

The Linear Ordering Problem

Best Known solutions

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TS= Tabu Search method by Laguna, Martí and Campos (1999) with stopping parameter = 10000

VNS= Variable Neighborhood Search by García, Pérez-Brito, Campos and Martí (2004)
with stopping parameter = 20000

The experiments were run on a Pentium IV at 3Ghz. CPU times are in seconds.

In all the 49 LOLIB instances and the 25 Random instances of Type Ia and size 35,
both methods obtain the global optimum.

Stanford Graphbase Instances (size 75)

SGB75	TS value	TS CPU	VNS value	VNS CPU	BestKnown
1	6144679	5.22	6144679	4.84	6144679
2	6100491	5.19	6100491	4.72	6100491
3	6165775	4.03	6165775	4.63	6165775
4	6154958	6.23	6154958	4.89	6154958
5	6141070	4.11	6141070	4.24	6141070
6	6144055	5.61	6144055	4.20	6144055
7	6142899	4.05	6142899	4.31	6142899
8	6154094	7.02	6154094	5.63	6154094
9	6135459	3.84	6135459	4.38	6135459
10	6149271	4.13	6149271	4.92	6149271
11	6151750	4.23	6151750	4.53	6151750
12	6150469	4.56	6150469	5.08	6150469
13	6156935	7.64	6156935	4.80	6156935
14	6149693	5.69	6149693	4.86	6149693
15	6150331	7.34	6150331	6.45	6150331
16	6164959	4.48	6164959	4.89	6164959
17	6163483	5.95	6163483	5.77	6163483
18	6063548	4.20	6063548	5.00	6063548
19	6150967	4.41	6150967	4.67	6150967
20	6152224	4.14	6152224	4.53	6152224
21	6159081	4.16	6159081	4.34	6159081
22	6127019	4.25	6127019	4.78	6127019
23	6136362	3.81	6136362	4.66	6136362
24	6168513	5.31	6168513	4.59	6168513
25	6150026	3.80	6150026	4.33	6150026

Random Instances (Type I, size 100 and 150)

Random I	TS value	TS CPU	VNS value	VNS CPU	BestKnown
t1d100.1	271622	6.25	271549	5.56	271622
t1d100.2	271170	7.23	271106	5.83	271170
t1d100.3	273824	6.41	272794	6.38	273824
t1d100.4	271160	8.89	270978	5.56	271160
t1d100.5	272946	11.61	272459	7.53	272946
t1d100.6	270217	6.66	270326	5.52	270326
t1d100.7	273785	10.92	272892	5.67	273785
t1d100.8	273452	7.41	272637	7.41	273452
t1d100.9	273480	6.44	273326	8.17	273480
t1d100.10	273066	6.52	273066	5.91	273066
t1d100.11	270882	6.20	270671	5.72	270882
t1d100.12	270916	9.33	270698	11.25	270916
t1d100.13	271804	6.19	271695	5.70	271804
t1d100.14	269376	6.52	269048	9.19	269376
t1d100.15	274847	6.22	274403	5.67	274847
t1d100.16	273216	6.64	273207	6.92	273216
t1d100.17	273025	6.78	272735	6.06	273025
t1d100.18	270951	6.50	270892	5.92	270951
t1d100.19	270650	7.45	270648	5.81	270650
t1d100.20	274625	6.78	274111	11.24	274625
t1d100.21	274582	7.14	274197	9.25	274582
t1d100.22	272059	7.33	272026	5.78	272059
t1d100.23	271970	8.19	271881	7.19	271970
t1d100.24	271912	7.36	271809	6.19	271912
t1d100.25	270764	8.00	270477	6.55	270764
t1d150.1	603998	15.53	603406	11.77	603998
t1d150.2	605999	14.42	606406	11.78	606406
t1d150.3	605225	19.91	604773	23.20	605225
t1d150.4	603964	19.89	603436	12.44	603964
t1d150.5	603634	15.36	602399	14.08	603634
t1d150.6	602881	23.11	602138	11.84	602881
t1d150.7	606175	16.36	605758	12.80	606175
t1d150.8	612316	18.17	611411	33.58	612316
t1d150.9	607992	24.02	607846	12.97	607992
t1d150.10	608651	17.91	607272	18.03	608651
t1d150.11	602967	17.19	601710	12.53	602967
t1d150.12	605220	19.69	603997	13.91	605220
t1d150.13	605124	16.89	604009	18.52	605124
t1d150.14	605464	21.63	603980	12.06	605464
t1d150.15	608996	20.22	607691	12.78	608996
t1d150.16	606339	18.30	605393	15.03	606339
t1d150.17	605411	24.61	604338	11.66	605411
t1d150.18	603312	26.52	602122	12.06	603312
t1d150.19	602956	16.58	601845	12.11	602956
t1d150.20	605873	18.38	605116	11.69	605873
t1d150.21	606705	22.84	606649	35.36	606705
t1d150.22	604914	18.84	604541	16.95	604914
t1d150.23	605898	17.45	605432	12.16	605898
t1d150.24	606704	22.13	605205	11.25	606704
t1d150.25	605900	16.52	605737	11.72	605900

