

Computational results for Beasley's medium problems. Option: k = 4, p = 5, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	950608.43	950608.43	950608.43	0.043	0.000	0.000	0.000
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950608.43	950608.43	950608.43	0.004	0.000	0.000	0.000
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.33	851495.33	851495.33	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.000	0.000	0.000

Computational results for Beasley's medium problems. Option: k = 4, p = 10, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	951462.55	951462.55	951462.55	0.043	0.090	0.090	0.090
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950644.44	950644.44	950644.44	0.004	0.004	0.004	0.004
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.32	851495.32	851495.32	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.004	0.004	0.004

Time (sec.)s and best restarts for Beasley's medium problems. k = 4, r = 30

Pr. No.	Time (sec.)						Best Restart					
	p=5			p=10			p=5			p=10		
	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	0.55	0.55	0.54	0.94	0.94	0.94	2	2	2	2	2	2
cap62	0.57	0.57	0.56	0.75	0.76	0.75	2	2	2	2	2	2
cap63	0.88	0.89	0.88	1.49	1.48	1.49	2	2	2	1	1	1
cap64	1.57	1.59	1.58	2.02	2.14	2.15	4	4	4	8	13	13
cap71	0.01	0.01	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap72	0.02	0.02	0.02	0.02	0.03	0.03	0	0	0	0	0	0
cap73	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap74	0.02	0.02	0.02	0.04	0.03	0.03	0	0	0	0	0	0
cap91	1.40	1.39	1.40	1.34	1.33	1.34	2	2	2	1	1	1
cap92	1.17	1.16	1.19	1.08	1.08	1.08	2	2	2	5	5	5
cap93	1.35	1.35	1.34	1.44	1.42	1.44	3	3	3	5	5	5
cap94	4.13	4.13	4.12	4.08	4.09	4.09	9	9	9	1	1	1
cap101	0.04	0.03	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap102	0.04	0.04	0.04	0.06	0.06	0.06	0	0	0	0	0	0
cap103	0.05	0.04	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap104	0.03	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap121	4.24	4.23	4.24	4.70	4.68	4.71	2	2	2	2	2	2
cap122	2.51	2.51	2.52	2.73	2.73	2.72	3	3	3	3	3	3
cap123	3.40	3.38	3.39	3.50	3.51	3.50	15	15	15	1	1	1
cap124	8.06	8.06	8.08	8.63	8.59	8.62	27	27	27	2	2	2
cap131	0.07	0.07	0.07	0.09	0.09	0.10	0	0	0	0	0	0
cap132	0.09	0.09	0.09	0.10	0.10	0.10	0	0	0	0	0	0
cap133	0.11	0.11	0.11	0.11	0.11	0.11	0	0	0	0	0	0
cap134	0.11	0.11	0.10	0.09	0.09	0.10	0	0	0	0	0	0
Avg.	1.27	1.27	1.27	1.39	1.40	1.40						

Computational results for Beasley's medium problems. Option: k = 5, p = 5, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	950608.43	950608.43	950608.43	0.043	0.000	0.000	0.000
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950608.43	950608.43	950608.43	0.004	0.000	0.000	0.000
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.33	851495.33	851495.33	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.000	0.000	0.000

Computational results for Beasley's medium problems. Option: k = 5, p = 10, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	951462.55	951462.55	951462.55	0.043	0.090	0.090	0.090
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950644.44	950644.44	950644.44	0.004	0.004	0.004	0.004
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.32	851495.32	851495.32	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.004	0.004	0.004

