Errata for the book "Parameterized Algorithms" by Marek Cygan, Fedor V. Fomin, Łukasz Kowalik, Daniel Lokshtanov, Dániel Marx, Marcin Pilipczuk, Michał Pilipczuk, and Saket Saurabh

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- p. viii, line -2: "certain problem" should be "certain problems"
- p. 22, line 9 (i.e., line 2 of Reduction VC.3): "If $k < 0$ and G has more than..." should be "If $k < 0$ **or** G has more than..."
- p. 24, line -3: $k'^2 + k'$ should be $k'^2 + 2k'$
- p. 39, statement of Theorem 2.26: the proof shows only the bound of $d! \cdot k^d \cdot d$ on the number of sets
- p. 42, last line of Exercise 2.29: "function d" should be "function f"
- p. 53–55, Section 3.1: all summands $n\sqrt{m}$ in the running time bounds should be $m\sqrt{n}$.
- p. 76, Bibliographic notes: The discussion on "LP-guided branching" (fourth paragraph) should mention the work of Guillemot (Sylvain Guillemot, *FPT algorithms for path-transversal and cycle-transversal problems.* Discrete Optimization 8(1): 61-71 (2011)) where the first LP-guided branching algorithms were presented.
- p. 84, line 23: the definition $q = k + 1$ is missing here
- p. 84–85: in the literature, the "natural position" of v is often denoted $p(v)$, not $p[v]$ as in our book
- p. 92, line 24: "find a set S" should be "find a set X" and "$G - S$" should be "$G - X$"
- p. 96, hint to Exercise 4.5: in the last bullet, some people find it more intuitive to reduce to the problem of finding a matching of maximum weight in a weighted bipartite graph (instead of maximum matching of minimum cost)
- p. 97: hints to 4.9 and 4.8 are in the wrong order
- p. 104 line -2 to p. 105, line 2: we should additionally add to the definition of $\mathrm{PATH}(S, u)$ that $\mathrm{PATH}(S, u) = \mathrm{False}$ whenever $\chi(u) \notin S$, that is, $u \notin \bigcup_{i \in S} V_i$
- p. 110, line -3: $k/2^i$ should be $\ell/2^i$
- p. 135, line 10: "inequalities are satisfiable" should be "inequalities are satisfied"
- p. 136, line -4 and -3: "$L_\pi(v)$ is the set of vertices preceding v, and $R_\pi(v)$ is the set of vertices succeeding v" should be "$L_\pi(v)$ is the set of neighbors of v preceding v, and $R_\pi(v)$ is the set of neighbors of v succeeding v"

- p. 143, line -9: "depends only $\mathcal{G}_k$" should be "depends only on $\mathcal{G}_k$"
- p. 149, hint for 6.19: "yes-instance" should be "no-instance"
- p. 149, line -5: [367] should appear only once in the long list of references
- p. 150, last line of the third paragraph: the second author of the book [366] is Thomassen, not Thomas
- p. 150, line -3: the reference to Sachs is missing: *On spatial representation of finite graphs, in Finite and Infinite Sets*, Vol. I, II (Eger, 1981), 649–662, Colloquial Mathematica Societati Janos Bolyai, Vol. 37, North-Holland, Amsterdam, 1981
- p. 156, line 15: "Similarly, for $j = 1$, we should" should be "Similarly as for j=1, we should"
- p. 156, formula (7.2): X_i should be X_j under the max operator
- p. 159, statement of Lemma 7.2: with some care, one can obtain $\mathcal{O}(p \cdot \max(r, |V(G)|))$ running time bound, but the one stated (with p^2) is easier to argue
- p. 160, line -13: the treewidth of $K_{m,n}$ is $\min\{m, n\}$, not $\min\{m, n\} - 1$
- p. 184, line -13: "by bounded by" should be "be bounded by"
- p. 189, line 21: "A bramble is the" should be "A bramble is a"
- p. 191, Theorem 7.17: the work of Bodlaender claims a running time bound $2^{\mathcal{O}(k^3)} \cdot n$, which can be obtained by a careful analysis of the arguments there; the bound stated in the book is the one easier to obtain from the arguments of Bodlaender
- p. 194, line -3: $p < q$ should be $q < p$
- p. 200, line 20: "scope this book" should be "scope of this book"
- p. 205, line -2: "closed under taking of minors" should be "closed under taking minors"
- p. 212, third bullet starting at line 9: the set S we are looking for is a vertex set. Also, "If we take $j = k+1$, then" may be removed, while Corollary 7.34 is applied for $j = k+1$.
- p. 213, line 7: "The proof of the following statement" should be "The following statement"
- p. 220, Fig. 7.8 caption line 2: "that are originate" should be "that originate"
- p. 222, line -6: "got contracted onto w" should be "got contracted onto $\eta(w)$".
- p. 222, line -5: $G'[J_w]$ should be $G_H[J_w]$
- p. 223, line 2–3: "with its subgraph in $\widehat{H}$" should be " with the subgraph in $\widehat{H}$ isomorphic to H"
- p. 223, line 6: "for $(p + 4)(k + 2)$" should be "for $f(k) = (p + 4)(k + 2)$"
- p. 225, line -7: $G'[Y_i]$ should be $G_H[Y_i]$

