Errata: Theory of Computation [1]

Dexter Kozen
Department of Computer Science
Cornell University
Ithaca, New York 14853-7501, USA
kozen@cs.cornell.edu

These are errata discovered in the first printing of the text [1]. I would be grateful to receive from readers any further errors, omissions, comments, or suggestions. All contributions will be acknowledged.

p. 12 In Theorem 2.3, only the premise regarding the time lower bound is needed; the space bound is not. The significance of the premise should be explained.

pp. 44ff. Email from Martin Orr:

> I have been studying your book 'Theory of Computation', and I believe I have found an error in Lecture 7, on alternation. I was unable to find errata for the book on the web.
>
> You consider the order $\bot \leq 0$, $\bot \leq 1$ on functions $C \to \{0, 1, \bot\}$ (written $\sqsubseteq$) and say "The set of labelings forms a complete lattice under $\sqsubseteq$." This is surely false, because the constant 0 and constant 1 labelings have no upper bound. This invalidates the use of the Knaster-Tarski theorem to construct a labeling ℓ^* of the configurations of an ATM.
>
> Presumably the correct statement would be that the set of labelings is a complete partial order, and use of a fixpoint theorem for CPOs. But Supplementary Lecture A, which contains a proof of the Knaster-Tarski theorem, does not discuss fixpoints for CPOs.

pp. 98, 106 Email from Dmitry Shkurko:

> It seems that there should be p instead of q in $z^{q-1} - 1$ at the page 98 (searching roots of resultant in GP_p). On the page 106 you also implicitly assume high density of prime numbers, i.e. something like $\pi(n)\ n/\ln n$, because $\pi(n) > \ln n$ is insufficient there.

pp. 107, 108 This argument implicitly uses the Schwartz–Zippel Lemma (Corollary 13.3, p. 79). The reference should be made explicit.

p. 116 $\{0,1\}^{n^c}$ should be $\{0,1\}^{c \log n}$ (2 places)

p. 158 Diagram: the first horizontal transition should be labeled $(1, -)$

p. 196 "... we can to show..." should be "... we can show..."

p. 202 second paragraph: need $a = \max 2k + 4, t + 1$ (needed for application of 31.3)

p. 258 In the last two lines, $\vee$ and $\wedge$ are switched

p. 290 Ex. 7: $o(\log n)$ should be $o(n)$

p. 295 Ex. 36: *NLOGSPACE* should be *DLOGSPACE*

p. 309 Ex. 101 and 102 are the same. Ex. 103 is the same as 97.

p. 319 Ex. 2: This is a solution to the wrong problem.

References

[1] Dexter Kozen. *Theory of Computation.* Springer, New York, 2006.