Time (sec.)s and best restarts for Beasley's medium problems. k = 5, r = 30

Pr. No.	Time (sec.)						Best Restart					
	p=5			p=10			p=5			p=10		
	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	0.55	0.55	0.55	0.95	0.94	0.94	2	2	2	2	2	2
cap62	0.52	0.52	0.52	0.70	0.69	0.69	2	2	2	4	4	4
cap63	0.78	0.79	0.79	1.34	1.33	1.34	1	1	1	1	1	1
cap64	1.24	1.23	1.24	1.66	1.74	1.75	2	2	2	1	7	7
cap71	0.02	0.02	0.01	0.04	0.03	0.03	0	0	0	0	0	0
cap72	0.02	0.02	0.02	0.02	0.02	0.02	0	0	0	0	0	0
cap73	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap74	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap91	1.40	1.40	1.40	1.30	1.31	1.30	2	2	2	1	1	1
cap92	1.13	1.14	1.14	1.08	1.07	1.08	4	4	4	5	5	5
cap93	1.45	1.45	1.45	1.54	1.55	1.55	3	3	3	5	5	5
cap94	3.80	3.83	3.81	4.09	4.09	4.10	9	9	9	1	1	1
cap101	0.04	0.04	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap102	0.04	0.04	0.04	0.06	0.06	0.06	0	0	0	0	0	0
cap103	0.05	0.04	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap104	0.03	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap121	5.08	5.07	5.07	5.77	5.74	5.76	2	2	2	2	2	2
cap122	2.54	2.54	2.54	2.69	2.70	2.70	7	7	7	3	3	3
cap123	3.01	3.01	3.01	3.37	3.37	3.38	15	15	15	10	10	10
cap124	8.25	8.27	8.22	8.82	8.76	8.81	25	25	25	2	2	2
cap131	0.07	0.07	0.07	0.09	0.09	0.10	0	0	0	0	0	0
cap132	0.09	0.09	0.09	0.10	0.10	0.10	0	0	0	0	0	0
cap133	0.11	0.12	0.11	0.11	0.11	0.11	0	0	0	0	0	0
cap134	0.11	0.10	0.11	0.10	0.10	0.10	0	0	0	0	0	0
Avg.	1.27	1.27	1.26	1.42	1.42	1.42						

Computational results for Beasley's medium problems. Option: k = 6, p = 5, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	950608.43	950608.43	950608.43	0.043	0.000	0.000	0.000
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950608.43	950608.43	950608.43	0.004	0.000	0.000	0.000
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.33	851495.33	851495.33	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.000	0.000	0.000

Computational results for Beasley's medium problems. Option: k = 6, p = 10, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	951462.55	951462.55	951462.55	0.043	0.090	0.090	0.090
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950644.44	950644.44	950644.44	0.004	0.004	0.004	0.004
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.32	851495.32	851495.32	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.004	0.004	0.004

Time (sec.)s and best restarts for Beasley's medium problems. k = 6, r = 30

Pr. No.	Time (sec.)						Best Restart					
	p=5			p=10			p=5			p=10		
	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	0.55	0.55	0.55	0.94	0.94	0.94	2	2	2	2	2	2
cap62	0.52	0.51	0.52	0.66	0.66	0.66	4	4	4	4	4	4
cap63	0.84	0.83	0.83	1.34	1.34	1.34	9	9	9	12	12	12
cap64	1.13	1.15	1.15	1.72	1.77	1.78	2	2	2	1	7	7
cap71	0.02	0.02	0.01	0.03	0.03	0.03	0	0	0	0	0	0
cap72	0.02	0.02	0.02	0.02	0.02	0.02	0	0	0	0	0	0
cap73	0.02	0.03	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap74	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap91	1.33	1.33	1.33	1.20	1.20	1.20	2	2	2	1	1	1
cap92	1.08	1.09	1.08	1.07	1.08	1.07	10	10	10	9	9	9
cap93	1.48	1.47	1.46	1.60	1.60	1.60	3	3	3	5	5	5
cap94	4.01	4.02	4.01	4.10	4.10	4.09	9	9	9	1	1	1
cap101	0.03	0.04	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap102	0.04	0.04	0.04	0.06	0.06	0.06	0	0	0	0	0	0
cap103	0.05	0.04	0.05	0.05	0.05	0.05	0	0	0	0	0	0
cap104	0.03	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap121	4.83	4.81	4.80	5.27	5.27	5.28	2	2	2	2	2	2
cap122	2.46	2.46	2.46	2.64	2.65	2.64	7	7	7	3	3	3
cap123	3.01	3.00	2.99	3.33	3.37	3.37	15	15	15	1	1	1
cap124	8.29	8.28	8.38	8.93	8.96	18.84	25	25	25	2	2	2
cap131	0.07	0.07	0.07	0.09	0.09	0.09	0	0	0	0	0	0
cap132	0.09	0.09	0.09	0.10	0.10	0.10	0	0	0	0	0	0
cap133	0.11	0.11	0.11	0.11	0.11	0.11	0	0	0	0	0	0
cap134	0.11	0.11	0.11	0.10	0.10	0.10	0	0	0	0	0	0
Avg.	1.25	1.25	1.26	1.40	1.40	1.81						

