

Solução do Problema grow22 - Solver HiGHS

Análise Computacional

17 de setembro de 2025

1 Informações do Problema

Informações do Problema:

- Nome: grow22
- Número de Variáveis: 645
- Número de Restrições: 300
- Inviabilidade Primal: 0.000e+00
- Inviabilidade Dual: 5.995e-12
- Valor Primal: -1.069e+08
- Valor Dual: 0.000e+00
- Gap: -5.871e-24
- Número de Iterações: 20

2 Variáveis Primais e Custos Reduzidos

Tabela 1: Variáveis primais e custos reduzidos do problema grow22

Coordenada x	Valor x	Coordenada z	Valor z
1	200054.672355	1	0.000000
2	4162.772912	2	0.000000
3	7844.966430	3	0.000000
4	4362.440527	4	0.000000
5	14005.208125	5	0.000000
6	26799.107272	6	0.000000
7	9181.788079	7	0.000000
8	11804.748174	8	0.000000
9	62908.000000	9	-61.532836
10	11736.297923	10	0.000000
11	13788.703058	11	0.000000
12	20160.238520	12	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
13	73148.996167	13	0.000000
14	79342.287936	14	0.000000
15	682.038617	15	0.000000
16	5766.994186	16	0.000000
17	17226.992073	17	0.000000
18	29854.081539	18	0.000000
19	10932.523745	19	0.000000
20	759331.120301	20	0.000000
21	0.000000	21	4.229781
22	0.000000	22	3.000000
23	0.000000	23	0.690552
24	123420.062020	24	0.000000
25	963.845388	25	0.000000
26	0.000000	26	-0.000000
27	0.000000	27	-0.000000
28	0.000000	28	0.000000
29	0.000000	29	0.000000
30	0.000000	30	0.000000
31	0.000000	31	-0.000000
32	26991.348157	32	0.000000
33	0.000000	33	-0.000000
34	0.000000	34	-0.000000
35	6204.413128	35	0.000000
36	47751.790631	36	0.000000
37	0.000000	37	-0.000000
38	0.000000	38	0.000000
39	0.000000	39	0.000000
40	0.000000	40	0.000000
41	16579.500000	41	-0.000000
42	2658.187345	42	0.000000
43	552363.000000	43	-0.000000
44	1004509.056733	44	0.000000
45	0.000000	45	0.000000
46	1321937.029826	46	0.000000
47	5161.857613	47	0.000000
48	45510.806542	48	0.000000
49	87272.226040	49	0.000000
50	17364.830334	50	0.000000
51	11249.476394	51	0.000000
52	62908.000000	52	-61.532836
53	34040.000000	53	-0.000000
54	21509.140314	54	0.000000
55	0.000000	55	0.000000
56	0.000000	56	-0.000000
57	115540.064213	57	0.000000
58	3025.194264	58	0.000000
59	9903.770084	59	0.000000
60	31901.652355	60	0.000000
61	0.000000	61	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
62	22639.000000	62	0.000000
63	35496.479314	63	0.000000
64	750000.000000	64	-1.770219
65	0.000000	65	0.000000
66	1000000.000000	66	-1.309448
67	34479.567218	67	0.000000
68	0.000000	68	-0.000000
69	265514.738054	69	0.000000
70	0.000000	70	0.000000
71	0.000000	71	-0.000000
72	0.000000	72	-0.000000
73	3095.537419	73	0.000000
74	0.000000	74	-0.000000
75	11530.251579	75	0.000000
76	8634.283264	76	0.000000
77	0.000000	77	0.000000
78	0.000000	78	0.000000
79	43956.332396	79	0.000000
80	0.000000	80	-0.000000
81	2960.500000	81	0.000000
82	8665.500000	82	0.000000
83	0.000000	83	-0.000000
84	0.000000	84	0.000000
85	11319.500000	85	0.000000
86	178837.115895	86	0.000000
87	0.000000	87	0.000000
88	603688.045960	88	0.000000
89	768792.417035	89	0.000000
90	7498.873602	90	0.000000
91	31949.108732	91	0.000000
92	77804.625541	92	0.000000
93	66657.000000	93	0.000000
94	23692.657771	94	0.000000
95	62908.000000	95	-61.532836
96	26436.037067	96	0.000000
97	41181.000000	97	-0.000000
98	24114.628505	98	0.000000
99	0.000000	99	-0.000000
100	247419.870482	100	0.000000
101	0.000000	101	0.000000
102	0.000000	102	0.000000
103	54110.574746	103	0.000000
104	33159.000000	104	0.000000
105	2415.133306	105	0.000000
106	150979.517703	106	0.000000
107	0.000000	107	4.229781
108	500000.000000	108	-3.000000
109	1000000.000000	109	-3.309448
110	0.000000	110	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
111	3891.304627	111	0.000000
112	0.000000	112	0.000000
113	0.000000	113	0.000000
114	0.000000	114	0.000000
115	59464.500000	115	0.000000
116	33328.500000	116	0.000000
117	4737.562010	117	0.000000
118	8947.624256	118	0.000000
119	17020.000000	119	-0.000000
120	3031.695443	120	0.000000
121	2111.930636	121	0.000000
122	38669.264543	122	0.000000
123	89393.331102	123	0.000000
124	2782.289883	124	0.000000
125	7187.517886	125	0.000000
126	25815.872331	126	0.000000
127	0.000000	127	-0.000000
128	5814.053018	128	0.000000
129	0.000000	129	-0.000000
130	1101673.827224	130	0.000000
131	0.000000	131	0.000000
132	1031917.543681	132	0.000000
133	3899.949987	133	0.000000
134	41657.764233	134	0.000000
135	24738.604122	135	0.000000
136	4801.984753	136	0.000000
137	0.000000	137	0.000000
138	62908.000000	138	-61.532836
139	7109.173328	139	0.000000
140	6647.859805	140	0.000000
141	0.000000	141	0.000000
142	0.000000	142	-0.000000
