**100**	(17.000) 17.000	0	(2269.480) 36000.000
111	2544013377548	**100**	(**46.758**) **46.758**	0	(1567.153) 36000.000	1	(1567.423) 35642.751	0	(1808.095) 36000.000	0	(1519.593) 36000.000	0	(98.890) 36000.000
112	2475277107217	**100**	(**28.581**) **28.581**	0	(1749.538) 36000.000	5	(1692.161) 34292.508	0	(1550.411) 36000.000	0	(1652.289) 36000.000	0	(3593.620) 36000.000
113	2200298487823	**100**	(**8.528**) **8.528**	0	(1556.683) 36000.000	13	(1357.006) 31533.985	16	(1540.398) 30467.412	3	(1510.060) 34950.790	**100**	(48.390) 48.390
115	1581588209685	**100**	(**10.390**) **10.390**	2	(1787.766) 35321.865	30	(1404.084) 25663.611	87	(1038.877) 5602.608	33	(1581.393) 24769.977	0	(3150.560) 36000.000
117	1925303123981	**100**	(**7.240**) **7.240**	0	(1474.054) 36000.000	97	(1214.428) 2267.166	79	(1456.617) 8760.884	64	(1177.945) 13821.927	0	(974.580) 36000.000
118	2406641475604	**100**	(**15.832**) **15.832**	0	(1670.186) 36000.000	0	(1715.431) 36000.000	0	(1591.963) 36000.000	0	(1529.837) 36000.000	**100**	(1443.190) 1443.190
120	2337821335572	**100**	(**12.905**) **12.905**	0	(1433.344) 36000.000	19	(1570.731) 29459.416	4	(1409.346) 34591.197	3	(1737.625) 34947.152	0	(162.680) 36000.000

Table 4: Experimental results on REF benchmark.