Computational results for Beasley's medium problems. Option: k = 7, p = 5, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	950608.43	950608.43	950608.43	0.043	0.000	0.000	0.000
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950608.43	950608.43	950608.43	0.004	0.000	0.000	0.000
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.33	851495.33	851495.33	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.000	0.000	0.000

Computational results for Beasley's medium problems. Option: k = 7, p = 10, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	951462.55	951462.55	951462.55	0.043	0.090	0.090	0.090
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950644.44	950644.44	950644.44	0.004	0.004	0.004	0.004
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.32	851495.32	851495.32	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.004	0.004	0.004

Time (sec.)s and best restarts for Beasley's medium problems. k = 7, r = 30

Pr. No.	Time (sec.)						Best Restart					
	p=5			p=10			p=5			p=10		
	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	0.55	0.55	0.55	0.94	0.94	0.94	2	2	2	2	2	2
cap62	0.46	0.46	0.46	0.63	0.62	0.62	12	12	12	5	5	5
cap63	0.73	0.74	0.73	1.22	1.22	1.21	6	6	6	28	28	28
cap64	1.04	1.04	1.05	1.63	1.73	1.70	1	1	1	1	8	8
cap71	0.01	0.01	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap72	0.01	0.02	0.02	0.02	0.02	0.02	0	0	0	0	0	0
cap73	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap74	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap91	1.34	1.35	1.33	1.21	1.20	1.21	2	2	2	1	1	1
cap92	1.08	1.08	1.08	1.07	1.07	1.08	10	10	10	9	9	9
cap93	1.42	1.42	1.42	1.59	1.59	1.59	2	2	2	5	5	5
cap94	4.04	4.10	3.78	3.68	3.69	3.68	7	7	7	1	1	1
cap101	0.04	0.04	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap102	0.04	0.03	0.04	0.06	0.06	0.06	0	0	0	0	0	0
cap103	0.04	0.05	0.04	0.05	0.05	0.05	0	0	0	0	0	0
cap104	0.03	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap121	4.83	4.83	4.85	5.27	5.28	5.28	2	2	2	2	2	2
cap122	2.49	2.49	2.49	2.64	2.65	2.65	7	7	7	3	3	3
cap123	3.06	3.05	3.07	3.32	3.32	3.32	15	15	15	1	1	1
cap124	8.11	8.06	8.07	8.56	8.55	8.56	25	25	25	1	1	1
cap131	0.07	0.07	0.07	0.09	0.09	0.09	0	0	0	0	0	0
cap132	0.09	0.09	0.10	0.10	0.10	0.10	0	0	0	0	0	0
cap133	0.11	0.11	0.11	0.11	0.11	0.11	0	0	0	0	0	0
cap134	0.11	0.11	0.10	0.10	0.10	0.10	0	0	0	0	0	0
Avg.	1.24	1.24	1.23	1.35	1.36	1.36						

Computational results for Beasley's medium problems. Option: k = 8, p = 5, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	950608.43	950608.43	950608.43	0.043	0.000	0.000	0.000
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950644.44	950644.44	950644.44	0.004	0.004	0.004	0.004
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.33	851495.33	851495.33	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.000	0.000	0.000

Computational results for Beasley's medium problems. Option: k = 8, p = 10, r = 30