143	0.000000	143	-0.000000
144	0.000000	144	0.000000
145	0.000000	145	0.000000
146	0.000000	146	-0.000000
147	17728.402565	147	0.000000
148	0.000000	148	0.000000
149	400583.868301	149	0.000000
150	750000.000000	150	-1.770219
151	0.000000	151	0.000000
152	1000000.000000	152	-5.309448
153	0.000000	153	0.000000
154	2372.730670	154	0.000000
155	0.000000	155	0.000000
156	0.000000	156	-0.000000
157	0.000000	157	0.000000
158	0.000000	158	0.000000
159	29643.372526	159	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
160	0.000000	160	0.000000
161	0.000000	161	0.000000
162	0.000000	162	0.000000
163	0.000000	163	0.000000
164	0.000000	164	-0.000000
165	35633.148625	165	0.000000
166	0.000000	166	0.000000
167	2430.977831	167	0.000000
168	4009.341549	168	0.000000
169	0.000000	169	0.000000
170	0.000000	170	0.000000
171	0.000000	171	0.000000
172	0.000000	172	0.000000
173	47196.136700	173	0.000000
174	0.000000	174	-0.000000
175	1044595.321539	175	0.000000
176	5597.473478	176	0.000000
177	38385.222570	177	0.000000
178	12070.675404	178	0.000000
179	14780.991307	179	0.000000
180	24668.473496	180	0.000000
181	62908.000000	181	-61.532836
182	29240.715213	182	0.000000
183	28462.473980	183	0.000000
184	16715.076353	184	0.000000
185	0.000000	185	-0.000000
186	234159.478701	186	0.000000
187	0.000000	187	0.000000
188	0.000000	188	0.000000
189	19412.333237	189	0.000000
190	19507.522498	190	0.000000
191	11498.432096	191	0.000000
192	529287.520782	192	0.000000
193	0.000000	193	4.229781
194	0.000000	194	3.000000
195	1000000.000000	195	-3.309448
196	21222.607860	196	0.000000
197	0.000000	197	0.000000
198	0.000000	198	0.000000
199	0.000000	199	0.000000
200	0.000000	200	0.000000
201	0.000000	201	-0.000000
202	33328.500000	202	0.000000
203	6280.785272	203	0.000000
204	14087.067096	204	0.000000
205	17020.000000	205	0.000000
206	0.000000	206	0.000000
207	0.000000	207	0.000000
208	29537.018183	208	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
209	98105.771190	209	0.000000
210	1949.489017	210	0.000000
211	0.000000	211	-0.000000
212	0.000000	212	-0.000000
213	0.000000	213	0.000000
214	0.000000	214	0.000000
215	183570.341843	215	0.000000
216	1115621.555056	216	0.000000
217	131903.365820	217	0.000000
218	1053837.629249	218	0.000000
219	4814.646592	219	0.000000
220	42894.466773	220	0.000000
221	118929.000000	221	-0.000000
222	0.000000	222	0.000000
223	0.000000	223	0.000000
224	62908.000000	224	-61.532836
225	10025.033469	225	0.000000
226	13102.953327	226	0.000000
227	4526.506571	227	0.000000
228	0.000000	228	-0.000000
229	0.000000	229	-0.000000
230	0.000000	230	0.000000
231	2170.037430	231	0.000000
232	33368.640291	232	0.000000
233	33159.000000	233	-0.000000
234	9949.345795	234	0.000000
235	228497.730695	235	0.000000
236	750000.000000	236	-1.770219
237	0.000000	237	0.000000
238	1000000.000000	238	-1.309448
239	0.000000	239	0.000000
240	108238.579780	240	0.000000
241	18085.947895	241	0.000000
242	0.000000	242	0.000000
243	0.000000	243	-0.000000
244	16979.168132	244	0.000000
245	25918.999302	245	0.000000
246	0.000000	246	-0.000000
247	0.000000	247	0.000000
248	0.000000	248	0.000000
249	0.000000	249	0.000000
250	0.000000	250	0.000000
251	26616.495061	251	0.000000
252	0.000000	252	-0.000000
253	1721.767591	253	0.000000
254	0.000000	254	0.000000
255	0.000000	255	0.000000
256	10481.334889	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	-0.000000
259	172635.603170	259	0.000000
260	467734.087685	260	0.000000
261	0.000000	261	0.000000
262	9092.000000	262	0.000000
263	58114.590563	263	0.000000
264	48316.625192	264	0.000000
265	0.000000	265	0.000000
266	30725.000000	266	-0.000000
267	62908.000000	267	-61.532836
268	34040.000000	268	0.000000
269	17781.838468	269	0.000000
270	29482.000000	270	0.000000
271	0.000000	271	-0.000000
272	93543.129291	272	0.000000
273	0.000000	273	0.000000
274	7548.573454	274	0.000000
275	28839.859752	275	0.000000
276	8480.975519	276	0.000000
277	11169.188653	277	0.000000
278	174757.132913	278	0.000000
279	0.000000	279	4.229781
280	500000.000000	280	-3.000000
281	0.000000	281	0.690552
282	100216.108264	282	0.000000
283	0.000000	283	0.000000
284	0.000000	284	0.000000
285	2320.397391	285	0.000000
286	48526.574755	286	0.000000
287	41141.072023	287	0.000000
288	19172.144971	288	0.000000
289	15362.500000	289	0.000000
290	16161.832063	290	0.000000
291	17020.000000	291	-0.000000
292	0.000000	292	-0.000000
293	10646.381647	293	0.000000
294	23339.204223	294	0.000000
295	0.000000	295	0.000000
296	1544.324481	296	0.000000
297	5745.708023	297	0.000000
298	7981.911131	298	0.000000
299	0.000000	299	0.000000
