INTRODUCTION TO LINEAR OPTIMIZATION
Dimitris Bertsimas and **John N. Tsitsiklis**

Errata sheet
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Some of the errors in earlier printings have been corrected in subsequent printings. The errata below are organized accordingly. Books from the 2nd printing (for example) can be identified by the entry "Second printing" below the ISBN number in the copyright page (the fourth page in the front matter), just before the dedication page.

Errata in the third and subsequent printings

p. 22, Figure 1.3: replace the strict inequality signs "$<$" in the figure with "$\leq$"

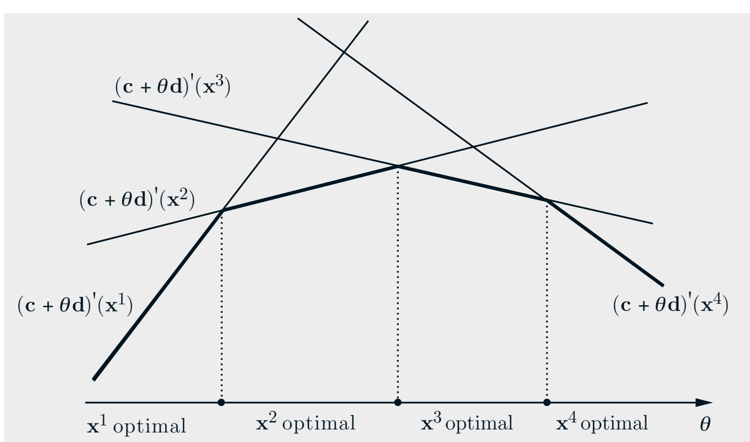
p. 77, Exercise 2.8: replace last sentence with the following. "Show that a certain basis $\mathbf{A}_{B(1)}, \ldots, \mathbf{A}_{B(m)}$ leads to the basic solution $\mathbf{x}$ (i.e., that $\sum_{i=1}^{m} \mathbf{A}_{B(i)} x_i = \mathbf{b}$) if and only if every column $\mathbf{A}_i$, $i \in J$, is in the basis (i.e., if and only if $J \subset \{B(1), \ldots, B(m)\}$)."

p. 189, l. -3: replace "prive" with "price"

p. 190, Exercise 4.12: "nondegenerate basic feasible solution to the primal" should be "nondegenerate basic feasible solution to the primal in which all free variables are nonzero."

p. 195, Exercise 4.32(c), l. 5: replace "$\mathbf{e}'\mathbf{y} \leq 1$" with "$\mathbf{e}'\mathbf{x} \leq 1$"

p. 218, Figure 5.3: In some copies of the 6th printing, this figure is missing:



p. 223, l. 1: $\mathbf{A}_0 + \delta\mathbf{A_1}$ should be $\mathbf{A}_1 + \delta\mathbf{A_0}$

p. 224, Exercise 5.6(e): replace “maximum decrease” with “mimimum decrease”

p. 259, in the displayed equation in item 4, z_ω^* should be z_ω

p. 320, last line before Theorem 7.13: replace “results” with “result”

p. 328, l. 2: replace “objects” with “projects”

p. 342, l. −9: replace “smaller than n,” with “smaller than n^2,”

p. 510, l. −5: delete the extra “the”

Errata in the first and second printing, corrected in subsequent printings.

p. 27, l. −11, replace “Schwartz” by “Schwarz”

p. 69, l. −13: “$\mathbf{a}_{i^*}'\mathbf{x} = b_i$” should be “$\mathbf{a}_{i^*}'\mathbf{x} = b_{i^*}$”

p. 126, l. 16, replace “inequality constraints” with “linear inequality constraints”

p. 153, l. −8, replace $\mathbf{a}_i'\mathbf{x} \neq b_i$ by $\mathbf{a}_i'\mathbf{x}^I \neq b_i$

p. 163, Example 4.9, first line: replace “from” with “form”

p. 165, l. 11, replace $\mathbf{p}'\mathbf{A}\mathbf{x} \geq \mathbf{0}$ with $\mathbf{p}'\mathbf{A}\mathbf{x} \geq 0$

p. 175, l. 1, replace “To this see” with “To see this”

p. 203, l. 12: replace $\mathbf{x} \geq \mathbf{0}$ with $\mathbf{x} \geq \mathbf{0},\ x_{n+1} \geq 0$

p. 216, l. −6: replace “$\leq \mathbf{c}\}$” with “$\leq \mathbf{c}'\}$”

p. 216, l. −3: replace $\mathbf{c}'$ with $(\mathbf{c}^1)'$

p. 216, l. −2: replace $\mathbf{c}'$ with $(\mathbf{c}^2)'$

p. 216, l. −1: right-hand side should be $\lambda(\mathbf{c}^1)' + (1-\lambda)(\mathbf{c}^2)'$

p. 220, l. −12: replace “added to the pivot row” with “added to the zeroth row”

p. 238, Fig. 6.1, caption, 6th line: replace “thatched” with “hatched”

p. 239, l. 1: replace “thatched” with “hatched”

p. 249, first displayed equation should read

$$\sum_{j=1}^{3} \lambda_1^j \mathbf{D}_1 \mathbf{x}_1^j + \sum_{k=1}^{2} \theta_1^k \mathbf{D}_1 \mathbf{w}_1^k + x_3 \;=\; 8$$

p. 264, last line: “Wosley” should be “Wolsey”

p. 281, caption: replace “thatched” with “hatched”

p. 304, caption: replace “thatched” with “hatched”

p. 305, 2nd and 4th line of Example 7.5: replace "thatched" with "hatched"

p. 349, replace part (d) of Exercise 7.10 with: "Does there exist a nondegenerate optimal basic feasible solution?"