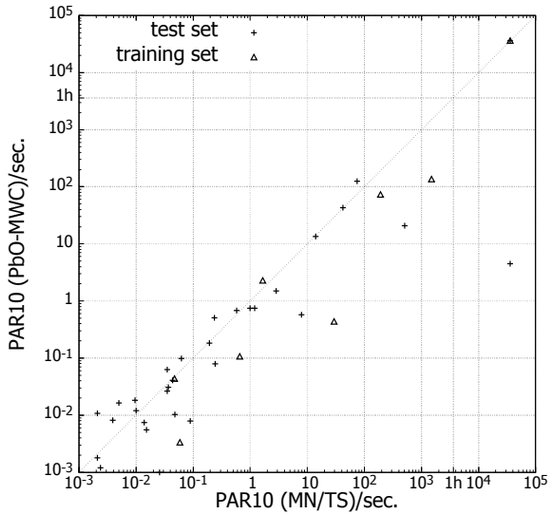
Graph	$sol\ best$	PbO-MWC		MN/TS		LSCC		LSCC+BMS		RRWL		TSM-MWC	
		$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	(t_{avg}) $PAR10$	$suc\ rate$	$(time)$ $PAR10$
ref-60-1000	743	100	(2.568) 2.568	100	(**0.096**) **0.096**	100	(2.604) 2.604	100	(2.815) 2.815	100	(3.587) 3.587	100	(277.880) 277.880
ref-60-230-0	506	**100**	(**60.992**) **60.992**	87	(1045.383) 5725.273	0	(770.114) 36000.000	0	(758.782) 36000.000	0	(1240.335) 36000.000	0	(2477.980) 36000.000
ref-60-500-7	700	**100**	(**5.895**) **5.895**	**100**	(58.170) 58.170	2	(57.438) 35312.965	2	(76.478) 35309.344	0	(39.422) 36000.000	0	(399.550) 36000.000
ref-10-20	49	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(0.361) 0.361	100	(0.000) **0.000**
ref-10-30	69	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(0.367) 0.367	100	(0.000) **0.000**
ref-10-40	93	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(0.360) 0.360	100	(0.000) **0.000**
ref-10-50	102	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(**0.000**) **0.000**	100	(0.368) 0.368	100	(0.000) **0.000**
ref-30-50	139	100	(0.001) 0.001	100	(**0.000**) **0.000**	100	(0.019) 0.019	100	(0.013) 0.013	100	(0.458) 0.458	100	(0.000) **0.000**
ref-60-10000	768	100	(0.193) 0.193	100	(**0.032**) **0.032**	100	(0.097) 0.097	100	(0.118) 0.118	100	(0.527) 0.527	100	(12.890) 12.890
ref-60-230-1	506	**100**	(76.756) 76.756	**100**	(**52.042**) **52.042**	2	(259.120) 35307.274	0	(201.255) 36000.000	0	(992.196) 36000.000	0	(830.790) 36000.000
ref-60-230-2	524	**100**	(**0.100**) **0.100**	**100**	(0.249) 0.249	**100**	(337.901) 337.901	**100**	(260.969) 260.969	98	(629.556) 1345.390	0	(3054.720) 36000.000
ref-60-230-3	502	**100**	(**0.139**) **0.139**	**100**	(0.244) 0.244	**100**	(173.394) 173.394	**100**	(194.756) 194.756	97	(800.821) 1876.923	0	(1781.070) 36000.000
ref-60-230-4	504	**100**	(**0.186**) **0.186**	**100**	(0.712) 0.712	98	(855.686) 1570.613	**100**	(499.303) 499.303	61	(1091.397) 14829.907	0	(1511.560) 36000.000
ref-60-230-5	503	**100**	(**0.232**) **0.232**	**100**	(0.339) 0.339	**100**	(362.522) 362.522	**100**	(429.003) 429.003	82	(1048.387) 7523.509	0	(128.590) 36000.000
ref-60-230-6	505	**100**	(0.094) 0.094	**100**	(**0.091**) **0.091**	**100**	(135.267) 135.267	**100**	(79.723) 79.723	**100**	(548.991) 548.991	0	(3351.150) 36000.000
ref-60-230-7	506	**100**	(**2.442**) **2.442**	**100**	(6.780) 6.780	14	(432.156) 31165.753	15	(429.282) 30875.976	3	(936.927) 34972.629	0	(2569.800) 36000.000
ref-60-230-8	494	**100**	(**0.155**) **0.155**	**100**	(0.310) 0.310	**100**	(355.894) 355.894	**100**	(364.748) 364.748	93	(1022.198) 3533.538	0	(1219.250) 36000.000
ref-60-230-9	526	**100**	(**0.684**) **0.684**	**100**	(2.677) 2.677	98	(1065.225) 1784.445	**100**	(599.256) 599.256	61	(1003.228) 14866.391	0	(44.490) 36000.000
ref-60-300	599	**100**	(**0.115**) **0.115**	**100**	(0.232) 0.232	**100**	(183.132) 183.132	**100**	(103.767) 103.767	99	(708.523) 1066.496	0	(3567.480) 36000.000
ref-60-500-0	704	**100**	(**61.185**) **61.185**	48	(735.908) 19440.684	0	(353.410) 36000.000	0	(121.051) 36000.000	0	(325.049) 36000.000	0	(3552.830) 36000.000
ref-60-500-1	709	**100**	(**0.086**) **0.086**	**100**	(0.090) 0.090	**100**	(9.942) 9.942	**100**	(3.448) 3.448	**100**	(11.789) 11.789	0	(908.640) 36000.000
ref-60-500-2	702	**100**	(**0.803**) **0.803**	**100**	(12.230) 12.230	4	(145.902) 34607.384	3	(155.079) 35008.843	1	(254.645) 35645.912	0	(68.080) 36000.000
ref-60-500-3	716	**100**	(0.082) 0.082	**100**	(**0.044**) **0.044**	**100**	(2.740) 2.740	**100**	(0.819) 0.819	**100**	(2.881) 2.881	0	(14.090) 36000.000
ref-60-500-4	690	**100**	(**0.255**) **0.255**	**100**	(0.727) 0.727	**100**	(339.175) 339.175	**100**	(109.800) 109.800	**100**	(804.839) 804.839	0	(500.710) 36000.000
ref-60-500-5	714	**100**	(0.090) 0.090	**100**	(**0.059**) **0.059**	**100**	(6.718) 6.718	**100**	(1.985) 1.985	**100**	(4.965) 4.965	0	(244.470) 36000.000
ref-60-500-6	715	**100**	(0.112) 0.112	**100**	(**0.089**) **0.089**	**100**	(8.521) 8.521	**100**	(6.583) 6.583	**100**	(18.712) 18.712	0	(3161.160) 36000.000
ref-60-500-8	714	**100**	(**0.094**) **0.094**	**100**	(0.100) 0.100	**100**	(286.912) 286.912	**100**	(123.516) 123.516	**100**	(850.038) 850.038	0	(411.690) 36000.000
ref-60-500-9	704	**100**	(**1.281**) **1.281**	**100**	(5.372) 5.372	17	(366.494) 30190.478	47	(905.199) 19945.703	9	(204.615) 32913.313	0	(642.830) 36000.000
ref-60-500	704	**100**	(**0.402**) **0.402**	**100**	(0.940) 0.940	**100**	(141.320) 141.320	**100**	(81.310) 81.310	**100**	(59.510) 59.510	0	(2790.890) 36000.000