300	4371.740196	300	0.000000
301	0.000000	301	0.000000
302	1017246.427218	302	0.000000
303	36380.873883	303	0.000000
304	1037695.965139	304	0.000000
305	3406.043444	305	0.000000
306	0.000000	306	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
307	118929.000000	307	-0.000000
308	0.000000	308	0.000000
309	11938.053340	309	0.000000
310	62908.000000	310	-61.532836
311	10021.246996	311	0.000000
312	20851.942165	312	0.000000
313	16509.580530	313	0.000000
314	0.000000	314	-0.000000
315	130963.223388	315	0.000000
316	0.000000	316	0.000000
317	0.000000	317	0.000000
318	61931.000000	318	0.000000
319	24331.521484	319	0.000000
320	22639.000000	320	-0.000000
321	760487.807562	321	0.000000
322	750000.000000	322	-1.770219
323	0.000000	323	-0.000000
324	1000000.000000	324	-1.309448
325	6390.012611	325	0.000000
326	28098.049929	326	0.000000
327	0.000000	327	0.000000
328	0.000000	328	0.000000
329	0.000000	329	0.000000
330	59464.500000	330	0.000000
331	11137.146646	331	0.000000
332	11724.947727	332	0.000000
333	0.000000	333	0.000000
334	0.000000	334	0.000000
335	0.000000	335	0.000000
336	14741.000000	336	0.000000
337	16123.173514	337	0.000000
338	0.000000	338	0.000000
339	825.869406	339	0.000000
340	0.000000	340	-0.000000
341	30965.500000	341	-0.000000
342	0.000000	342	0.000000
343	11319.500000	343	0.000000
344	263999.053179	344	0.000000
345	0.000000	345	-0.000000
346	0.000000	346	-0.000000
347	1043263.209241	347	0.000000
348	6243.664606	348	0.000000
349	111908.961617	349	0.000000
350	2306.536350	350	0.000000
351	0.000000	351	0.000000
352	0.000000	352	-0.000000
353	62908.000000	353	-61.532836
354	27419.535584	354	0.000000
355	36472.216542	355	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
356	7474.344380	356	0.000000
357	0.000000	357	-0.000000
358	330075.236472	358	0.000000
359	0.000000	359	0.000000
360	350.609822	360	0.000000
361	11771.947567	361	0.000000
362	14634.777369	362	0.000000
363	9565.066005	363	0.000000
364	0.000000	364	-0.000000
365	0.000000	365	4.229781
366	0.000000	366	3.000000
367	1000000.000000	367	-3.309448
368	0.000000	368	0.000000
369	25922.198147	369	0.000000
370	0.000000	370	0.000000
371	0.000000	371	0.000000
372	80622.924771	372	0.000000
373	59464.500000	373	0.000000
374	6484.816987	374	0.000000
375	0.000000	375	0.000000
376	16911.976266	376	0.000000
377	17020.000000	377	0.000000
378	0.000000	378	0.000000
379	4202.994946	379	0.000000
380	11127.305942	380	0.000000
381	177849.764870	381	0.000000
382	814.247729	382	0.000000
383	0.000000	383	0.000000
384	25988.782156	384	0.000000
385	0.000000	385	-0.000000
386	11319.500000	386	0.000000
387	0.000000	387	0.000000
388	1108130.072234	388	0.000000
389	0.000000	389	-0.000000
390	1032264.109237	390	0.000000
391	3703.713700	391	0.000000
392	0.000000	392	-0.000000
393	30126.052466	393	0.000000
394	0.000000	394	0.000000
395	11572.117733	395	0.000000
396	62908.000000	396	-61.532836
397	7222.529261	397	0.000000
398	9593.000748	398	0.000000
399	0.000000	399	-0.000000
400	0.000000	400	-0.000000
401	0.000000	401	-0.000000
402	276.342893	402	0.000000
403	10024.926106	403	0.000000
404	0.000000	404	-0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
405	33159.000000	405	-0.000000
406	1560.068833	406	0.000000
407	396406.956864	407	0.000000
408	750000.000000	408	-1.770219
409	0.000000	409	-0.000000
410	1000000.000000	410	-5.309448
411	2988.734520	411	0.000000
412	23369.558314	412	0.000000
413	0.000000	413	0.000000
414	0.000000	414	0.000000
415	38191.371660	415	0.000000
416	3610.607733	416	0.000000
417	0.000000	417	-0.000000
418	3691.415897	418	0.000000
419	7678.260671	419	0.000000
420	0.000000	420	-0.000000
421	0.000000	421	0.000000
422	3104.935176	422	0.000000
423	7732.848628	423	0.000000
424	99329.668368	424	0.000000
425	742.325752	425	0.000000
426	6392.097090	426	0.000000
427	0.000000	427	-0.000000
428	13421.542233	428	0.000000
429	5779.080718	429	0.000000
430	0.000000	430	-0.000000
431	0.000000	431	0.000000
432	569123.925799	432	0.000000
433	1035907.519582	433	0.000000
434	2899.078823	434	0.000000
435	0.000000	435	0.000000
436	0.000000	436	0.000000
437	24283.461135	437	0.000000
438	0.000000	438	0.000000
439	62908.000000	439	-61.532836
440	14872.250007	440	0.000000
441	19285.127940	441	0.000000
442	0.000000	442	0.000000
443	0.000000	443	-0.000000
444	0.000000	444	0.000000
445	0.000000	445	0.000000
446	0.000000	446	0.000000
447	15478.817562	447	0.000000
448	17201.722546	448	0.000000
449	0.000000	449	0.000000
450	339465.054020	450	0.000000
451	0.000000	451	4.229781
452	500000.000000	452	-3.000000
453	1000000.000000	453	-3.309448