p. 373, Lemma 8.2, 2nd line, replace $\Re^n$ with $\Re^m$

p. 447, l. 5, replace $\mathbf{z}^t = \sum_{j=1}^{t}$ with $\mathbf{z}^t = \sum_{j=1}^{n}$

p. 480, l. 5, delete the second "that"

p. 483, l. −9: the equation should read

$$x_2 + \frac{1}{10}x_3 + \frac{4}{10}x_4 = \frac{25}{10.}$$

p. 506, replace Table 11.1 with the following:

t	p^t	s^t	$Z(p^t)$
1	5.00	−3	−9.00
2	2.60	−2	−2.20
3	1.32	1	−0.68
4	1.83	−2	−0.66
5	1.01	1	−0.99
6	1.34	1	−0.66
7	1.60	1	−0.40
8	1.81	−2	−0.62
9	1.48	1	−0.52
10	1.61	1	−0.39

p. 516, l. −4: replace "equivalent to I_3" with "equivalent to I_2"

p. 567, l. −16, "Schultz" should be "Schulz"

p. 574, l. 5, "Schultz" should be "Schulz"

p. 577, l. 20, "Schultz" should be "Schulz"

p. 585, "Schwartz" should be "Schwarz"

Errata in the first printing, corrected in subsequent printings.

p. 35, Exercise 1.9, line 3: "grade i" should be "grade g"

p. 38, Exercise 1.20(a): Rewrite as follows: "Let $S = \{\mathbf{Ax} \mid \mathbf{x} \in \Re^n\}$, where $\mathbf{A}$ is a given $m \times n$ matrix. Show that S is a subspace of $\Re^m$."

p. 43, rewrite last sentence of first paragraph as follows: "In particular, a set of the form $\{\mathbf{x} \in \Re^n \mid \mathbf{Ax} = \mathbf{b},\ \mathbf{x} \geq \mathbf{0}\}$ is also a polyhedron, in a *standard form representation.*"

p. 76, Exercise 2.3: Assume that $u_i > 0$ for all i.

p. 129, Exercise 3.4: "Replace "$\mathbf{Ex}^* < \mathbf{g}$" with "$(\mathbf{Ex}^*)_i < (\mathbf{g})_i$ for all i."

p. 130, Exercise 3.8: Replace with the following.

"This exercise deals with the problem of deciding whether a given degenerate basic feasible solution is optimal and shows that this is essentially as hard as solving a general linear programming problem.

Consider the linear programming problem of minimizing $\mathbf{c}'\mathbf{x}$ over all $\mathbf{x} \in P$, where $P = \{\mathbf{x} \in \Re^n \mid \mathbf{Ax} \leq \mathbf{b}\}$ is a given bounded and nonempty polyhedron. Let

$$Q = \big\{(\mathbf{x}, t) \in \Re^{n+1} \;\big|\; \mathbf{Ax} \leq t\mathbf{b},\ t \in [0,1]\big\}.$$

(a) Give an example of P and Q, with $n = 2$, for which the zero vector (in $\Re^{n+1}$) is a degenerate basic feasible solution in Q; show the example in a figure.

(b) Show that the zero vector (in $\Re^{n+1}$) minimizes $(\mathbf{c}, 0)'\mathbf{y}$ over all $\mathbf{y} \in Q$ if and only if the optimal cost in the original linear programming problem is greater than or equal to zero."

p. 133, Exercise 3.18(e): Replace with "If $\mathbf{x}$ is an optimal solution found by the simplex method, no more than m of its components can be positive, where m is the number of equality constraints."

p. 134, Exercise 3.20(b): Replace with "The first row in the present tableau (below the row with the reduced costs) indicates that the problem is infeasible."

p. 135, Exercise 3.25. Replace last sentence of part (a) with "Also, show that it is nondegenerate if and only if $x_i \neq 0$ and $x_i \neq u_i$ for every basic variable x_i."

p. 142, first displayed equation: replace $\mathbf{0}$ with $\mathbf{b}$.

p. 188. Exercise 4.6(a): Replace $\sum_{i=1}^m p_i = 1$ with $\sum_{i=1}^m p_i \leq 1$

p. 191, Exercise 4.13(b): Replace "one of the basic" with "one of the nonbasic"

p. 197, Exercise 4.39: delete "and some $\lambda \in (0,1)$"

p. 223, Exercise 5.5(c): "$\gamma \geq 0$" should be replaced with "$\gamma > 0$"

p. 316, first line: replace "network flow problem" with "uncapacitated network flow problem."

p. 347, Exercise 7.2, third line: replace "period" with "year"

p. 349, Exercise 7.11, before part (a): Insert "Assume that $d_i > 0$ for all i."

p. 354, Exercise 7.31(b): rewrite as follows: "Given a dual feasible basis associated with a certain tree, show that it is an optimal basis if and only if the corresponding tree solution to the primal is feasible."

p. 355, Exercise 7.35(c): replace "and therefore converges" with "and therefore converges after a finite number of steps"

p. 445, Exercise 9.12(b): "Show that the direction" should be replaced with "Suppose that the direction"

p. 445, last line: replace $\mathbf{d}_s^k$ with $\mathbf{d}_x^k$.

p. 455, replace next to last sentence with: "To this effect, we consider a binary variable y_i, $i = 1, \ldots, k-1$, which can be equal to 1 only if $a_i \leq x \leq a_{i+1}$, and must be 0 otherwise."

p. 525, Exercise 11.9: in the hint, replace "$f(\mathbf{x}) \leq t$" with "$f(\mathbf{x}) \geq t$".

p. 538, next to last displayed equation: replace $x_{fdo\tau}$ with $x_{fod\tau}$