

Solução do Problema bnl1 - Solver HiGHS

Análise Computacional

16 de setembro de 2025

1 Informações do Problema

Informações do Problema:

- Nome: bnl1
- Número de Variáveis: 1175
- Número de Restrições: 643
- Inviabilidade Primal: 0.000e+00
- Inviabilidade Dual: 1.052e-12
- Valor Primal: 1.978e+03
- Valor Dual: 1.978e+03
- Gap: 2.325e-19
- Número de Iterações: 33

2 Variáveis Primais e Custos Reduzidos

Tabela 1: Variáveis primais e custos reduzidos do problema bnl1

Coordenada x	Valor x	Coordenada z	Valor z
1	82.417595	1	0.000000
2	82.417595	2	0.000000
3	23.355899	3	0.000000
4	23.355899	4	0.000000
5	142.000000	5	0.000000
6	142.000000	6	0.000000
7	59.000000	7	0.000000
8	59.000000	8	0.000000
9	179.184734	9	0.000000
10	179.184734	10	0.000000
11	1.066027	11	0.000000
12	1.066027	12	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
13	1214.274205	13	0.000000
14	10.592116	14	0.000000
15	332.505130	15	0.000000
16	324.413422	16	0.000000
17	8.091708	17	0.000000
18	0.000000	18	0.020886
19	1448.274205	19	0.000000
20	0.000000	20	-0.000000
21	31.242116	21	0.000000
22	10.942478	22	0.000000
23	0.000000	23	0.000000
24	0.247596	24	0.000000
25	0.941505	25	0.000000
26	0.000000	26	3.125643
27	0.023523	27	0.000000
28	0.000000	28	0.000000
29	0.018819	29	0.000000
30	0.000000	30	1.828065
31	1.593102	31	0.000000
32	0.000000	32	0.000000
33	0.791667	33	0.000000
34	0.000000	34	0.000000
35	0.000000	35	0.000000
36	-0.000000	36	0.000000
37	0.000000	37	0.000000
38	0.000000	38	3.125643
39	0.000000	39	0.000000
40	0.000000	40	0.000000
41	-0.000000	41	0.000000
42	0.000000	42	1.828065
43	0.000000	43	-0.000000
44	0.000000	44	0.000000
45	-0.000000	45	0.000000
46	6.372030	46	0.000000
47	0.000000	47	0.000000
48	0.171054	48	0.000000
49	0.000000	49	-0.000000
50	0.000000	50	3.125643
51	0.000000	51	-0.000000
52	0.000000	52	-0.000000
53	-0.000000	53	0.000000
54	0.000000	54	1.828065
55	0.000000	55	-0.000000
56	0.850000	56	0.000000
57	0.000000	57	-0.000000
58	0.000000	58	-0.000000
59	0.000000	59	-0.000000
60	0.062518	60	0.000000
61	0.000000	61	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
62	0.000000	62	3.125643
63	1.361739	63	0.000000
64	0.000000	64	-0.000000
65	1.089392	65	0.000000
66	0.000000	66	1.828065
67	0.000000	67	-0.000000
68	0.000000	68	-0.000000
69	0.000000	69	-0.000000
70	0.773501	70	0.000000
71	5.167566	71	0.000000
72	0.000000	72	0.000000
73	0.178564	73	0.000000
74	0.000000	74	-0.000000
75	0.000000	75	3.125643
76	0.000000	76	-0.000000
77	0.065608	77	0.000000
78	-0.000000	78	0.000000
79	0.000000	79	1.828065
80	0.000000	80	-0.000000
81	0.000000	81	-0.000000
82	0.000000	82	-0.000000
83	0.000000	83	0.687999
84	0.068244	84	0.000000
85	0.122839	85	0.000000
86	0.098271	86	0.000000
87	0.054595	87	0.000000
88	3.708177	88	0.000000
89	6.937927	89	0.000000
90	0.413479	90	0.000000
91	0.000000	91	-0.000000
92	0.000000	92	3.125643
93	1.954343	93	0.000000
94	0.000000	94	-0.000000
95	1.563474	95	0.000000
96	0.000000	96	1.828065
97	0.000000	97	-0.000000
98	0.000000	98	-0.000000
99	0.000000	99	-0.000000
100	0.000000	100	0.434936
101	0.000000	101	0.397642
102	0.136500	102	0.000000
103	0.000000	103	0.497063
104	0.000000	104	3.556440
105	-0.000000	105	0.000000
106	0.000000	106	0.434936
107	0.000000	107	0.970453
108	0.000000	108	2.325129
109	0.000000	109	0.434936
110	0.000000	110	0.397642