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Coordenada x	Valor x	Coordenada z	Valor z
454	0.000000	454	-0.000000
455	0.000000	455	0.000000
456	0.000000	456	-0.000000
457	0.000000	457	0.000000
458	0.000000	458	-0.000000
459	0.000000	459	-0.000000
460	8027.292292	460	0.000000
461	0.000000	461	-0.000000
462	18910.643328	462	0.000000
463	0.000000	463	-0.000000
464	0.000000	464	0.000000
465	0.000000	465	0.000000
466	5690.961593	466	0.000000
467	0.000000	467	-0.000000
468	431.937748	468	0.000000
469	3632.851047	469	0.000000
470	0.000000	470	-0.000000
471	0.000000	471	-0.000000
472	0.000000	472	0.000000
473	0.000000	473	-0.000000
474	1143475.650328	474	0.000000
475	6074.064447	475	0.000000
476	1044166.674666	476	0.000000
477	6358.368710	477	0.000000
478	45065.246723	478	0.000000
479	103570.250268	479	0.000000
480	0.000000	480	0.000000
481	14876.956310	481	0.000000
482	62908.000000	482	-61.532836
483	28452.996089	483	0.000000
484	20970.951701	484	0.000000
485	11359.992408	485	0.000000
486	0.000000	486	-0.000000
487	130465.839134	487	0.000000
488	0.000000	488	0.000000
489	0.000000	489	0.000000
490	37223.198627	490	0.000000
491	20936.779498	491	0.000000
492	11180.322027	492	0.000000
493	456863.345200	493	0.000000
494	750000.000000	494	-1.770219
495	2838.972391	495	0.000000
496	1000000.000000	496	-1.309448
497	0.000000	497	2.136247
498	0.000000	498	1.633909
499	0.000000	499	0.690552
500	0.000000	500	2.510975
501	0.000000	501	1.341249
502	0.000000	502	1.698374