Random Instances (Type I, size 200)

Random I	TS value	TS CPU	VNS value	VNS CPU	BestKnown
t1d200.1	1066545	34.84	1065079	20.66	1066545
t1d200.2	1067416	37.14	1068188	59.63	1068188
t1d200.3	1066618	61.27	1065538	21.09	1066618
t1d200.4	1068817	26.91	1067354	19.64	1068817
t1d200.5	1067804	33.25	1066589	21.52	1067804
t1d200.6	1066104	30.61	1063958	54.75	1066104
t1d200.7	1068049	47.42	1066199	34.91	1068049
t1d200.8	1070932	36.41	1069708	26.67	1070932
t1d200.9	1068787	29.91	1067518	25.77	1068787
t1d200.10	1070623	30.28	1068891	25.81	1070623
t1d200.11	1066238	44.67	1063600	24.53	1066238
t1d200.12	1069983	43.64	1067668	20.59	1069983
t1d200.13	1064734	32.25	1063454	22.83	1064734
t1d200.14	1068576	32.67	1066317	44.80	1068576
t1d200.15	1071280	28.72	1069335	22.36	1071280
t1d200.16	1069493	35.09	1067831	37.02	1069493
t1d200.17	1069387	58.95	1065097	23.06	1069387
t1d200.18	1068233	37.34	1065858	57.52	1068233
t1d200.19	1065566	30.83	1065582	26.11	1065582
t1d200.20	1068789	48.53	1068946	56.81	1068946
t1d200.21	1073835	31.52	1074094	25.44	1074094
t1d200.22	1064220	47.42	1062753	38.88	1064220
t1d200.23	1067725	40.19	1067148	38.30	1067725
t1d200.24	1069591	35.33	1068543	24.63	1069591
t1d200.25	1067428	29.25	1067090	26.13	1067428

Random Instances (Type II, size 100 and 150)