- p. 231, line 1: the inequality should read $\mathrm{rw}(G) \leq \mathrm{tw}(G) + 1$
- p. 231, line 7: "Designing dynamic-programming routines" should be "Dynamic-programming routines"
- p. 240: the hints for 7.50 and 7.48 should be swapped
- p. 256, Theorem 8.11: "in graph G" should be "in a graph G"
- p. 256, line -11: $2k - \lambda < 0$ should be $2k - \lambda < k$
- p. 258, Theorem 8.14: "superset $\mathcal{S}'_k$ of every important (X, Y)-cut" should be "superset $\mathcal{S}'_k$ of the set of all important (X, Y)-cuts"
- p. 260, line -9: "Let F contain an edge e if it is incident" should be "Let F be the set containing an edge e if and only if it is incident"
- p. 260, line -3: "As $R \cap Y = \emptyset$" may be expanded to "As $R \cap Y = \emptyset$ and e is incident to Y"
- p. 265, line -3: "are adjacent" should be "is adjacent"
- p. 266, line -7: increases by $|V_i|$, not $|C|$
- p. 267: the recurrence in the middle of the page works for $j \geq |V_i|$; for $j < |V_i|$ it is just $T[i, j] = T[i - 1, j]$
- p. 274, proof of Lemma 8.40, line 5: "(X, Y)-cut" should be "(s_ℓ, T)-cut"
- p. 276, line -2: $G' \setminus S$ should be $G' \setminus S'$
- p. 277, line -12: "directed $t_i \to s_i$ path" should be "directed $s_i \to t_i$ path"
- p. 280, problem 8.2: the quantification for v should be $v \in V(G) \setminus B$, not $v \in V(G)$
- p. 282, hint to 8.2, line 2: "necessary" should be "sufficient"
- p. 283, hint to 8.14: the new edges should be made undeletable, e.g., by introducing each of them in $k + 1$ copies
- p. 283, hint to 8.18, line 2: "no vertex of v" should be "no vertex of F"
- p. 297, proof of Lemma 9.7, line 2: "incident to z" should be "incident to v"
- p. 297, line 3 after proof of Lemma 9.7: "a vertex of C" should be "a vertex of A"
- p. 317, exercise 9.5: CVC.4 should be CVC.6
- p. 318, hint to 9.10: it suffices to get an $\mathcal{O}(r + k)$ bound on the number of vertices within distance exactly d from S
- p. 334, line -3: $(b + c)va =$ should be $(b + c) \cdot a$
- p. 335, line 13: "and then they correspond" should be "and correspond"

