

S. Barry Cooper: ‘Computability Theory’ - Errata:

Additions to this list are very welcome – please email them to me at: s.b.cooperleeds.ac.uk

- p.6, lines b.10 and b.6. Should read: “ Ignorabimus ”
- p.13, line b.2. n should be m : “ $f(m, 0) = U_1^1(m)$ ”
- p.16, line 8. Should read: “ $\text{rm}(m, n + 1) = \text{rm}(m, n)' \times \text{sg}(|m - \text{rm}(m, n)'|)$ ”
- p.16. Exercise 2.1.11 needs to be taken after Definition 2.2.1.
- p.17, line 18. Should be “ $A(m, 4)$ ”
- p.17, line b.10. Should be “ $A(4, 4) = 2^{2^{65536}} - 3$ ”
- p.17, line b.9. Brackets need correcting : “ $2^{2^2} = 2^{(2^{(2^2)})}$ ”
- p.25. Subscript in Exercise 2.2.22: “ $u_0 = k_0$ ”
- p.27, line b.1. Should read: “ $\mathbf{0}$ is computed by ”
- p.33, line b.12. Should be: “ $h(m, n)$ ”
- line b.5. “ if for all ” instead of “ of for all ”
- p.45, line b.9. Should read: “ describable in such a theory ”
- p.47, line 12. Should read “ $x_1 \leq x_2$ ”.
- p.48, line b.9. Missing left bracket: “ $(x_1 = x_2 \implies (x'_1 = x'_2))$ ”
- p.51. In Exercise 3.1.10 should be “ $\bar{0}$ ”
- line b.6. Should read “ This is a proof ”
- p.54, line 6. Should read “ By exercise 3.1.18 ”
- p.57. In solution of Example 3.2.7 should be: “ the wf $(x_1 = \bar{0})$ ”, “ $\vdash_{\text{PA}} \bar{m}_1 = \bar{0}$ ”, “ $\vdash_{\text{PA}} \neg(\bar{m}_1 = \bar{0})$ ”
- p.59, lines 13–15. Instances of \bar{m} should read $\bar{m}i$; and of \bar{m} should read \bar{m}
- line b.12. φ should be f
- line b.10. φ should be PA
- In Hint of Exercise 3.2.14, instances of “ \bar{x} ” should read “ \vec{x} ”
- p.67. Missing argument in Definition 4.5.2: “ $\varphi_{e,s}(x)$ ”
- p.74. In Example 5.2.6 need “ $\varphi_e(x)$ ” to replace first two instances of “ $\varphi_{e,s}(x)$ ”
- p.77. In Exercise 5.2.16, “ ψ ” should be “ f ”
- p.78, line 7. e should be y
- p.79, line 8. “ $x \in K \iff x \in W_x \iff (\exists s)[x \in W_{x,s}]$ ”
- p.80, line 11. Should read “ $\forall x \in \mathbb{N}$ ”
- p.82, lines b.2,3. “ $4n(n^2 + 2n + 1)$ ” should be “ $4n(n^2 + n + 1)$ ”
- p.89, line 9. “ \subseteq ” instead of “ \subset ”
- p.90, line 7. Should read “ and enumerate $f(i_0)$ into A ”
- p.94, line 6. The hint needs a closing “] ”
- p.96, line 7. Missing “ } ” at end of line.
- p.106, line b.13. Should be: “ $A \equiv_m A$ ”
- p.109, line b.8. Should read “ $\mathbf{0}_m \supseteq \text{deg}_m(B)$ ”
- p.118, line 2. Should read: “ is a sequence of symbols ”
- p.121, Line 2. Should be “ $\vdash_{\text{PA}} \psi(\bar{m}, \bar{n}_0)$ ”
- Line 4. Missing quantifier: “ $\vdash_{\text{PA}} (\exists x_1)\psi(\bar{m}, x_1)$ ”
- p.124, Line 7. “ complete ”
- p.129, line 3. Should read: “ Let $\mathcal{T}' = \mathcal{T} \cup \Sigma$ ”
- p.133. Should be “ \leq_1 ” in exercise 9.3.3.
- p.141, line 13. $B \leq_T A$ should be $B \leq_m A$
- p.142, top of page. In the Turing program, a quadruple is missing: q_31Rq_4
- p.143, line b.7. Should be “ Φ_e ”
- p.146, line 13. Missing “ } ”
- p.147, line 5. Missing g : “ $f \leq_T g$ ”
- line b.11. Should read: “ that for \mathcal{D}_m ”
- p.149. Exercise 10.4.11 depends on Definition 10.4.13 on p.150
- p.151, line 8. Should be: “ $B \leq_T A$ ”
- p.156, line 1. Need “ $\emptyset^{(0)}$ ” instead of $\emptyset^{(n)}$.
- line 13. Should be: “ (\Leftarrow) ”
- line b.3. Should read: “ every $X \in \Sigma_n^0$ ”
- p.157. Delete lines 16–18 (repeated from p.155)
- p.159. In exercise 10.5.11, should be “ $n > 0$ ”
- p.164, line 14. Should be: “ $k \neq \sigma_{e+1}(x_e)$ ”
- line b.5. Should read “ in place of $\sigma, \tau, 2i$ ”
- p.165. Insert closing “ } ” in equation 10.2.