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Coordenada x	Valor x	Coordenada z	Valor z
503	0.000000	503	5.071527
504	0.000000	504	3.566481
505	0.000000	505	34.995834
506	0.000000	506	1.373960
507	0.000000	507	1.352918
508	0.000000	508	1.994298
509	0.000000	509	2.092297
510	0.000000	510	2.272956
511	0.000000	511	0.506360
512	0.000000	512	0.431527
513	0.000000	513	0.581896
514	0.000000	514	0.439634
515	0.000000	515	0.268428
516	0.000000	516	0.454548
517	6443.241389	517	0.000000
518	159910.171683	518	0.000000
519	81351.468159	519	0.000000
520	4244.429268	520	0.000000
521	7169.755941	521	0.000000
522	2918.801784	522	0.000000
523	25255.444938	523	0.000000
524	7565.500969	524	0.000000
525	62908.000000	525	-36.398072
526	7903.274654	526	0.000000
527	13214.432308	527	0.000000
528	21702.332782	528	0.000000
529	11481.524672	529	0.000000
530	100798.138967	530	0.000000
531	590.542995	531	0.000000
532	856.783782	532	0.000000
533	44084.234775	533	0.000000
534	14389.485735	534	0.000000
535	3909.507028	535	0.000000
536	94828.014031	536	0.000000
537	0.000000	537	2.093535
538	0.000000	538	1.366091
539	74542.993816	539	0.000000
540	0.000000	540	-0.000000
541	132914.435743	541	0.000000
542	0.000000	542	0.000000
543	0.000000	543	0.000000
544	0.000000	544	-0.000000
545	0.000000	545	-0.000000
546	10649.055520	546	0.000000
547	0.000000	547	-0.000000
548	31454.000000	548	-0.000000
549	0.000000	549	0.000000
550	0.000000	550	0.000000
551	7999.377777	551	0.000000