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Coordenada x	Valor x	Coordenada z	Valor z
111	0.000000	111	0.497063
112	6.530966	112	0.000000
113	0.000000	113	-0.000000
114	0.000000	114	-0.000000
115	-0.000000	115	0.000000
116	0.000000	116	3.125643
117	0.011358	117	0.000000
118	0.000000	118	-0.000000
119	0.009087	119	0.000000
120	0.000000	120	1.828065
121	0.000000	121	-0.000000
122	0.000000	122	-0.000000
123	0.000000	123	0.000000
124	0.362831	124	0.000000
125	0.000000	125	-0.000000
126	0.000000	126	-0.000000
127	-0.000000	127	0.000000
128	0.000000	128	3.125643
129	0.000631	129	0.000000
130	0.000000	130	-0.000000
131	0.000505	131	0.000000
132	0.000000	132	1.828065
133	0.000000	133	-0.000000
134	0.000000	134	-0.000000
135	0.000000	135	0.000000
136	0.109157	136	0.000000
137	0.000033	137	0.000000
138	1.700000	138	0.000000
139	0.640480	139	0.000000
140	0.000000	140	0.265621
141	0.000000	141	0.300948
142	0.000000	142	0.265621
143	0.000000	143	0.143750
144	0.000000	144	1.141239
145	0.000000	145	0.000000
146	0.000000	146	0.000000
147	0.000000	147	0.000000
148	21.109171	148	0.000000
149	0.000000	149	0.000000
150	0.000000	150	-0.000000
151	0.000000	151	0.265621
152	0.000000	152	0.300948
153	0.000000	153	0.265621
154	0.000000	154	0.143750
155	0.000000	155	1.141239
156	31.264938	156	0.000000
157	3.474147	157	0.000000
158	10.214286	158	0.000000
159	31.390829	159	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
160	38.250000	160	0.000000
161	48.301012	161	0.000000
162	0.276391	162	0.000000
163	0.000000	163	0.035327
164	0.092477	164	0.000000
165	0.000000	165	0.224373
166	0.000000	166	1.221862
167	0.000000	167	0.250623
168	0.000000	168	0.080623
169	0.000000	169	0.080623
170	0.000000	170	0.090623
171	0.000000	171	0.090623
172	0.000000	172	0.120623
173	0.000000	173	0.526999
174	0.000000	174	0.562326
175	0.000000	175	0.526999
176	57.871793	176	0.000000
177	0.000000	177	1.047434
178	6.095890	178	0.000000
179	49.478383	179	0.000000
180	0.000000	180	0.252390
181	0.000000	181	0.306195
182	0.000000	182	0.996195
183	0.000000	183	0.906756
184	0.000000	184	2.014176
185	0.000000	185	2.049504
186	0.000000	186	2.014176
187	0.000000	187	0.535385
188	0.000000	188	1.582820
189	0.000000	189	0.535385
190	0.000000	190	0.535385
191	0.000000	191	0.787775
192	0.000000	192	0.841580
193	0.000000	193	1.531580
194	0.000000	194	1.442141
195	0.000000	195	0.545292
196	0.000000	196	0.580620
197	0.000000	197	0.545292
198	7.065707	198	0.000000
199	0.000000	199	1.047434
200	0.000000	200	0.000000
201	0.000000	201	0.000000
202	0.000000	202	0.252390
203	0.000000	203	0.306195
204	0.000000	204	0.996195
205	0.000000	205	0.906756
206	0.000000	206	0.000000
207	14.096386	207	0.000000
208	4.137186	208	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
209	25.000000	209	0.000000
210	0.000000	210	0.080000
211	0.000000	211	5.764358
212	0.000000	212	5.799685
213	0.000000	213	5.764358
214	0.000000	214	3.830161
215	0.000000	215	4.404647
216	0.000000	216	3.890161
217	0.000000	217	4.142551
218	0.000000	218	5.336356
219	0.000000	219	3.473014
220	0.000000	220	3.361216
221	0.000000	221	1.935794
222	0.000000	222	1.769806
223	0.157505	223	0.000000
224	0.000000	224	5.043017
225	0.000000	225	2.304354
226	0.000000	226	5.302323
227	0.000000	227	3.283203
228	0.000000	228	4.040373
229	0.000000	229	5.302323
230	0.000000	230	2.216062
231	0.000000	231	2.126623
232	0.220744	232	0.000000
233	0.000000	233	0.035327
234	0.101038	234	0.000000
235	0.000000	235	0.959834
236	0.000000	236	1.534321
237	0.000000	237	1.019834
238	0.000000	238	1.272224
239	0.000000	239	2.466029
240	0.000000	240	0.302688
241	0.000000	241	0.190889
242	187.912116	242	0.000000
243	105.494521	243	0.000000
244	49.280946	244	0.000000
245	25.925048	245	0.000000
246	292.520000	246	0.000000
247	150.520000	247	0.000000
248	118.000000	248	0.000000
249	59.000000	249	0.000000
250	394.206415	250	0.000000
251	215.021681	251	0.000000
252	3.357986	252	0.000000
253	2.291959	253	0.000000
254	62.536908	254	0.000000
255	22.740880	255	0.000000
256	0.000000	256	0.000000
257	-0.000000	257	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
258	0.000000	258	0.058348
259	1185.693182	259	0.000000
260	696.776517	260	0.000000
261	6.842112	261	0.000000
262	6.842112	262	0.000000
263	506.267363	263	0.000000
264	173.762233	264	0.000000
265	-0.000000	265	0.000000
266	0.000000	266	0.056433
267	775.724255	267	0.000000
268	0.000000	268	0.000000
269	-0.000000	269	0.000000
270	1.282896	270	0.000000
271	11.327349	271	0.000000
272	0.933059	272	0.000000
273	0.505450	273	0.000000
274	4.097986	274	0.000000
275	0.000000	275	172.588714
276	0.024700	276	0.000000
277	0.000000	277	19.632643
278	0.019760	278	0.000000
279	0.000000	279	0.000000
280	0.853297	280	0.000000
281	0.000000	281	0.000000
282	0.000000	282	0.000000
283	0.000000	283	0.228963
284	0.000000	284	0.209330
285	0.136500	285	0.000000
286	0.000000	286	0.261668
287	0.000000	287	172.815498
288	-0.000000	288	0.000000
289	0.000000	289	19.861606
290	0.000000	290	0.510874
291	0.000000	291	0.261668
292	0.000000	292	0.228963
293	0.000000	293	0.209330
294	0.000000	294	0.261668
295	0.000000	295	0.000000
296	5.004550	296	0.000000
297	0.000000	297	0.000000
298	0.000000	298	-0.000000
299	0.000000	299	172.588714
300	0.000000	300	0.000000
301	0.000000	301	19.632643
302	-0.000000	302	0.000000
303	1.501365	303	0.000000
304	0.000000	304	0.000000
305	0.000000	305	0.000000
306	0.000000	306	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
307	0.000000	307	-0.000000
308	0.000000	308	-0.000000
309	0.078699	309	0.000000
310	0.000000	310	-0.000000
311	0.000000	311	172.588714
312	1.714190	312	0.000000
313	0.000000	313	19.632643
314	1.371352	314	0.000000
315	0.000000	315	-0.000000
316	0.000000	316	-0.000000
317	0.000000	317	-0.000000
318	0.000000	318	0.000000
319	0.891801	319	0.000000
320	5.776509	320	0.000000
321	0.000000	321	0.000000
322	0.197103	322	0.000000
323	0.000000	323	0.000000
324	0.000000	324	172.588714
325	0.000000	325	0.000000
326	0.000000	326	19.632643
327	-0.000000	327	0.000000
328	0.000000	328	0.000000
329	0.000000	329	0.000000
330	0.000000	330	0.000000
331	0.000000	331	0.000000
332	0.000000	332	24.222426
333	0.136488	333	0.000000
334	0.245678	334	0.000000
335	0.196542	335	0.000000
336	0.109190	336	0.000000
337	20.884957	337	0.000000
338	3.453450	338	0.000000
339	0.000000	339	-0.000000
340	0.000000	340	-0.000000
341	0.000000	341	172.588714
342	3.334160	342	0.000000
343	0.000000	343	19.632643
344	2.667328	344	0.000000
345	2.028269	345	0.000000
346	0.000000	346	-0.000000
347	0.000000	347	0.000000
348	0.000000	348	0.000000
349	0.000000	349	-0.000000
350	0.000000	350	-0.000000
351	0.059052	351	0.000000
352	0.000000	352	-0.000000
353	0.000000	353	172.588714
354	0.000411	354	0.000000
355	0.000000	355	19.632643

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Coordenada x	Valor x	Coordenada z	Valor z
356	0.000329	356	0.000000
357	0.413366	357	0.000000
358	0.000000	358	-0.000000
359	0.000000	359	0.000000
360	0.000000	360	0.000000
361	0.000000	361	0.816930
362	0.000000	362	0.746881
363	0.295750	363	0.000000
364	0.000000	364	0.933623
365	0.000000	365	173.397870
366	-0.000000	366	0.000000
367	0.000000	367	20.449573
368	0.000000	368	1.822779
369	0.000000	369	0.933623
370	0.000000	370	0.816930
371	0.000000	371	0.746881
372	0.000000	372	0.933623
373	4.730291	373	0.000000
374	0.000000	374	-0.000000
375	0.102071	375	0.000000
376	0.000000	376	-0.000000
377	0.000000	377	172.588714
378	0.008937	378	0.000000
379	0.000000	379	19.632643
380	0.007149	380	0.000000
381	0.000000	381	-0.000000
382	0.000000	382	-0.000000
383	1.050000	383	0.000000
384	1.344500	384	0.000000
385	0.000000	385	0.000000
386	0.000000	386	-0.000000
387	0.059052	387	0.000000
388	0.000000	388	-0.000000
389	0.000000	389	172.588714
390	0.000411	390	0.000000
391	0.000000	391	19.632643
392	0.000329	392	0.000000
393	0.413366	393	0.000000
394	0.000000	394	-0.000000
395	0.000000	395	0.000000
396	0.000000	396	0.000000
397	0.145543	397	0.000000
398	0.000044	398	0.000000
399	1.861700	399	0.000000
400	1.328601	400	0.000000
401	0.786344	401	0.000000
402	0.000000	402	24.632668
403	0.000000	403	65.822495
404	0.000000	404	0.054850

