



UNIVERSITÀ
DI SIENA
1240

FAMILY OF LOCAL SEARCH FOR TSP RESULTS

Network Optimization

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Assignment

The project focus on implement and test a family of local search algorithms for TSP. Computational tests can be carried out on instances from the TSPLIB.

Contents of this paper

In this paper we show and discuss the results we have achieved through the application of Local Search algorithms to some instances of TSP.

We tested our project on six TSPLIB datasets:

1. xfq131
2. qa194
3. xqg237
4. pma343
5. pbn423
6. uy734

Here we show the results we achieved.

Test 1 NAME : xqf131

COMMENT : Bonn VLSI data set with 131 points

COMMENT : Uni Bonn, Research Institute for Discrete Math

COMMENT : Contributed by Andre Rohe

TYPE : TSP

DIMENSION : 131

EDGE_WEIGHT_TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	611.46	0.375
Rep. NN + 2-opt	588.99	0.249
NN + 2-opt + DLB	617.12	0.036
Rep. NN + 2-opt + DLB	588.00	0.025
NN + 3-opt	596.09	54.22
Rep. NN + 3-opt	582.67	31.25
NN + 3-opt + DLB	592.81	16.91
Rep. NN + 3-opt + DLB	583.95	12.51

Test 2 NAME : qa194

COMMENT : 194 locations in Qatar

COMMENT : Derived from National Imagery and Mapping Agency data

TYPE : TSP

DIMENSION : 194

EDGE_WEIGHT_TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	9918.47	4.549
Rep. NN + 2-opt	10025.7	4.575
NN + 2-opt + DLB	10206.3	0.108
Rep. NN + 2-opt + DLB	10303.1	0.088
NN + 3-opt	9671.97	477.280
Rep. NN + 3-opt	9855.99	341.904
NN + 3-opt + DLB	9615.97	440.434
Rep. NN + 3-opt + DLB	9974.63	102.517

Test 3 NAME : xqg237

COMMENT : Bonn VLSI data set with 237 points

COMMENT : Uni Bonn, Research Institute for Discrete Math

COMMENT : Contributed by Andre Rohe

TYPE : TSP

DIMENSION : 237

EDGE_WEIGHT_TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	1103.40	5.114
Rep. NN + 2-opt	1142.00	4.700
NN + 2-opt + DLB	1172.35	0.149
Rep. NN + 2-opt + DLB	1144.62	0.144
NN + 3-opt	-	-
Rep. NN + 3-opt	-	-
NN + 3-opt + DLB	1088.81	163.33
Rep. NN + 3-opt + DLB	1089.25	165.61

Test 4 NAME : pma343

COMMENT : Bonn VLSI data set with 343 points

COMMENT : Uni Bonn, Research Institute for Discrete Math

COMMENT : Contributed by Andre Rohe

TYPE : TSP

DIMENSION : 343

EDGE_WEIGHT_TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	1469.10	10.138
Rep. NN + 2-opt	1457.86	10.637
NN + 2-opt + DLB	1532.80	0.188
Rep. NN + 2-opt + DLB	1475.25	0.217
NN + 3-opt	-	-
Rep. NN + 3-opt	-	-
NN + 3-opt + DLB	1452.61	443.413
Rep. NN + 3-opt + DLB	1418.22	358.572

Test 5 NAME : pbn423

COMMENT : Bonn VLSI data set with 423 points

COMMENT : Uni Bonn, Research Institute for Discrete Math

COMMENT : Contributed by Andre Rohe

TYPE : TSP

DIMENSION : 423

EDGE_WEIGHT_TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	1486.18	23.194
Rep. NN + 2-opt	1521.41	21.788
NN + 2-opt + DLB	1534.23	0.458
Rep. NN + 2-opt + DLB	1524.99	0.474
NN + 3-opt	-	-
Rep. NN + 3-opt	-	-
NN + 3-opt + DLB	1461.77	1415.42
Rep. NN + 3-opt + DLB	1485.84	1060.92

Test 6 NAME : uy734

COMMENT : 734 locations in Uruguay

COMMENT : Derived from National Imagery and Mapping Agency data

TYPE : TSP

DIMENSION : 734

EDGE.WEIGHT.TYPE : EUC_2D

Method	Cost	Time
NN + 2-opt	85606.9	156.928
Rep. NN + 2-opt	83917.7	185.198
NN + 2-opt + DLB	87225.8	1.344
Rep. NN + 2-opt + DLB	86622.6	1.055
NN + 3-opt	-	-
Rep. NN + 3-opt	-	-
NN + 3-opt + DLB	83635.0	4969.66
Rep. NN + 3-opt + DLB	82986.5	4035.90