- p. 343, Theorem 10.23, line 2: "family of sets" should be "family of subsets"
- p. 345, proof of Lemma 10.24: for the bound $\mathcal{O}(km)$ on the number of field operations, one needs to additionally precompute $\sum_{\ell \in X} y_{v,\ell}$ for every $v \in V(G)$
- p. 347, Case 1, line -2: "exactly in the same so" should be "exactly the same so"
- p. 351, second paragraph, line 4: it would be more clear if the main formula of the line reads $v_i, v_{i+1}, \ldots, v_j = v_j, v_{j-1}, \ldots, v_i$
- p. 352, Problem 10.5: of course, we want to show that it is impossible *in FPT time* to count solutions for Steiner Tree
- p. 367, line -1 of the grey box: last subclause should read "if they give a connected subgraph when joined"
- p. 367, line -10: "carnality" should be "cardinality"
- p. 370, Theorem 11.11: the factor $2^{\mathcal{O}(|U|)}$ in the running time can be replaced with $|U|^{\mathcal{O}(1)}$ as if $|\mathcal{A}| \leq 2^{|U|-1}$, then we can output $\mathcal{A}$ directly without any work
- p. 374, hint to 11.10: Steiner Tree should be Longest Path
- p. 375, line -1: ω here is the matrix multiplication exponent
- p. 377, lines 16–17: "then we can use" should be "then using"
- p. 379, section 12.1.1: the first paragraph uses too much jargon; vectors v_e should be chosen from a vector space over some field $\mathbb{F}$ and they should be taken from the same vector space for every $e \in U$
- p. 380, line 5 of Section 12.1.2: α_e^{k-1} should be α_i^{k-1}
- p. 383, line -10: "disjoint sums" should be "direct sums"
- p. 401, line -17: $\binom{(ek)^d}{d}$ should be $\binom{(ek)^d}{k}$
- p. 408, equation (12.3): the equation should read

$$|\widetilde{\mathcal{P}}_{uv}^{p,q}| \leq n \cdot \max_{w \in V(G)} |\widehat{\mathcal{P}}_{uw}^{p-1,q+1}|$$

- p. 409, line -11: "a feel of Theorem 12.15" should be "a feel of Theorem 12.31"
- p. 426, line -1: "an equivalent instance of C" should be "an equivalent instance (x'', k'') of C"
- p. 430, caption of Figure 13.1: "connectes" should be "connects"
- p. 433, point (iii) on the second list: $e \in X$ should be $e \in U$
- p. 436, line 2 after the grey box: "the value of the output gate is 1 in an assignment to the input gates" should be "the value of the output gate is 1 given a fixed a ssignment to the input gates"

- p. 447, item (ii): $1 \leq j \leq i$ should be $1 \leq j \leq n$
- p. 450, line -14: "we many omit" should be "we may omit"
- p. 458, line 4: $e_{i,j}$ should be $w_{e_{i,j}}$ in the definition of the set S
- p. 463, hint to 13.28, line 2: the vertices of G, not B
- p. 464, third paragraph, line 1: [149] should appear once in the reference list
- p. 469, line 5: "the q-SAT is" should be "the q-SAT problem is"
- p. 469, line 21: "infinimum" should be "infimum"
- p. 471, line 13: "providing" should be "provided"
- p. 499, line -8: "at distance at least 1" should be "at distance at least 2"
- p. 516, exercise 14.9: the notation $2^{o(k \log \ell)}$ is a bit informal; we ask here for an $2^{\Omega(k \log k)}$ lower bound in instances where ℓ is a nonconstant polynomial of k
- p. 537, line 11: "be an index" should be "be the index"
- p. 554, hint for 15.4, point 14, line 2: "four colors" should be "three colors"
- p. 579, line 1: "A G graph" should be "A graph G"
- p. 579, third paragraph, lines 2-3: "on $V(T)$" should be moved to the end of the sentence
- p. 590, definition of Independent Set: X should be of size at least k, not at most k.
- p. 594: Planar Vertex Deletion should be later in the alphabetical order