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Coordenada x	Valor x	Coordenada z	Valor z
405	0.000000	405	0.761514
406	0.000000	406	0.000000
407	0.000000	407	0.000000
408	0.000000	408	-0.000000
409	19.038044	409	0.000000
410	0.000000	410	0.000000
411	0.000000	411	-0.000000
412	0.000000	412	-0.000000
413	0.000000	413	24.632668
414	0.000000	414	65.822495
415	0.000000	415	0.054850
416	0.000000	416	0.761514
417	32.191667	417	0.000000
418	26.067248	418	0.000000
419	4.943192	419	0.000000
420	40.128456	420	0.000000
421	41.750000	421	0.000000
422	50.393691	422	0.000000
423	0.793065	423	0.000000
424	0.000000	424	24.632668
425	0.000000	425	65.822495
426	0.000000	426	0.165144
427	0.000000	427	0.871808
428	0.000000	428	0.148694
429	0.000000	429	0.077894
430	0.000000	430	0.077894
431	0.000000	431	0.116294
432	0.000000	432	0.114294
433	0.000000	433	0.136594
434	0.000000	434	0.636383
435	0.000000	435	25.269051
436	0.000000	436	66.458878
437	78.302706	437	0.000000
438	0.000000	438	0.920356
439	6.796043	439	0.000000
440	34.468445	440	0.000000
441	0.000000	441	0.519883
442	0.000000	442	0.393342
443	0.000000	443	0.886642
444	0.000000	444	0.949007
445	0.000000	445	1.550839
446	0.000000	446	26.183507
447	0.000000	447	67.373334
448	0.000000	448	0.325753
449	0.000000	449	1.246109
450	0.000000	450	0.325753
451	0.000000	451	0.325753
452	0.000000	452	0.845637
453	0.000000	453	0.719195

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Coordenada x	Valor x	Coordenada z	Valor z
454	0.000000	454	1.212495
455	0.000000	455	1.274860
456	0.000000	456	0.633150
457	0.000000	457	25.265818
458	0.000000	458	66.455645
459	10.441044	459	0.000000
460	0.000000	460	0.920356
461	0.000000	461	0.000000
462	0.000000	462	0.000000
463	0.000000	463	0.519883
464	0.000000	464	0.393342
465	0.000000	465	0.886642
466	0.000000	466	0.949007
467	0.000000	467	0.048500
468	15.301205	468	0.000000
469	6.749081	469	0.000000
470	26.650000	470	0.000000
471	1.962134	471	0.000000
472	0.886340	472	0.000000
473	0.000000	473	20.767301
474	0.000000	474	39.431613
475	0.000000	475	3.193420
476	0.000000	476	4.689875
477	0.000000	477	3.229820
478	0.000000	478	3.749703
479	0.000000	479	4.314561
480	0.000000	480	2.962989
481	0.000000	481	3.040945
482	0.000000	482	821.493335
483	0.000000	483	751.052770
484	0.346511	484	0.000000
485	0.000000	485	986.264812
486	0.000000	486	329.344512
487	0.000000	487	941.436736
488	0.000000	488	937.277671
489	0.000000	489	938.837321
490	0.000000	490	941.436736
491	0.000000	491	328.481999
492	0.000000	492	328.544364
493	0.693069	493	0.000000
494	0.000000	494	20.767301
495	0.000000	495	39.431613
496	0.000000	496	3.571513
497	0.000000	497	5.067968
498	0.000000	498	3.405713
499	0.000000	499	3.925597
500	0.000000	500	4.494555
501	0.000000	501	2.956982
502	0.000000	502	3.034939

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Coordenada x	Valor x	Coordenada z	Valor z
503	1.550000	503	0.000000
504	0.300000	504	0.000000
505	0.200000	505	0.000000
506	0.220000	506	0.000000
507	0.680000	507	0.000000
508	0.490000	508	0.000000
509	0.030000	509	0.000000
510	3.000000	510	0.000000
511	0.130000	511	0.000000
512	0.350000	512	0.000000
513	0.410000	513	0.000000
514	0.030000	514	0.000000
515	0.010000	515	0.000000
516	0.840000	516	0.000000
517	16.022383	517	0.000000
518	0.230000	518	0.000000
519	0.000000	519	1.383800
520	0.750000	520	0.000000
521	0.056486	521	0.000000
522	0.120000	522	0.000000
523	0.150000	523	0.000000
524	-0.000000	524	0.000000
525	0.240000	525	0.000000
526	0.240000	526	0.000000
527	322.945104	527	0.000000
528	135.032987	528	0.000000
529	78.057749	529	0.000000
530	28.776803	530	0.000000
531	452.071200	531	0.000000
532	159.551200	532	0.000000
533	177.000000	533	0.000000
534	59.000000	534	0.000000
535	652.232432	535	0.000000
536	258.026017	536	0.000000
537	6.450056	537	0.000000
538	3.092070	538	0.000000
539	68.776845	539	0.000000
540	137.468631	540	0.000000
541	0.000000	541	0.000000
542	0.000000	542	0.000000
543	0.000000	543	0.034327
544	0.000000	544	0.034327
545	1190.811103	545	0.000000
546	99.160285	546	0.000000
547	62.214542	547	0.000000
548	0.000000	548	0.054472
549	766.910713	549	0.000000
550	244.529783	550	0.000000
551	16.113567	551	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
552	0.000000	552	0.004844
553	1091.650818	553	0.000000
554	0.000000	554	0.000000
555	62.214542	555	0.000000
556	2.779608	556	0.000000
557	0.000000	557	0.054472
558	18.110282	558	0.000000
559	0.000000	559	-0.000000
560	0.037142	560	0.000000
561	0.000000	561	0.000000
562	0.000000	562	3.243979
563	0.033843	563	0.000000
564	0.000000	564	-0.000000
565	0.027074	565	0.000000
566	0.000000	566	0.933643
567	1.200816	567	0.000000
568	1.250000	568	0.000000
569	1.009997	569	0.000000
570	2.971589	570	0.000000
571	0.000000	571	-0.000000
572	0.000000	572	0.000000
573	-0.000000	573	0.000000
574	0.000000	574	3.243979
575	0.005168	575	0.000000
576	0.000000	576	-0.000000
577	0.004134	577	0.000000
578	0.000000	578	0.933643
579	0.000000	579	0.000000
580	0.000000	580	0.000000
581	0.000000	581	-0.000000
582	5.536298	582	0.000000
583	0.000000	583	-0.000000
584	0.188907	584	0.000000
585	0.000000	585	0.000000
586	0.000000	586	3.243979
587	0.000000	587	0.000000
588	0.000000	588	-0.000000
589	-0.000000	589	0.000000
590	0.000000	590	0.933643
591	0.000000	591	0.000000
592	0.000000	592	-0.000000
593	0.000000	593	-0.000000
594	0.000000	594	-0.000000
595	0.000000	595	-0.000000
596	0.092565	596	0.000000
597	0.000000	597	0.000000
598	0.000000	598	3.243979
599	2.016212	599	0.000000
600	0.000000	600	-0.000000