	TS value	TS CPU	VNS value	VNS CPU	BestKnown
t2d100.1	135648	4.70	135648	5.33	135648
t2d100.2	137192	4.89	137192	5.47	137192
t2d100.3	135865	4.75	135865	5.39	135865
t2d100.4	135962	4.86	135962	5.50	135962
t2d100.5	135384	4.73	135384	5.42	135384
t2d100.6	135505	5.08	135505	7.91	135505
t2d100.7	136468	4.75	136468	5.42	136468
t2d100.8	134686	5.56	134686	5.50	134686
t2d100.9	136759	5.50	136751	5.44	136759
t2d100.10	136225	4.86	136225	6.03	136225
t2d100.11	135296	4.80	135296	5.69	135296
t2d100.12	136262	4.80	136262	5.36	136262
t2d100.13	136840	4.84	136840	5.44	136840
t2d100.14	135722	5.00	135722	5.27	135722
t2d100.15	134902	4.70	134898	5.95	134902
t2d100.16	137001	5.22	137001	13.08	137001
t2d100.17	136284	4.92	136284	5.83	136284
t2d100.18	136386	4.89	136386	7.66	136386
t2d100.19	137389	5.06	137389	6.81	137389
t2d100.20	135435	5.14	135433	6.64	135435
t2d100.21	135024	5.52	135016	5.47	135024
t2d100.22	136592	4.84	136592	5.91	136592
t2d100.23	135632	4.84	135632	5.70	135632
t2d100.24	135195	4.95	135195	5.58	135195
t2d100.25	134612	4.88	134612	5.41	134612
t2d150.1	454420	13.02	454420	14.83	454420
t2d150.2	453199	13.19	453194	13.27	453199
t2d150.3	451061	12.41	451062	14.75	451062
t2d150.4	453473	13.30	453472	16.98	453473
t2d150.5	456476	11.81	456476	24.45	456476
t2d150.6	454210	11.91	454204	16.97	454210
t2d150.7	453249	13.50	453248	13.20	453249
t2d150.8	449718	12.47	449717	13.48	449718
t2d150.9	451618	12.58	451618	17.03	451618
t2d150.10	450615	12.80	450617	17.06	450617
t2d150.11	452677	12.28	452672	15.34	452677
t2d150.12	452277	14.31	452271	14.47	452277
t2d150.13	453659	12.45	453655	16.13	453659
t2d150.14	450212	12.47	450212	14.94	450212
t2d150.15	454950	12.67	454941	20.50	454950
t2d150.16	452369	12.83	452369	13.31	452369
t2d150.17	451149	13.02	451149	19.77	451149
t2d150.18	452872	12.78	452872	16.58	452872
t2d150.19	454457	13.28	454448	12.08	454457
t2d150.20	449790	15.73	449786	13.74	449790
t2d150.21	451283	15.11	451285	13.23	451285
t2d150.22	450816	12.11	450816	11.77	450816
t2d150.23	453797	13.17	453795	12.06	453797
t2d150.24	451160	13.58	451160	12.73	451160
t2d150.25	453286	15.02	453281	12.25	453286

Random Instances (Type II, size 200)

	TS value	TS CPU	VNS value	VNS CPU	BestKnown
t2d200.1	1063170	21.36	1063154	25.22	1063170
t2d200.2	1061259	21.08	1061259	38.59	1061259
t2d200.3	1059687	21.92	1059657	20.97	1059687
t2d200.4	1064725	23.78	1064711	30.64	1064725
t2d200.5	1064500	24.23	1064482	20.74	1064500
t2d200.6	1059401	27.81	1059383	35.86	1059401
t2d200.7	1064243	23.81	1064271	28.14	1064271
t2d200.8	1064468	23.17	1064484	23.61	1064484
t2d200.9	1059821	22.59	1059819	20.30	1059821
t2d200.10	1064348	20.19	1064356	24.63	1064356
t2d200.11	1063003	21.52	1063003	20.53	1063003
t2d200.12	1065731	27.13	1065733	25.84	1065733
t2d200.13	1057456	26.94	1057470	19.55	1057470
t2d200.14	1061322	21.53	1061300	25.16	1061322
t2d200.15	1059016	23.56	1059010	45.08	1059016
t2d200.16	1062815	21.28	1062795	25.09	1062815
t2d200.17	1054501	21.66	1054495	34.38	1054501
t2d200.18	1065141	25.64	1065131	39.25	1065141
t2d200.19	1057399	28.39	1057347	20.61	1057399
t2d200.20	1062760	22.19	1062758	20.59	1062760
t2d200.21	1060805	26.69	1060765	20.17	1060805
t2d200.22	1062479	36.50	1062487	37.16	1062487
t2d200.23	1061401	23.61	1061421	34.16	1061421
t2d200.24	1065109	21.41	1065093	20.44	1065109
t2d200.25	1063929	21.27	1063929	24.63	1063929