Table 5: Experimental results on all benchmarks.

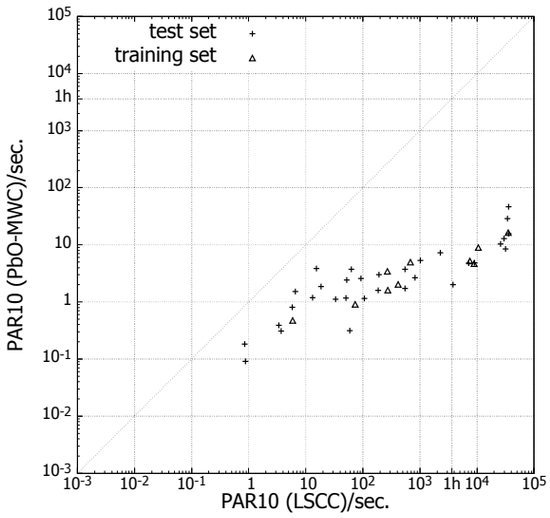
Benchmark	Num	PbO-MWC $avg\ PAR10$	MN/TS $avg\ PAR10$	LSCC $avg\ PAR10$	LSCC+BMS $avg\ PAR10$	RRWL $avg\ PAR10$	TSM-MWC $avg\ PAR10$
BHOSLIB	40	**167.435**	7234.972	18707.556	19151.201	18743.424	32519.003
DIMACS	80	**905.301**	1379.709	1885.051	1897.256	1770.183	5113.066
KES	42	**5.497**	16728.550	6728.632	8526.514	10163.870	20723.301
REF	29	**7.412**	872.675	8423.623	8000.062	10168.337	27320.371



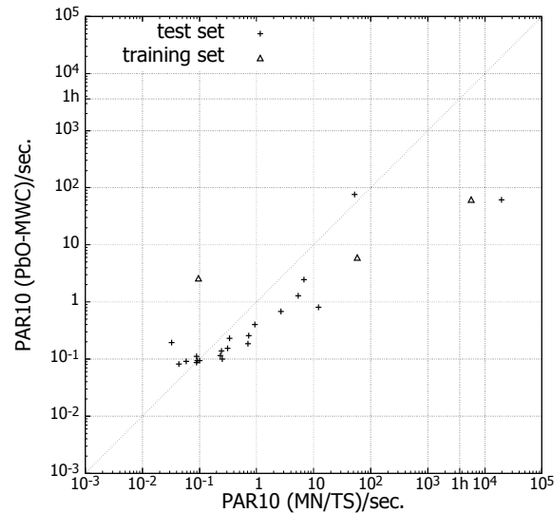
(a) Scatter plots corresponding to the performance comparison between PbO-MWC and MN/TS on BHOSLIB.



(b) Scatter plots corresponding to the performance comparison between PbO-MWC and MN/TS on DIMACS.



(c) Scatter plots corresponding to the performance comparison between PbO-MWC and LSCC on KES.



(d) Scatter plots corresponding to the performance comparison between PbO-MWC and MN/TS on REF.

Figure 1: Scatter plots of PAR10 between PbO-MWC and the best competitor on four benchmarks. (1h (3600 seconds) is the cutoff time of each run.)