Continua na próxima página

Coordenada x	Valor x	Coordenada z	Valor z
601	1.612969	601	0.000000
602	0.000000	602	0.933643
603	0.000000	603	-0.000000
604	0.000000	604	-0.000000
605	0.000000	605	-0.000000
606	1.025571	606	0.000000
607	4.890015	607	0.000000
608	0.000000	608	-0.000000
609	0.166854	609	0.000000
610	0.000000	610	0.000000
611	0.000000	611	3.243979
612	0.000000	612	0.000000
613	0.000000	613	-0.000000
614	-0.000000	614	0.000000
615	0.000000	615	0.933643
616	0.000000	616	0.000000
617	0.000000	617	0.000000
618	0.000000	618	-0.000000
619	0.000000	619	0.762273
620	0.293449	620	0.000000
621	0.528207	621	0.000000
622	0.422566	622	0.000000
623	0.234759	623	0.000000
624	16.377136	624	0.000000
625	10.284825	625	0.000000
626	0.405342	626	0.000000
627	0.000000	627	0.000000
628	0.000000	628	3.243979
629	4.674471	629	0.000000
630	0.000000	630	-0.000000
631	3.739576	631	0.000000
632	0.000000	632	0.933643
633	0.000000	633	0.000000
634	0.000000	634	-0.000000
635	0.000000	635	-0.000000
636	3.018757	636	0.000000
637	0.000000	637	-0.000000
638	0.000000	638	-0.000000
639	-0.000000	639	0.000000
640	0.000000	640	3.243979
641	0.005250	641	0.000000
642	0.000000	642	-0.000000
643	0.004200	643	0.000000
644	0.000000	644	0.933643
645	0.000000	645	0.000000
646	0.000000	646	-0.000000
647	0.000000	647	0.000000
648	0.000000	648	0.000000
649	1.478617	649	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
650	0.000000	650	-0.000000
651	0.000000	651	0.000000
652	0.000000	652	3.243979
653	-0.000000	653	0.000000
654	0.000000	654	-0.000000
655	-0.000000	655	0.000000
656	0.000000	656	0.933643
657	0.000000	657	0.000000
658	0.000000	658	0.000000
659	0.887170	659	0.000000
660	5.204305	660	0.000000
661	0.000000	661	-0.000000
662	0.326437	662	0.000000
663	2.285061	663	0.000000
664	0.000000	664	3.243979
665	0.011549	665	0.000000
666	0.130651	666	0.000000
667	0.009239	667	0.000000
668	0.000000	668	0.933643
669	0.000000	669	-0.000000
670	0.000000	670	-0.000000
671	0.000000	671	-0.000000
672	0.589601	672	0.000000
673	0.000000	673	-0.000000
674	0.000000	674	-0.000000
675	-0.000000	675	0.000000
676	0.000000	676	3.243979
677	0.001025	677	0.000000
678	0.000000	678	-0.000000
679	0.000820	679	0.000000
680	0.000000	680	0.933643
681	0.000000	681	-0.000000
682	0.000000	682	-0.000000
683	0.000000	683	-0.000000
684	0.196483	684	0.000000
685	0.000060	685	0.000000
686	2.023300	686	0.000000
687	1.554464	687	0.000000
688	0.000000	688	0.177368
689	0.000000	689	0.329871
690	0.000000	690	0.047458
691	0.000000	691	0.013650
692	0.000000	692	0.562690
693	7.590926	693	0.000000
694	0.000000	694	0.000000
695	12.119143	695	0.000000
696	0.000000	696	-0.000000
697	0.000000	697	0.000000
698	0.000000	698	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
699	0.000000	699	0.177368
700	0.000000	700	0.329871
701	0.000000	701	0.047458
702	0.000000	702	0.013650
703	0.000000	703	0.562690
704	31.285019	704	0.000000
705	39.891651	705	0.000000
706	0.000000	706	0.000000
707	65.833500	707	0.000000
708	45.250000	708	0.000000
709	52.308936	709	0.000000
710	0.000000	710	0.129911
711	0.000000	711	0.282414
712	0.437404	712	0.000000
713	0.000000	713	0.052850
714	0.000000	714	0.601890
715	0.000000	715	0.003161
716	1.406132	716	0.000000
717	0.000000	717	0.000000
718	0.000000	718	0.043000
719	0.000000	719	0.040500
720	0.000000	720	0.056400
721	0.000000	721	0.601017
722	0.000000	722	0.753520
723	0.000000	723	0.471107
724	112.550000	724	0.000000
725	0.000000	725	0.676138
726	7.496195	726	0.000000
727	10.381400	727	0.000000
728	0.000000	728	0.310297
729	0.000000	729	0.250848
730	0.000000	730	0.595348
731	0.000000	731	0.571138
732	0.000000	732	0.873123
733	0.000000	733	1.025626
734	0.000000	734	0.743212
735	0.000000	735	0.069349
736	0.000000	736	0.745488
737	0.000000	737	0.069349
738	0.000000	738	0.069449
739	0.000000	739	0.379746
740	0.000000	740	0.320298
741	0.000000	741	0.664798
742	0.000000	742	0.640587
743	0.000000	743	0.603884
744	0.000000	744	0.756388
745	0.000000	745	0.473974
746	0.000000	746	0.000000
747	0.000000	747	0.676138

