Resultados dos Problemas NETLIB - Solver HiGHS

Análise Computacional

17 de setembro de 2025

1 Informações dos Problemas

Esta tabela apresenta informações básicas sobre cada problema da coleção NETLIB, incluindo métricas de viabilidade.

Tabela 1: Informações dos problemas NETLIB

Problema	Nº de Variáveis	Nº de Restrições	Inviab. Primal	Inviab. Dual
25fv47	1572	821	0.000e+00	0.000e+00
80bau3b	9799	2262	0.000e+00	1.377e-14
Adlittle	97	56	0.000e+00	4.547e-13
Afiro	32	27	0.000e+00	0.000e+00
Agg	163	488	0.000e+00	0.000e+00
Agg2	302	516	0.000e+00	2.132e-14
Agg3	302	516	0.000e+00	2.132e-14
BNL2	3489	2324	0.000e+00	1.116e-14
BRANDY	249	220	0.000e+00	0.000e+00
Bandm1	472	305	0.000e+00	0.000e+00
Beaconfd	262	173	0.000e+00	0.000e+00
Blend	83	74	0.000e+00	4.025e-15
Boeig2	143	166	0.000e+00	6.939e-18
Boeing1	384	351	0.000e+00	2.776e-17
Bore3d	315	233	0.000e+00	0.000e+00
CAPRI	353	271	0.000e+00	0.000e+00
CYCLE	2857	1903	0.000e+00	6.990e-08
Czprob	3523	929	0.000e+00	2.842e-14
D2Q06C	5167	2171	4.349e-13	5.335e-13
D6CUBE	6184	415	2.703e-13	1.288e-14
DEGEN2	534	444	2.220e-16	0.000e+00
DEGEN3	1818	1503	1.776e-15	4.441e-16
DFL001	12230	6071	N/A	N/A
E226	282	223	0.000e+00	0.000e+00
ETAMACRO	688	400	0.000e+00	0.000e+00
FFFFF800	854	524	0.000e+00	2.132e-14
FINNIS	614	497	0.000e+00	0.000e+00
FIT1D	1026	24	0.000e+00	0.000e+00
PILOT	3652	1441	3.227e-08	0.000e+00
PILOTWE	2789	722	0.000e+00	0.000e+00
RECIPE	180	91	0.000e+00	0.000e+00
SC105	103	105	0.000e+00	0.000e+00
SHIP04S	1458	402	0.000e+00	0.000e+00
Sc205	203	205	0.000e+00	0.000e+00
Sc50a	48	50	0.000e+00	0.000e+00
Sc50b	48	50	0.000e+00	0.000e+00
Sc50teste	48	50	0.000e+00	0.000e+00
TAHA13MPS	2	4	0.000e+00	0.000e+00
bnl1	1175	643	0.000e+00	1.052e-12
forplan	421	161	0.000e+00	0.000e+00
ganges	1681	1309	3.638e-12	4.263e-13
gfrd-pnc	1092	616	0.000e+00	0.000e+00
greenbea	5405	2392	5.022e-14	1.819e-12
greenbeb	5405	2392	0.000e+00	8.743e-14
grow22	645	300	0.000e+00	5.995e-12
grow7	301	140	0.000e+00	3.999e-13
israel	142	174	0.000e+00	0.000e+00
kb2	41	43	0.000e+00	0.000e+00
lotfi	308	153	1.819e-12	0.000e+00

Problema	Nº de Variáveis	Nº de Restrições	Inviab. Primal	Inviab. Dual
maros	1443	846	8.882e-14	1.271e-15
modszk1	1620	687	1.819e-12	0.000e+00
nesm	2923	662	1.000e-08	1.819e-12
perold	1376	625	0.000e+00	6.106e-15
pilotnov	2172	975	1.634e-13	0.000e+00
scagr25	500	471	0.000e+00	0.000e+00
scagr7	140	129	0.000e+00	0.000e+00
scfxm1	457	330	5.500e-15	0.000e+00
scfxm2	914	660	5.500e-15	0.000e+00
scfxm3	1371	990	5.500e-15	0.000e+00
scorpion	358	388	0.000e+00	0.000e+00
scrs8	1169	490	0.000e+00	0.000e+00
scsd1	760	77	2.483e-17	2.854e-08
scsd6	1350	147	8.327e-17	7.603e-08
scsd8	2750	397	2.120e-15	1.599e-13
sctap2-1	1880	1090	0.000e+00	0.000e+00
sctap2	1880	1090	0.000e+00	0.000e+00
sctap3	2480	1480	0.000e+00	3.553e-15
seba	1028	515	0.000e+00	0.000e+00
share2b	79	96	0.000e+00	0.000e+00
shell	1775	536	0.000e+00	0.000e+00
ship04	2118	402	0.000e+00	0.000e+00
ship04l	2118	402	0.000e+00	0.000e+00
ship08l	4283	778	0.000e+00	0.000e+00
ship08s	2387	778	0.000e+00	0.000e+00
ship12l	5427	1151	0.000e+00	3.695e-13
ship12s	2763	1151	0.000e+00	0.000e+00
sierra	2036	1227	4.547e-13	6.821e-13
stair	467	356	0.000e+00	0.000e+00
standata	1075	359	0.000e+00	0.000e+00
tuff	587	333	0.000e+00	0.000e+00
vtp	203	198	0.000e+00	0.000e+00
wood1p	2594	244	0.000e+00	1.332e-15

