ERRATA

for

Algebraic Combinatorics, second ed., Springer, 2018

(19 July 2024)

I am grateful to Benjamin Sambale and Feihu Liu for most of these corrections.

• page 6, line 10. Change $p(p-1)^\ell$ to $p(p-1)^{\ell-1}$.

• page 9, Exercise 13. While this exercise is correct, it is not so interesting because no such graphs exist! It is a nice exercise to find a proof. See MathOverflow 431083.

• page 16, line 1–. Change this line to

$$=rac{1}{2^n} \left[ \sum_{i=0}^{n-1} \binom{n-1}{i} \frac{(n-2i)^{\ell+1}}{n-i} - (-n)^{\ell} \right].$$

The expression after the = sign can be written in the simpler form

$$\frac{1}{n2^n} \sum_{i=0}^{n} \binom{n}{i} (n-2i)^{\ell+1}.$$

• page 19, line 3. Change $u, v$ to $u+v$.

• page 30, line 2. The right-hand side is missing a factor $1+x$. It should be

$$(1+x) \left((I_{p-1} - (x+1)M[v])^{-1}T[v]\right)_u.$$

• page 36, Lemma 4.6. It should be noted that we set $U_{-1} = 0$ and $D_{n+1} = 0$.

• page 49, line 17–. It should be assumed that $m \geq 3$ in the statement that $G$ is isomorphic to $S_m$. 
• page 70, proof of Theorem 6.14. It was not shown before that $M(n)$ is rank-symmetric, though this is immediate from the last line on page 68.

• page 83, Theorem 7.7, line 2. We should take $X$ to have $t$ elements, not $n$, since $n$ is used for the number of colors. In the proof on page 84 it is correctly assumed that $\#X = t$.

• page 94, line 3-. Change $\sum_{i=0}^{i(i-1)} h_i(4)q^i$ to $\sum_{j=0}^{i(i-1)} h_j(4)q^j$.

• page 95, line 5. Change $r$ to “at most $r - 1$”.

• page 95, line 8. Change “at most $r$” to “at most $r - 1$”.

• page 105, lines 15– to 14–. The letter $n$ is used in two different ways. We should let $\lambda \vdash m$, for instance.

• page 139, line 1–. Change the $(1, 1)$ entry of $L(G)$ from 4 to 5.

• page 150, line 3–. Change $kn^{n-k-1}$ to $kp^{p-k-1}$.

• page 151, line 8–. Change $e_2$ to $v_2$.

• page 151, line 6–. Change $e_j$ of $e_i$.

• page 151, line 5– (third bullet). This line is superfluous.

• page 161, Exercise 5. In parts (d) and (e), we should assume that $G$ is connected.

• page 173, line 18. Change $V_q = 1$ to $V_q = -1$.

• page 174, line 11–. Change $V_q = 1$ to $V_q = -1$.

• page 187, line 6–. We neglected to define (though hopefully the definition is obvious) the dimension of $\Delta$ to be the maximum dimension of a face of $\Delta$.

• page 193, line 14–. Change $1 \leq k \leq n$ to $1 \leq k \leq j$.

• page 194, line 10. Change “the set of” to “the set $Y$ of”.

• page 194, line 12. Change “$X =$” to “$Y =$”.
• page 194, line 1–. Change 13 to 12.
• page 196, line 2. Change 312 to 321.
• page 196, line 11. Insert “ce,” after “cd,“.
• page 198, Example 12.14(a). The $f$-vector should be $(4, 3)$, not $(3, 2)$. Hence line 3 becomes

$$(x - 1)^2 + 4(x - 1) + 3 = x^2 + 2x,$$

and the $h$-vector is $(1, 2, 0)$.
• page 204, line 7. Earlier there should have been defined the Hilbert function of $K[\Delta]$ by

$$H(K[\Delta], i) = \dim_K K[\Delta]_i.$$
• page 204, Theorem 12.20, line 3. Insert “if” after “only”.
• page 204, lines 9– and 7–. Change $j - 1$ to $j$.
• page 205, line 1. Change $k$ to $j$ (three times).
• page 210, line 18–. Change $d$ to $h_i$ (twice). Also, the notation $\beta_1, \ldots, \beta_{h_i}$ for both the concatenation of the sequences $b_j$ and the list of these sequences is confusing. It would be better to either delete the first $\beta_1, \beta_2, \ldots, \beta_{h_i}$ or to introduce new notation for concatenation, such as $\text{concat}(\beta_1, \ldots, \beta_{h_i})$.
• page 213, Exercise 2, line 3. Change $F_{i_{1}}$ to $F_{i-1}$.
• page 239, line 7–. Change a. to (a).
• page 239, Exercise 6(a). It should be stated that a club is allowed to be empty (no members).
• page 239, line 3–. Change b. to (b).