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Coordenada x	Valor x	Coordenada z	Valor z
748	0.000000	748	0.000000
749	15.452745	749	0.000000
750	0.000000	750	0.310297
751	0.000000	751	0.250848
752	0.000000	752	0.595448
753	0.000000	753	0.571238
754	0.000000	754	0.000000
755	16.506024	755	0.000000
756	4.427478	756	0.000000
757	28.300000	757	0.000000
758	0.000000	758	0.029400
759	0.000000	759	3.885093
760	0.000000	760	4.056624
761	0.000000	761	3.885093
762	0.000000	762	2.332532
763	0.000000	763	3.257343
764	0.000000	764	2.354632
765	0.000000	765	2.664928
766	0.000000	766	3.024880
767	0.000000	767	2.269870
768	0.000000	768	2.239608
769	0.000000	769	9.399168
770	0.000000	770	8.593218
771	0.744999	771	0.000000
772	0.000000	772	12.553705
773	0.000000	773	4.541552
774	0.000000	774	13.226893
775	0.000000	775	10.744520
776	0.000000	776	11.675410
777	0.000000	777	13.226893
778	0.000000	778	4.093189
779	0.000000	779	4.068979
780	1.244109	780	0.000000
781	0.000000	781	0.171531
782	0.245990	782	0.000000
783	0.000000	783	0.552966
784	0.000000	784	1.477778
785	0.000000	785	0.329766
786	0.000000	786	0.640063
787	0.000000	787	1.004915
788	0.000000	788	0.134705
789	0.000000	789	0.104442
790	1.733600	790	0.000000
791	0.519000	791	0.000000
792	0.236000	792	0.000000
793	0.188523	793	0.000000
794	0.724000	794	0.000000
795	-0.000000	795	0.000000
796	0.069000	796	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
797	3.677020	797	0.000000
798	0.702000	798	0.000000
799	0.000000	799	2.007461
800	0.429000	800	0.000000
801	0.032500	801	0.000000
802	0.014000	802	0.000000
803	0.906400	803	0.000000
804	19.602686	804	0.000000
805	0.150819	805	0.000000
806	0.000000	806	0.713000
807	1.113600	807	0.000000
808	-0.000000	808	0.000000
809	0.253000	809	0.000000
810	0.322000	810	0.000000
811	5.298133	811	0.000000
812	0.432000	812	0.000000
813	0.432000	813	0.000000
814	1.550000	814	0.000000
815	0.300000	815	0.000000
816	0.200000	816	0.000000
817	0.220000	817	0.000000
818	0.680000	818	0.000000
819	0.490000	819	0.000000
820	0.030000	820	0.000000
821	3.000000	821	0.000000
822	0.130000	822	0.000000
823	0.350000	823	0.000000
824	0.410000	824	0.000000
825	0.030000	825	0.000000
826	0.010000	826	0.000000
827	0.840000	827	0.000000
828	16.022383	828	0.000000
829	0.230000	829	0.000000
830	0.000000	830	0.000000
831	0.750000	831	0.000000
832	0.056486	832	0.000000
833	0.120000	833	0.000000
834	0.150000	834	0.000000
835	0.000000	835	0.050300
836	0.240000	836	0.000000
837	0.240000	837	0.000000
838	495.787328	838	0.000000
839	172.842224	839	0.000000
840	110.000000	840	0.000000
841	31.942251	841	0.000000
842	621.195472	842	0.000000
843	169.124272	843	0.000000
844	236.000000	844	0.000000
845	59.000000	845	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
846	942.334770	846	0.000000
847	290.102338	847	0.000000
848	9.539521	848	0.000000
849	3.089464	849	0.000000
850	-0.000000	850	0.000000
851	315.672908	851	0.000000
852	0.000000	852	0.000000
853	-0.000000	853	0.000000
854	0.000000	854	0.019260
855	0.000000	855	0.024021
856	1544.947129	856	0.000000
857	0.000000	857	0.053587
858	0.000000	858	0.004761
859	42.759310	859	0.000000
860	0.000000	860	0.063406
861	0.000000	861	0.008107
862	1124.053531	862	0.000000
863	346.068157	863	0.000000
864	11.074661	864	0.000000
865	0.000000	865	0.001435
866	1544.947129	866	0.000000
867	0.000000	867	0.000000
868	42.759310	868	0.000000
869	22.234841	869	0.000000
870	0.000000	870	0.063406
871	22.251872	871	0.000000
872	0.000000	872	-0.000000
873	0.000000	873	0.075934
874	0.870000	874	0.000000
875	0.000000	875	2.177334
876	0.041811	876	0.000000
877	0.089795	877	0.000000
878	0.033448	878	0.000000
879	0.000000	879	0.136128
880	1.699442	880	0.000000
881	1.450000	881	0.000000
882	0.000000	882	0.000000
883	0.000000	883	0.007149
884	2.704801	884	0.000000
885	0.206232	885	0.000000
886	0.000000	886	0.019006
887	0.000000	887	2.184068
888	1.134305	888	0.000000
889	0.000000	889	0.007149
890	0.907444	890	0.000000
891	0.000000	891	0.155134
892	0.000000	892	0.007149
893	0.000000	893	0.000000
894	0.000000	894	0.019006

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Coordenada x	Valor x	Coordenada z	Valor z
895	0.000000	895	0.007149
896	1.605136	896	0.000000
897	0.000000	897	-0.000000
898	0.000000	898	0.019006
899	0.000000	899	2.184068
900	1.907247	900	0.000000
901	0.000000	901	0.007149
902	1.525797	902	0.000000
903	0.000000	903	0.155134
904	0.000000	904	0.007149
905	0.000000	905	0.000000
906	0.000000	906	0.019006
907	0.000000	907	0.007149
908	1.249387	908	0.000000
909	0.000000	909	-0.000000
910	0.000000	910	0.019006
911	0.000000	911	2.184068
912	1.484541	912	0.000000
913	0.000000	913	0.007149
914	1.187633	914	0.000000
915	0.000000	915	0.155134
916	0.000000	916	0.007149
917	0.000000	917	-0.000000
918	0.000000	918	0.019006
919	1.179407	919	0.000000
920	0.000000	920	0.007149
921	1.323288	921	0.000000
922	0.000000	922	-0.000000
923	0.000000	923	0.019006
924	0.000000	924	2.184068
925	1.573252	925	0.000000
926	0.000000	926	0.007149
927	1.258601	927	0.000000
928	0.000000	928	0.155134
929	0.000000	929	0.007149
930	0.000000	930	-0.000000
931	0.000000	931	0.019006
932	0.000000	932	0.701162
933	0.630914	933	0.000000
934	1.135646	934	0.000000
935	0.908517	935	0.000000
936	0.504732	936	0.000000
937	32.813500	937	0.000000
938	6.627135	938	0.000000
939	0.000000	939	0.075934
940	1.526281	940	0.000000
941	0.000000	941	2.177334
942	0.057067	942	0.000000
943	0.000000	943	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
944	0.045654	944	0.000000
945	0.000000	945	0.136128
946	0.000000	946	-0.000000
947	0.000000	947	-0.000000
948	2.450000	948	0.000000
949	3.860068	949	0.000000
950	-0.000000	950	0.000000
951	0.000000	951	0.075934
952	0.000000	952	0.000000
953	0.000000	953	2.177334
954	2.059297	954	0.000000
955	0.000000	955	0.000000
956	1.647438	956	0.000000
957	0.000000	957	0.136128
958	0.000000	958	0.000000
959	0.000000	959	-0.000000
960	0.000000	960	0.000000
961	2.358404	961	0.000000
962	-0.000000	962	0.000000
963	0.000000	963	0.075934
964	0.000000	964	0.000000
965	0.000000	965	2.177334
966	0.004102	966	0.000000
967	0.000000	967	0.000000
968	0.003281	968	0.000000
969	0.000000	969	0.136128
970	0.000000	970	0.000000
971	0.000000	971	0.000000
972	0.000000	972	0.000000
973	8.736618	973	0.000000
974	-0.000000	974	0.000000
975	0.000000	975	0.075934
976	0.000000	976	0.000000
977	0.000000	977	2.177334
978	0.015194	978	0.000000
979	0.000000	979	0.000000
980	0.012155	980	0.000000
981	0.000000	981	0.136128
982	0.000000	982	0.000000
983	0.000000	983	-0.000000
984	0.000000	984	0.000000
985	0.000000	985	-0.000000
986	0.462068	986	0.000000
987	0.000000	987	0.075934
988	0.277241	988	0.000000
989	0.000000	989	2.177334
990	-0.000000	990	0.000000
991	0.000000	991	0.000000
992	-0.000000	992	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
993	0.000000	993	0.136128
994	0.000000	994	-0.000000
995	0.000000	995	-0.000000
996	0.000000	996	0.000000
997	0.265252	997	0.000000
998	0.000080	998	0.000000
999	2.185000	999	0.000000
1000	1.818722	1000	0.000000
1001	0.000000	1001	0.436254
1002	0.000000	1002	0.526565
1003	0.000000	1003	0.000000
1004	4.941887	1004	0.000000
1005	0.000000	1005	0.274658
1006	0.000000	1006	0.000000
1007	0.000000	1007	0.003712
1008	13.071429	1008	0.000000
1009	0.000000	1009	0.000000
1010	0.000000	1010	-0.000000
1011	0.000000	1011	0.000000
1012	0.000000	1012	0.436254
1013	0.000000	1013	0.526565
1014	0.787328	1014	0.000000
1015	48.169136	1015	0.000000
1016	0.000000	1016	0.274658
1017	43.277142	1017	0.000000
1018	0.000000	1018	0.003712
1019	0.000000	1019	0.000000
1020	72.500000	1020	0.000000
1021	48.750000	1021	0.000000
1022	49.286684	1022	0.000000
1023	0.000000	1023	0.449512
1024	0.000000	1024	0.539823
1025	0.000000	1025	0.013258
1026	0.000000	1026	0.039049
1027	0.000000	1027	0.313708
1028	2.376511	1028	0.000000
1029	0.000000	1029	0.006962
1030	0.000000	1030	0.003249
1031	0.000000	1031	0.041249
1032	0.000000	1032	0.038949
1033	0.000000	1033	0.050149
1034	0.000000	1034	0.731618
1035	0.000000	1035	0.821930
1036	0.000000	1036	0.295364
1037	67.014042	1037	0.000000
1038	0.000000	1038	0.360951
1039	8.196347	1039	0.000000
1040	66.526814	1040	0.000000
1041	0.000000	1041	0.203428