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Coordenada x	Valor x	Coordenada z	Valor z
552	5595.356594	552	0.000000
553	48419.462362	553	0.000000
554	469.352729	554	0.000000
555	0.000000	555	0.000000
556	30965.500000	556	0.000000
557	4080.466088	557	0.000000
558	0.000000	558	0.000000
559	0.000000	559	0.000000
560	1143964.874197	560	0.000000
561	440451.256737	561	0.000000
562	1047246.497498	562	0.000000
563	6332.005002	563	0.000000
564	49338.364139	564	0.000000
565	104428.191069	565	0.000000
566	0.000000	566	0.000000
567	14782.558964	567	0.000000
568	62908.000000	568	-36.398072
569	34040.000000	569	0.000000
570	26898.838176	570	0.000000
571	0.000000	571	-0.000000
572	0.000000	572	-0.000000
573	113010.472561	573	0.000000
574	0.000000	574	-0.000000
575	4393.763435	575	0.000000
576	7622.260211	576	0.000000
577	33159.000000	577	-0.000000
578	12272.888841	578	0.000000
579	527288.523286	579	0.000000
580	750000.000000	580	-3.906465
581	500000.000000	581	-1.633909
582	1000000.000000	582	-2.000000
583	0.000000	583	2.093535
584	0.000000	584	1.587742
585	0.000000	585	0.672610
586	0.000000	586	2.443479
587	0.000000	587	1.311972
588	0.000000	588	1.662287
589	0.000000	589	4.971262
590	0.000000	590	3.491507
591	0.000000	591	34.346549
592	0.000000	592	1.342496
593	0.000000	593	1.313825
594	0.000000	594	1.940345
595	0.000000	595	2.046812
596	0.000000	596	2.224256
597	0.000000	597	0.493444
598	0.000000	598	0.421178
599	0.000000	599	0.567595
600	2702.415633	600	0.000000