- p.168, line b.4. Missing |: “ $C(i) = \sigma_{2i+2}(|\sigma_{2i+1}|)$ ”
- p.169, line 2. Missing closing “) ”
line b.6. Since i is given, should read: “ for all $x \geq 0$ ”
- p.176, line b.10. Omit index i on the first Ψ .
- p.182, line 13. Redundant closing bracket: “ $= (\lambda x.(\lambda y.y)((\lambda y.y)x))x$ ”
- p.184, line 11. Misplaced . : “ $((\lambda x.E_1)E_2)$ ”
- p.201, line b.6. Misplaced + : “ $\langle x, z \rangle \in \Psi_i^+$ ”
- p.203, line b.5. Incorrect font: “ $A \subseteq \mathbb{N}$ ”
- p.205, line 2. The \mathfrak{M} 's should be boldface
- p.208, line b.12. Redundant . : “ selected cases: ”
- p.214, line b.3. Remove plural: “ polynomial version ”
- p.220, line b.6. “ (2) A degree \mathbf{a} is n -c.e. if it contains an n -c.e. set. ”
- p.221, line 7. Replace the = with \geq
- p.226, line 12. Should be: “ $W_e \not\subseteq A$ ”
- p.227, line b.7. Should read: “ is an immune set of degree \mathbf{a} . ”
- p.228. First line should end “ So $A \equiv_T D$. ”
- p.229, line 4. $\overline{A} \cap X$ should be $A \cap \overline{X}$.
line 10. In Exercise 12.2.12, second “ r-cohesive ” should read “ cohesive ”.
line b.9. Misplaced A : “ Say $f(n) \geq A(n)$ ”
- p.251, line 8. Should start: “ Then $A \equiv_T B \oplus C$ ”
- p.267, last line. Should start: “ $i \geq \ell_{s^*}$ ”
- p.285, line 8. Missing closing bracket: “ $N_\sigma \subseteq \Phi(N_\tau)$ ”
In Exercise 13.2.25 add: “ with respect to the Sierpinski topology, whose basic open sets are of the form $N_D = \{X \mid D \subseteq X\}$, D finite. ”
- p.294, line b.2. Both instances of \subset should be \supseteq
- p.296, lines 13–14. The statement that the proof of Theorem 13.3.20 certainly seems to need 2-genericity, and there is a 1-generic which bounds no minimal pair, is incorrect. It is easy to check that if $A = A_0 \oplus A_1$ and A is 1-generic, then $\deg(A_0)$ and $\deg(A_1)$ form a minimal pair. (The situation in the e-degrees would be as stated.)
- p.297, line 11. Omit “ $\vee \sigma(x) = \uparrow$ ”.
- p.301, line 7. Both instances of \mathcal{D}_r should be \mathcal{C}
- p.302, line b.3. Missing subscript: “ Choose $\alpha_{n+1} = \alpha_n \widehat{i}$ ”
- p.304, line 16. r missing in subscript: “ $T_{r|\Phi+1}$ ”
- p.305, line b.2. Line should begin “ $\mathbf{a} > \mathbf{0}$ ”
- p.307, line 8. Change the g to f
- p.311. Last line should end “ $\mathbf{b} \in X$. ”
- p.312, line 13. “ player’s turn ”
- p.314, line b.4. Undo the shifted superscript: “ Π_n^1 ”
- p.315, line 10. Missing) : “ $= \Phi_{j,s}(\Phi_{i,s}^A)$ ”
- p.317, line b7. Redundant “ \mathbf{a} ”: “ of such minimal upper bounds. ”
- p.318, line 10. Replace the “ \mathbf{a} ” by a “ \mathbf{y} ”
- p.325, line b.9. Missing] : “ $(\forall i)[f(i) \neq \varphi_i(i)]$ ”
- p.338, line 11. Should read: “ Hence $g \in \mathcal{P}_i$ ”
- p.339, line b.2. Should begin: “ $|D_{f(n)}| =$ ”
- p.359, line b.3. “ $\text{Ord}_T(\sigma)$ ”
- p.360, line b.3. Should read: “ The set of all notations for constructive ordinals ”
- p.361, line 8. Clause (3) should be numbered “ (2) ”
- p.373, line 4. The $<$ should be a \leq
- p.374, line 4. Insert missing j : “ for $i, j \geq M'(n)$ ”
- p.376, line 3. Should begin: “ Then $r = \sum_{i \geq 0} 2^{-n_i}$. ”
- p.377, line 6. Should read: “ We say a c.e. ”
- p.378, line b.2. “ $[0, 1]$ ”

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Barry Cooper, May 5, 2008