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Coordenada x	Valor x	Coordenada z	Valor z
1042	0.000000	1042	0.166492
1043	0.000000	1043	0.402992
1044	0.000000	1044	0.363850
1045	0.000000	1045	0.999614
1046	0.000000	1046	1.089925
1047	0.000000	1047	0.563360
1048	0.000000	1048	0.087563
1049	0.000000	1049	0.448514
1050	0.000000	1050	0.087563
1051	0.000000	1051	0.087563
1052	0.000000	1052	0.290991
1053	0.000000	1053	0.254155
1054	0.000000	1054	0.490655
1055	0.000000	1055	0.451513
1056	0.000000	1056	0.732617
1057	0.000000	1057	0.822928
1058	0.000000	1058	0.296363
1059	22.870063	1059	0.000000
1060	0.000000	1060	0.360951
1061	0.000000	1061	-0.000000
1062	0.000000	1062	-0.000000
1063	0.000000	1063	0.203428
1064	0.000000	1064	0.166592
1065	0.000000	1065	0.403092
1066	0.000000	1066	0.363950
1067	0.000000	1067	0.000000
1068	17.710843	1068	0.000000
1069	0.000000	1069	0.023778
1070	29.950000	1070	0.000000
1071	0.000000	1071	0.041678
1072	0.000000	1072	1.776588
1073	0.000000	1073	1.895971
1074	0.000000	1074	1.538821
1075	0.000000	1075	0.898520
1076	0.000000	1076	1.499924
1077	0.000000	1077	0.911920
1078	0.000000	1078	1.115348
1079	0.000000	1079	1.332812
1080	0.000000	1080	0.894526
1081	0.000000	1081	0.845598
1082	0.000000	1082	8.775526
1083	0.000000	1083	8.016515
1084	1.601748	1084	0.000000
1085	0.000000	1085	10.869005
1086	0.000000	1086	3.810101
1087	0.000000	1087	11.214358
1088	0.000000	1088	9.561479
1089	0.000000	1089	10.176005
1090	0.000000	1090	11.214358

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Coordenada x	Valor x	Coordenada z	Valor z
1091	0.000000	1091	3.560389
1092	0.000000	1092	3.521247
1093	0.000000	1093	0.237767
1094	0.000000	1094	0.357150
1095	0.787328	1095	0.000000
1096	0.000000	1096	0.343022
1097	0.000000	1097	0.944426
1098	0.000000	1098	0.133222
1099	0.000000	1099	0.336650
1100	0.000000	1100	0.558614
1101	0.000000	1101	0.048928
1102	4.393427	1102	0.000000
1103	1.979792	1103	0.000000
1104	1.416870	1104	0.000000
1105	0.267680	1105	0.000000
1106	0.067568	1106	0.000000
1107	0.763100	1107	0.000000
1108	0.000000	1108	0.194722
1109	0.148350	1109	0.000000
1110	0.000000	1110	0.862058
1111	1.305991	1111	0.000000
1112	0.000000	1112	0.410522
1113	0.438900	1113	0.000000
1114	0.040625	1114	0.000000
1115	0.018900	1115	0.000000
1116	1.000788	1116	0.000000
1117	18.364118	1117	0.000000
1118	0.000000	1118	0.131246
1119	0.000000	1119	0.283400
1120	2.198128	1120	0.000000
1121	0.000000	1121	1.265300
1122	0.543950	1122	0.000000
1123	0.692300	1123	0.000000
1124	7.281399	1124	0.000000
1125	0.777600	1125	0.000000
1126	0.777600	1126	0.000000
1127	1.733600	1127	0.000000
1128	0.519000	1128	0.000000
1129	0.236000	1129	0.000000
1130	0.188523	1130	0.000000
1131	0.724000	1131	0.000000
1132	0.000000	1132	0.269337
1133	0.069000	1133	0.000000
1134	3.677020	1134	0.000000
1135	0.702000	1135	0.000000
1136	-0.000000	1136	0.000000
1137	0.429000	1137	0.000000
1138	0.032500	1138	0.000000
1139	0.014000	1139	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
1140	0.906400	1140	0.000000
1141	19.602686	1141	0.000000
1142	0.150819	1142	0.000000
1143	0.000000	1143	0.000000
1144	1.113600	1144	0.000000
1145	0.000000	1145	3.183700
1146	0.253000	1146	0.000000
1147	0.322000	1147	0.000000
1148	5.298133	1148	0.000000
1149	0.432000	1149	0.000000
1150	0.432000	1150	0.000000
1151	1.550000	1151	0.000000
1152	0.300000	1152	0.000000
1153	0.200000	1153	0.000000
1154	0.220000	1154	0.000000
1155	0.680000	1155	0.000000
1156	0.490000	1156	0.000000
1157	0.030000	1157	0.000000
1158	3.000000	1158	0.000000
1159	0.130000	1159	0.000000
1160	0.350000	1160	0.000000
1161	0.410000	1161	0.000000
1162	0.030000	1162	0.000000
1163	0.010000	1163	0.000000
1164	0.840000	1164	0.000000
1165	16.022383	1165	0.000000
1166	0.230000	1166	0.000000
1167	0.000000	1167	0.000000
1168	0.750000	1168	0.000000
1169	0.056486	1169	0.000000
1170	0.120000	1170	0.000000
1171	0.150000	1171	0.000000
1172	-0.000000	1172	0.000000
1173	0.240000	1173	0.000000
1174	0.240000	1174	0.000000
1175	0.000000	1175	0.008107