Continua na próxima página

Coordenada x	Valor x	Coordenada z	Valor z
601	0.000000	601	0.260067
602	0.000000	602	0.441101
603	64279.833916	603	0.000000
604	598682.282165	604	0.000000
605	1040066.585759	605	0.000000
606	6245.985605	606	0.000000
607	41615.180540	607	0.000000
608	11644.323310	608	0.000000
609	13901.785008	609	0.000000
610	12343.271987	610	0.000000
611	62908.000000	611	-11.721452
612	18987.994988	612	0.000000
613	33492.208284	613	0.000000
614	16359.351566	614	0.000000
615	6697.081657	615	0.000000
616	157290.684424	616	0.000000
617	373.551499	617	0.000000
618	3417.770405	618	0.000000
619	23853.144010	619	0.000000
620	33159.000000	620	-0.377360
621	11560.735356	621	0.000000
622	401641.258698	622	0.000000
623	35042.410196	623	0.000000
624	500000.000000	624	-6.221651
625	1000000.000000	625	-4.672610
626	0.000000	626	1.000000
627	0.000000	627	0.778349
628	0.000000	628	0.327390
629	0.000000	629	1.192707
630	0.000000	630	0.630313
631	0.000000	631	0.797157
632	0.000000	632	2.372902
633	0.000000	633	1.673174
634	0.000000	634	16.331505
635	0.000000	635	0.647158
636	0.000000	636	0.645359
637	0.000000	637	0.947632
638	0.000000	638	0.983079
639	0.000000	639	1.067249
640	0.000000	640	0.239824
641	0.000000	641	0.203723
642	0.000000	642	0.275058
643	0.000000	643	0.636641
644	0.000000	644	0.128648
645	0.000000	645	0.217138

3 Variáveis Duais (Multiplicadores de Lagrange)

Tabela 2: Variáveis duais do problema grow22

Coordenada y	Valor y
1	5.229781
2	4.000000
3	1.690552
4	6.147161
5	3.283533
6	4.157817
7	12.415691
8	8.731162
9	85.673889
10	3.363614
11	3.312102
12	4.882275
13	5.122188
14	5.564461
15	1.239628
16	1.056428
17	1.424549
18	1.076274
19	0.657143
20	1.112787
21	5.229781
22	4.000000
23	1.690552
24	6.147161
25	3.283533
26	4.157817
27	12.415691
28	8.731162
29	85.673889
30	3.363614
31	3.312102
32	4.882275
33	5.122188
34	5.564461
35	1.239628
36	1.056428
37	1.424549
38	1.076274
39	0.657143
40	1.112787
41	5.229781
42	4.000000
43	1.690552
44	6.147161
45	3.283533
46	4.157817
Continua na próxima página	

Coordenada y	Valor y
47	12.415691
48	8.731162
49	85.673889
50	3.363614
51	3.312102
52	4.882275
53	5.122188
54	5.564461
55	1.239628
56	1.056428
57	1.424549
58	1.076274
59	0.657143
60	1.112787
61	5.229781
62	4.000000
63	1.690552
64	6.147161
65	3.283533
66	4.157817
67	12.415691
68	8.731162
69	85.673889
70	3.363614
71	3.312102
72	4.882275
73	5.122188
74	5.564461
75	1.239628
76	1.056428
77	1.424549
78	1.076274
79	0.657143
80	1.112787
81	5.229781
82	4.000000
83	1.690552
84	6.147161
85	3.283533
86	4.157817
87	12.415691
88	8.731162
89	85.673889
90	3.363614
91	3.312102
92	4.882275
93	5.122188
94	5.564461
95	1.239628
Continua na próxima página	