Pr. No.	Opt. Sol.	Objective Value				% Deviation			
		<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>HP</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap62	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap63	1014099.61	1014099.61	1014099.61	1014099.61	1014099.61	0.000	0.000	0.000	0.000
cap64	1053197.44	1053197.44	1053197.44	1053197.44	1053197.44	0.000	0.000	0.000	0.000
cap71	932615.75	932615.75	932615.75	932615.75	932615.75	0.000	0.000	0.000	0.000
cap72	977799.40	977799.40	977799.40	977799.40	977799.40	0.000	0.000	0.000	0.000
cap73	1010641.45	1010641.45	1010641.45	1010641.45	1010641.45	0.000	0.000	0.000	0.000
cap74	1034976.97	1034976.98	1034976.97	1034976.97	1034976.97	0.000	0.000	0.000	0.000
cap91	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap92	858109.32	858109.33	858109.32	858109.32	858109.32	0.000	0.000	0.000	0.000
cap93	900760.11	900760.11	900760.11	900760.11	900760.11	0.000	0.000	0.000	0.000
cap94	950608.42	951015.19	951015.19	951015.19	951015.19	0.043	0.043	0.043	0.043
cap101	796648.44	796648.44	796648.44	796648.44	796648.44	0.000	0.000	0.000	0.000
cap102	854704.20	854704.20	854704.20	854704.20	854704.20	0.000	0.000	0.000	0.000
cap103	893782.11	893782.11	893782.11	893782.11	893782.11	0.000	0.000	0.000	0.000
cap104	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
cap121	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap122	854900.45	854900.45	854900.45	854900.45	854900.45	0.000	0.000	0.000	0.000
cap123	898266.08	898266.08	898266.08	898266.08	898266.08	0.000	0.000	0.000	0.000
cap124	950608.43	950644.44	950608.43	950608.43	950608.43	0.004	0.000	0.000	0.000
cap131	793439.56	793439.56	793439.56	793439.56	793439.56	0.000	0.000	0.000	0.000
cap132	851495.32	851495.32	851495.32	851495.32	851495.32	0.000	0.000	0.000	0.000
cap133	893076.71	893076.71	893076.71	893076.71	893076.71	0.000	0.000	0.000	0.000
cap134	928941.75	928941.75	928941.75	928941.75	928941.75	0.000	0.000	0.000	0.000
Avg.						0.002	0.002	0.002	0.002

Time (sec.)s and best restarts for Beasley's medium problems. k = 8, r = 30

Pr. No.	Time (sec.)						Best Restart					
	p=5			p=10			p=5			p=10		
	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>	<i>bfs</i>	<i>dfs</i>	<i>bs</i>
cap61	0.55	0.55	0.55	0.94	0.94	0.94	2	2	2	2	2	2
cap62	0.47	0.46	0.47	0.62	0.62	0.62	4	4	4	5	5	5
cap63	0.73	0.74	0.73	1.21	1.21	1.21	6	6	6	1	1	1
cap64	1.04	1.06	1.05	1.58	1.67	1.56	1	1	1	1	15	11
cap71	0.02	0.01	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap72	0.02	0.02	0.02	0.02	0.02	0.03	0	0	0	0	0	0
cap73	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap74	0.02	0.02	0.02	0.03	0.03	0.03	0	0	0	0	0	0
cap91	1.33	1.33	1.34	1.20	1.20	1.21	2	2	2	1	1	1
cap92	1.08	1.09	1.09	1.07	1.08	1.07	10	10	10	9	9	9
cap93	1.46	1.46	1.47	1.60	1.60	1.59	3	3	3	5	5	5
cap94	3.69	3.68	3.69	3.64	3.64	3.65	7	7	7	9	9	9
cap101	0.04	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap102	0.04	0.04	0.04	0.06	0.06	0.06	0	0	0	0	0	0
cap103	0.05	0.04	0.05	0.05	0.05	0.05	0	0	0	0	0	0
cap104	0.03	0.03	0.03	0.05	0.05	0.05	0	0	0	0	0	0
cap121	4.83	4.84	4.83	5.87	5.87	5.87	2	2	2	2	2	2
cap122	2.48	2.48	2.49	2.66	2.66	2.66	7	7	7	3	3	3
cap123	3.05	3.05	3.07	3.24	3.24	3.24	15	15	15	1	1	1
cap124	9.67	9.66	9.66	9.63	9.62	9.62	1	1	1	30	30	30
cap131	0.07	0.07	0.07	0.09	0.10	0.09	0	0	0	0	0	0
cap132	0.09	0.09	0.09	0.10	0.10	0.10	0	0	0	0	0	0
cap133	0.11	0.11	0.11	0.11	0.11	0.11	0	0	0	0	0	0
cap134	0.10	0.11	0.11	0.10	0.10	0.10	0	0	0	0	0	0
Avg.	1.29	1.29	1.29	1.42	1.42	1.42						