3 Variáveis Duais (Multiplicadores de Lagrange)

Tabela 2: Variáveis duais do problema bn11

Coordenada y	Valor y
1	1.006601
2	1.006601
3	1.006601
4	1.006601
Continua na próxima página	

Coordenada y	Valor y
5	0.729532
6	1.006601
7	11.737820
8	1.006601
9	0.780437
10	1.006601
11	1.006601
12	1.006601
13	-0.000000
14	-0.000000
15	-0.000000
16	3.576617
17	-0.000000
18	10.529461
19	5.013344
20	16.259600
21	10.682302
22	9.445429
23	0.118769
24	-0.000000
25	6.378591
26	-0.000000
27	-0.000000
28	-0.000000
29	10.600618
30	8.962765
31	14.058307
32	-0.000000
33	-0.980489
34	-0.980489
35	-0.000000
36	-0.000000
37	-0.490109
38	-0.070451
39	-0.000000
40	-2.826813
41	-0.000000
42	0.172328
43	-0.032485
44	-0.000000
45	-0.000000
46	-0.000000
47	-0.000000
48	-0.000000
49	-0.227964
50	0.384878
51	1.261950
52	1.707651
53	3.693409

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Coordenada y	Valor y
54	3.458710
55	-1.363996
56	-0.000000
57	-0.644428
58	1.261950
59	0.499450
60	3.466826
61	6.066826
62	6.514022
63	-0.647874
64	0.419742
65	-1.597649
66	-1.597649
67	-1.597649
68	-1.597649
69	-0.000000
70	-0.000000
71	-0.000000
72	-0.000000
73	-0.000000
74	-0.000000
75	-0.000000
76	-0.000000
77	0.003623
78	-3.090016
79	-0.630975
80	-2.986083
81	-5.302323
82	-1.024590
83	4.062750
84	-0.000000
85	-1.261950
86	-1.597649
87	-0.000000
88	-1.597649
89	-0.000000
90	-0.000000
91	-0.000000
92	-1.597649
93	-0.000000
94	-1.597649
95	-0.000000
96	-1.976361
97	-0.000000
98	-0.000000
99	-0.000000
100	-3.366529
101	-3.366529
102	-0.016000
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Coordenada y	Valor y
103	-0.016000
104	-2.041150
105	427.171408
106	427.052349
107	427.171408
108	427.171408
109	424.951826
110	427.171408
111	1217.475945
112	427.171408
113	427.171408
114	426.746609
115	427.171408
116	427.171408
117	427.171408
118	426.405767
119	3.116135
120	-0.000000
121	3.676039
122	6.178800
123	1476.978551
124	16.999175
125	2.497045
126	-0.000000
127	-7.122434
128	-13.156101
129	-0.000000
130	-12.128234
131	-0.000000
132	-0.000000
133	9.385582
134	-0.000000
135	9.728916
136	8.735741
137	11.826278
138	-0.000000
139	-451.096686
140	-437.061223
141	-0.000000
142	-0.000000
143	-0.609460
144	0.446878
145	-0.070451
146	0.047087
147	-0.711404
148	-0.000000
149	0.125986
150	3.461160
151	-1.184081

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Coordenada y	Valor y
152	-0.000000
153	0.058348
154	0.058348
155	0.058348
156	-0.000000
157	-0.000000
158	-2.168701
159	1.438302
160	-0.032485
161	-0.000000
162	-0.682638
163	-0.000000
164	-0.000000
165	-0.000000
166	-0.595935
167	-0.000000
168	-0.905949
169	-0.140970
170	1.398719
171	-0.058348
172	2.599416
173	130.100194
174	258.661491
175	159.062132
176	-4.959270
177	-0.000000
178	-0.908157
179	2.599416
180	2.136916
181	8.400455
182	9.603455
183	9.291629
184	0.789177
185	1.564610
186	-221.979148
187	-221.979148
188	-221.979148
189	-221.979148
190	-221.979148
191	-0.000000
192	-0.000000
193	-0.000000
194	-0.000000
195	-0.000000
196	-0.000000
197	-0.000000
198	-0.026019
199	-2.599416
200	-1.299708

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Coordenada y	Valor y
201	-156.731062
202	-941.436736
203	-78.060116
204	284.527640
205	-0.000000
206	-2.599416
207	-221.979148
208	-0.000000
209	-221.979148
210	0.000000
211	-0.000000
212	-0.000000
213	-222.178513
214	-0.000000
215	-221.979148
216	-0.000000
217	-222.690474
218	-0.000000
219	-0.000000
220	-0.000000
221	-0.000000
222	-119.943402
223	-100.310759
224	0.330758
225	0.330758
226	-0.000000
227	-414.325518
228	-420.372108
229	-434.683250
230	-417.994948
231	-0.000000
232	-420.162951
233	-414.486842
234	-426.748173
235	-1308.980502
236	-449.279343
237	-452.689885
238	-441.419880
239	-427.651919
240	-0.000000
241	-1.990635
242	-0.000000
243	-0.000000
244	-460.635437
245	-445.082015
246	-434.901454
247	-450.237499
248	-7.012812
249	-1578.402828

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Coordenada y	Valor y
250	-25.016517
251	9.789188
252	10.582509
253	-0.000000
254	3.009238
255	47.724780
256	4.134624
257	4.887509
258	4.887509
259	4.887509
260	4.887509
261	4.101075
262	4.887509
263	17.960004
264	4.887509
265	4.887509
266	4.887509
267	4.887509
268	4.887509
269	4.887509
270	4.228846
271	1.165346
272	-0.000000
273	2.525987
274	-0.000000
275	17.646763
276	2.878074
277	6.562424
278	4.352011
279	0.490829
280	-3.397706
281	-0.000000
282	-2.958344
283	-0.000000
284	-0.000000
285	4.663335
286	0.800996
287	10.034243
288	9.431877
289	11.306308
290	-0.000000
291	-4.691633
292	-4.760724
293	-18.581210
294	-34.954651
295	-8.117425
296	-4.474300
297	-9.013047
298	-4.800363