Coordenada y	Valor y
96	1.056428
97	1.424549
98	1.076274
99	0.657143
100	1.112787
101	5.229781
102	4.000000
103	1.690552
104	6.147161
105	3.283533
106	4.157817
107	12.415691
108	8.731162
109	85.673889
110	3.363614
111	3.312102
112	4.882275
113	5.122188
114	5.564461
115	1.239628
116	1.056428
117	1.424549
118	1.076274
119	0.657143
120	1.112787
121	5.229781
122	4.000000
123	1.690552
124	6.147161
125	3.283533
126	4.157817
127	12.415691
128	8.731162
129	85.673889
130	3.363614
131	3.312102
132	4.882275
133	5.122188
134	5.564461
135	1.239628
136	1.056428
137	1.424549
138	1.076274
139	0.657143
140	1.112787
141	5.229781
142	4.000000
143	1.690552
144	6.147161
Continua na próxima página	

Coordenada y	Valor y
145	3.283533
146	4.157817
147	12.415691
148	8.731162
149	85.673889
150	3.363614
151	3.312102
152	4.882275
153	5.122188
154	5.564461
155	1.239628
156	1.056428
157	1.424549
158	1.076274
159	0.657143
160	1.112787
161	5.229781
162	4.000000
163	1.690552
164	6.147161
165	3.283533
166	4.157817
167	12.415691
168	8.731162
169	85.673889
170	3.363614
171	3.312102
172	4.882275
173	5.122188
174	5.564461
175	1.239628
176	1.056428
177	1.424549
178	1.076274
179	0.657143
180	1.112787
181	5.229781
182	4.000000
183	1.690552
184	6.147161
185	3.283533
186	4.157817
187	12.415691
188	8.731162
189	85.673889
190	3.363614
191	3.312102
192	4.882275
193	5.122188
Continua na próxima página	

Coordenada y	Valor y
194	5.564461
195	1.239628
196	1.056428
197	1.424549
198	1.076274
199	0.657143
200	1.112787
201	5.229781
202	4.000000
203	1.690552
204	6.147161
205	3.283533
206	4.157817
207	12.415691
208	8.731162
209	85.673889
210	3.363614
211	3.312102
212	4.882275
213	5.122188
214	5.564461
215	1.239628
216	1.056428
217	1.424549
218	1.076274
219	0.657143
220	1.112787
221	5.229781
222	4.000000
223	1.690552
224	6.147161
225	3.283533
226	4.157817
227	12.415691
228	8.731162
229	85.673889
230	3.363614
231	3.312102
232	4.882275
233	5.122188
234	5.564461
235	1.239628
236	1.056428
237	1.424549
238	1.076274
239	0.657143
240	1.112787
241	3.093535
242	2.366091

Continua na próxima página

Coordenada y	Valor y
243	1.000000
244	3.636185
245	1.942285
246	2.459443
247	7.344164
248	5.164681
249	50.678054
250	1.989654
251	1.959184
252	2.887977
253	3.029891
254	3.291505
255	0.733268
256	0.624901
257	0.842653
258	0.636641
259	0.388715
260	0.658239
261	3.093535
262	2.366091
263	1.000000
264	3.636185
265	1.942285
266	2.459443
267	7.344164
268	5.164681
269	50.678054
270	1.989654
271	1.959184
272	2.887977
273	3.029891
274	3.291505
275	0.733268
276	0.624901
277	0.842653
278	0.636641
279	0.388715
280	0.658239
281	1.000000
282	0.778349
283	0.327390
284	1.192707
285	0.630313
286	0.797157
287	2.372902
288	1.673174
289	16.331505
290	0.647158
291	0.645359
Continua na próxima página	

Coordenada y	Valor y
292	0.947632
293	0.983079
294	1.067249
295	0.239824
296	0.203723
297	0.275058
298	0.636641
299	0.128648
300	0.217138

4 Observações

- O solver HiGHS foi configurado com o método IPM (Interior Point Method).
- Este arquivo contém a solução detalhada para o problema grow22.
- As variáveis duais representam os multiplicadores de Lagrange das restrições.
- Os custos reduzidos (z) indicam o impacto de forçar variáveis não-básicas na base.