2 Resultados de Convergência

Esta tabela apresenta os resultados de convergência para cada problema, incluindo o número de iterações, valor da função objetivo e o gap relativo.

Tabela 2: Resultados de convergência dos problemas NETLIB

Problema	Iterações	Primal	Dual	Gap Absoluto	Gap Relativo
25fv47	27	5.191e+03	5.191e+03	3.329e-15	6.412e-19
80bau3b	43	9.872e+05	1.130e+06	2.948e-16	2.986e-22
Adlittle	13	2.255e+05	2.255e+05	6.453e-17	2.862e-22
Afiro	7	-4.648e+02	-4.648e+02	6.109e-17	-1.314e-19
Agg	18	-3.599e+07	-3.599e+07	2.070e-16	-5.752e-24
Agg2	19	-2.024e+07	-2.024e+07	1.288e-15	-6.366e-23
Agg3	19	1.031e+07	1.031e+07	1.806e-16	1.752e-23
BNL2	32	1.811e+03	1.811e+03	5.648e-16	3.118e-19
BRANDY	17	1.519e+03	1.519e+03	7.484e-17	4.929e-20
Bandm1	17	-1.586e+02	-1.586e+02	9.823e-16	-6.193e-18
Beaconfd	11	3.359e+04	3.359e+04	1.083e-16	3.224e-21
Blend	10	-3.081e+01	-3.081e+01	1.135e-16	-3.682e-18
Boeig2	20	-3.150e+02	-2.823e+02	9.008e-17	-2.859e-19
Boeing1	24	-3.352e+02	-3.268e+02	8.466e-17	-2.526e-19
Bore3d	13	1.373e+03	0.000e+00	0.000e+00	0.000e+00
CAPRI	21	2.690e+03	-2.486e+03	0.000e+00	0.000e+00
CYCLE	33	-5.226e+00	0.000e+00	6.204e-16	-1.187e-16
Czprob	34	2.185e+06	2.185e+06	3.196e-16	1.463e-22
D2Q06C	34	1.228e+05	1.228e+05	0.000e+00	0.000e+00
D6CUBE	30	3.155e+02	3.103e+02	2.698e-16	8.553e-19
DEGEN2	15	-1.435e+03	-1.435e+03	4.751e-16	-3.311e-19
DEGEN3	21	-9.873e+02	-9.873e+02	1.151e-15	-1.166e-18
DFL001	0	N/A	N/A	N/A	N/A
E226	22	-1.164e+01	-1.875e+01	8.780e-16	-7.544e-17
ETAMACRO	30	-7.557e+02	-5.108e+01	1.503e-16	-1.989e-19
FFFFF800	28	5.557e+05	5.557e+05	3.143e-16	5.655e-22
FINNIS	26	1.728e+05	4.330e+05	1.684e-16	9.748e-22
FIT1D	19	-9.146e+03	0.000e+00	3.977e-16	-4.348e-20
PILOT	40	-5.575e+02	6.741e+01	2.863e-14	-5.135e-17
PILOTWE	39	-2.720e+06	-2.703e+06	0.000e+00	-0.000e+00