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Coordenada y	Valor y
299	-95.316957
300	-11.866838
301	-20.440282
302	-12.734326
303	-23.513402
304	-26.445384
305	-28.886850
306	-9.652952
307	-0.608900
308	-2.064200
309	-0.000000
310	-5.640873
311	-0.000000
312	-103.866776
313	-9.816342
314	-0.103800
315	-16.893751
316	-16.538292
317	-0.000000
318	-0.000000
319	-0.268736
320	0.207208
321	-0.070451
322	-0.000000
323	-0.341160
324	-0.032200
325	0.125986
326	3.461160
327	-0.672122
328	-0.000000
329	-0.000000
330	0.058348
331	0.058348
332	0.058348
333	-0.000000
334	-0.000000
335	-0.000000
336	-1.003772
337	0.854079
338	-0.032485
339	-0.000000
340	-0.118733
341	3.009574
342	-0.000000
343	4.569867
344	43.393236
345	17.036001
346	17.862067
347	12.788407
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Coordenada y	Valor y
348	4.496283
349	0.263571
350	-0.000000
351	-0.000000
352	-0.000000
353	7.279973
354	6.749773
355	-0.000000
356	-0.452571
357	-0.000000
358	-0.053764
359	-0.000000
360	-0.462064
361	-0.000000
362	0.730664
363	-0.058348
364	0.058348
365	1.551483
366	2.314163
367	5.414877
368	4.275305
369	-1.415366
370	-0.000000
371	-0.598964
372	1.551483
373	1.270983
374	4.933192
375	5.436192
376	5.557243
377	0.340648
378	0.836159
379	-2.560387
380	-2.560387
381	-2.560387
382	-2.560387
383	-2.560387
384	-0.000000
385	-0.000000
386	0.000000
387	0.000000
388	-0.000000
389	-0.000000
390	-0.000000
391	-0.032429
392	-2.485127
393	-0.775742
394	-3.230381
395	-13.226893
396	-1.388498

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Coordenada y	Valor y
397	5.956365
398	-0.000000
399	-1.551483
400	-2.560387
401	-0.000000
402	-2.560387
403	-0.000000
404	-0.000000
405	-0.000000
406	-2.560387
407	0.000000
408	-2.560387
409	-0.000000
410	-2.560387
411	0.000000
412	-0.000000
413	-0.000000
414	-0.000000
415	-3.827725
416	-3.827725
417	-0.237790
418	-0.237790
419	-0.228593
420	-0.000000
421	1.262293
422	-0.000000
423	-0.000000
424	2.986345
425	2.149301
426	-0.000000
427	0.809899
428	14.342473
429	0.844209
430	5.005722
431	4.559501
432	4.559501
433	4.559501
434	3.871110
435	4.559501
436	13.213008
437	5.005722
438	5.005722
439	5.005722
440	5.005722
441	5.005722
442	4.602857
443	4.239818
444	0.898854
445	-0.000000

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Coordenada y	Valor y
446	1.281699
447	-0.000000
448	14.842673
449	1.212609
450	0.784278
451	-0.000000
452	-1.755347
453	-4.252617
454	-0.000000
455	-4.190344
456	-0.000000
457	2.467009
458	-0.000000
459	2.750374
460	4.068062
461	3.702729
462	5.343161
463	-0.000000
464	-4.212833
465	-4.318394
466	-6.290140
467	-8.277792
468	-3.272027
469	-1.795300
470	-4.226492
471	-2.105115
472	-27.454732
473	-6.979329
474	-5.005722
475	-7.206021
476	-8.894898
477	-9.546857
478	-10.478352
479	-4.659738
480	-0.124700
481	-0.898854
482	-0.000000
483	-1.670451
484	-3.183700
485	-31.336516
486	-2.183450
487	-0.021300
488	-6.378139
489	-6.377750
490	-6.290140
491	-8.277792
492	-3.272027
493	-1.795300
494	-4.226492

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Coordenada y	Valor y
495	-1.835778
496	-27.454732
497	-6.979329
498	-5.005722
499	-7.206021
500	-8.894898
501	-9.546857
502	-10.478352
503	-4.659738
504	-0.124700
505	-0.898854
506	-0.000000
507	-1.670451
508	-0.000000
509	-31.336516
510	-2.183450
511	-0.021300
512	-6.378139
513	-6.377750
514	-0.000000
515	-0.000000
516	-0.136897
517	0.207897
518	-0.070451
519	-0.000000
520	-0.187748
521	-0.021300
522	0.071514
523	0.008107
524	1.964664
525	0.222728
526	-0.076196
527	-0.000000
528	-0.000000
529	-0.000000
530	-0.000000
531	-0.000000
532	0.024021
533	0.032485
534	-0.000000
535	-0.000000
536	0.058348
537	0.004761
538	0.058348
539	0.004761
540	0.019260
541	-0.000000
542	-0.000000
543	-0.000000
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Coordenada y	Valor y
544	-0.000000
545	-0.384145
546	0.584945
547	-0.000000
548	-0.032485
549	-0.000000
550	-0.032485
551	1.220826
552	-0.000000
553	2.369210
554	12.384108
555	6.347271
556	6.315806
557	4.574186
558	2.470118
559	-0.000000
560	-0.000000
561	-0.000000
562	-0.000000
563	2.706633
564	2.574194
565	-0.000000
566	-0.124700
567	-0.000000
568	-0.000000
569	-0.000000
570	-0.332400
571	-0.000000
572	0.537700
573	-0.024021
574	0.024021
575	1.033049
576	1.623500
577	3.926617
578	2.856714
579	-1.693977
580	-0.000000
581	-0.343013
582	1.038352
583	0.862924
584	3.288233
585	3.455733
586	3.651445
587	0.329388
588	0.606519
589	-1.926595
590	-2.030376
591	-2.030376
592	-2.030376

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Coordenada y	Valor y
593	-2.030376
594	-0.000000
595	-0.000000
596	-0.110721
597	-0.110721
598	-0.110721
599	-0.110721
600	-0.000000
601	-0.015049
602	-1.174481
603	-0.516524
604	-2.262604
605	-11.214358
606	-0.974100
607	4.319279
608	-0.000000
609	-1.038352
610	-1.926595
611	-0.000000
612	-2.030376
613	-0.110721
614	-0.000000
615	-0.000000
616	-1.926595
617	-0.000000
618	-1.926595
619	-0.000000
620	-2.030376
621	-0.110721
622	-0.000000
623	-0.000000
624	-0.000000
625	-0.000000
626	-0.000000
627	-0.000000
628	-2.438832
629	-2.438832
630	-0.006694
631	-0.006694
632	-0.000000
633	-0.000000
634	-0.000000
635	-0.000000
636	-0.000000
637	0.070451
638	-0.000000
639	-0.000000
640	-0.000000
641	-0.000000

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Coordenada y	Valor y
642	-0.000000
643	-0.000000

4 Observações

- O solver HiGHS foi configurado com o método IPM (Interior Point Method).
- Este arquivo contém a solução detalhada para o problema bnl1.
- As variáveis duais representam os multiplicadores de Lagrange das restrições.
- Os custos reduzidos (z) indicam o impacto de forçar variáveis não-básicas na base.