Tabela 2 – continuação da página anterior

Problema	Iterações Primal	Dual	Gap Absoluto	Gap Relativo
RECIPE	13	-2.666e+02	0.000e+00	6.384e-16	-2.395e-18
SC105	12	-5.220e+01	-5.220e+01	0.000e+00	-0.000e+00
SHIP04S	18	1.799e+06	1.799e+06	1.294e-16	7.196e-23
Sc205	12	-5.220e+01	-5.220e+01	5.393e-16	-1.033e-17
Sc50a	8	-6.458e+01	-6.458e+01	0.000e+00	-0.000e+00
Sc50b	8	-7.000e+01	-7.000e+01	1.008e-16	-1.440e-18
Sc50teste	8	-6.458e+01	-6.458e+01	0.000e+00	-0.000e+00
TAHA13MPS	4	-2.100e+01	-2.100e+01	0.000e+00	-0.000e+00
bnl1	33	1.978e+03	1.978e+03	4.598e-16	2.325e-19
forplan	23	-6.642e+02	-1.035e+03	3.421e-16	-5.150e-19
ganges	21	-1.096e+05	-5.851e+04	9.295e-16	-8.482e-21
gfrd-pnc	16	6.902e+06	-2.983e+05	4.048e-16	5.865e-23
greenbea	47	-7.256e+07	0.000e+00	5.134e-16	-7.077e-24
greenbeb	36	-4.302e+06	0.000e+00	0.000e+00	-0.000e+00
grow22	20	-1.069e+08	0.000e+00	6.274e-16	-5.871e-24
grow7	19	-4.779e+07	0.000e+00	7.795e-17	-1.631e-24
israel	24	-8.966e+05	-8.966e+05	6.492e-17	-7.240e-23
kb2	18	-1.750e+03	0.000e+00	1.299e-16	-7.423e-20
lotfi	19	-2.526e+01	-2.526e+01	1.379e-16	-5.458e-18
maros	24	-5.806e+04	-2.307e+04	1.880e-16	-3.237e-21
modszk1	20	3.206e+02	3.206e+02	1.177e-13	3.672e-16
nesm	38	1.408e+07	1.113e+08	3.441e-15	2.444e-22
perold	30	-9.381e+03	-1.124e+04	4.169e-15	-4.444e-19
pilotnov	27	-4.497e+03	4.962e+01	1.011e-16	-2.248e-20
scagr25	17	-1.475e+07	-1.475e+07	1.263e-16	-8.557e-24
scagr7	15	-2.331e+06	-2.331e+06	9.987e-17	-4.284e-23
scfxm1	22	1.842e+04	1.842e+04	9.877e-17	5.363e-21
scfxm2	22	3.666e+04	3.666e+04	0.000e+00	0.000e+00
scfxm3	22	5.490e+04	5.490e+04	5.301e-16	9.656e-21
scorpion	11	1.878e+03	1.878e+03	1.815e-16	9.666e-20
scrs8	21	9.043e+02	9.043e+02	3.141e-16	3.474e-19
scsd1	14	8.667e+00	8.667e+00	1.938e-16	2.236e-17
scsd6	22	5.050e+01	5.050e+01	1.393e-16	2.759e-18
scsd8	18	9.050e+02	9.050e+02	5.650e-16	6.243e-19
sctap2-1	20	1.725e+03	1.725e+03	6.589e-17	3.820e-20
sctap2	20	1.725e+03	1.725e+03	6.589e-17	3.820e-20
sctap3	21	1.424e+03	1.424e+03	0.000e+00	0.000e+00
seba	7	1.571e+04	1.938e+04	0.000e+00	0.000e+00
share2b	15	-4.157e+02	-4.157e+02	4.097e-15	-9.855e-18
shell	20	1.209e+09	0.000e+00	0.000e+00	0.000e+00
ship04	16	1.793e+06	1.793e+06	1.298e-16	7.240e-23
ship04l	16	1.793e+06	1.793e+06	1.298e-16	7.240e-23
ship08l	16	1.909e+06	1.909e+06	6.098e-17	3.194e-23
ship08s	14	1.920e+06	1.920e+06	4.850e-16	2.526e-22
ship12l	18	1.470e+06	1.470e+06	3.167e-16	2.154e-22
ship12s	16	1.489e+06	1.489e+06	1.485e-15	9.973e-22
sierra	22	1.539e+07	1.539e+07	4.235e-16	2.751e-23
stair	16	-2.513e+02	-9.077e+01	1.863e-15	-7.413e-18
standata	14	1.258e+03	0.000e+00	0.000e+00	0.000e+00
tuff	25	2.921e-01	0.000e+00	7.008e-17	2.399e-16
vtp	10	1.298e+05	-4.158e+05	3.362e-16	2.590e-21
wood1p	27	1.443e+00	1.443e+00	5.714e-17	3.960e-17

3   Observações

- O solver HiGHS foi configurado com o método IPM (Interior Point Method).

- Problemas com status "Optimal" convergiram com sucesso.

- A primeira tabela mostra informações básicas dos problemas e métricas de viabilidade.

- A segunda tabela apresenta métricas de convergência e qualidade da solução.

- As soluções detalhadas de cada problema (variáveis primais e duais) são salvas em arquivos individuais.

- As variáveis duais representam os multiplicadores de Lagrange das restrições.