

## Errata

We thank Pieter Allaart, University of North Texas, and Ayush Bharadway to hint at the following points.

1. p. 11. In Lemma 1.27 we used a different notation in the lemma than in the proof. This has led to confusions. Lemma and proof are corrected as follows:

### Lemma 1.27 ( $\sigma$ -Algebra generated by the trace of a set system)

Let  $A \subset \Omega$  be nonempty,  $\mathcal{E} \subset \mathcal{P}(\Omega)$ , and  $\mathcal{E}|_A := \{C \cap A : C \in \mathcal{E}\}$ . Then

$$\sigma_A(\mathcal{E}|_A) = \sigma_\Omega(\mathcal{E})|_A. \quad (1)$$

Furthermore, if  $\mathcal{C}$  is a  $\sigma$ -algebra on  $\Omega$  and  $A \in \mathcal{C}$  such that

$$\forall C \in \mathcal{C}: C \neq A \Rightarrow A \cap C = \emptyset, \quad (2)$$

(i. e.,  $A$  does not intersect with any other element of  $\mathcal{C}$ ), then

$$\sigma_\Omega(\mathcal{C} \cup \mathcal{E})|_A = \mathcal{C}|_A. \quad (3)$$

Proof of Lemma 1.27:

We use  $\sigma_\Omega(\mathcal{E})$  to denote the  $\sigma$ -algebra on  $\Omega$  generated by  $\mathcal{E} \subset \mathcal{P}(\Omega)$ . Similarly,  $\sigma_A(\mathcal{D})$  denotes the  $\sigma$ -algebra on  $A$  generated by  $\mathcal{D} \subset \mathcal{P}(A)$ .

(1.15).  $\sigma_\Omega(\mathcal{E})$  is a  $\sigma$ -algebra on  $\Omega$  and  $\mathcal{E} \subset \sigma_\Omega(\mathcal{E})$ , by definition of  $\sigma_\Omega(\mathcal{E})$ . Hence,  $\mathcal{E}|_A \subset \sigma_\Omega(\mathcal{E})|_A$ , and  $\sigma_\Omega(\mathcal{E})|_A$  is a  $\sigma$ -algebra on  $A$  (see Exercise 1-5). Therefore, the definition (1.10) yields

$$\sigma_A(\mathcal{E}|_A) \subset \sigma_\Omega(\mathcal{E})|_A.$$

Furthermore,  $\mathcal{E} \subset \sigma_\Omega(\mathcal{E}|_A \cup \mathcal{E}|_{A^c})$ , which implies

$$\sigma_\Omega(\mathcal{E}) \subset \sigma_\Omega(\mathcal{E}|_A \cup \mathcal{E}|_{A^c}) \quad [\text{Rem. 1.23}]$$

$$\subset \sigma_\Omega(\sigma_A(\mathcal{E}|_A) \cup \sigma_{A^c}(\mathcal{E}|_{A^c})) \quad [\text{Rem. 1.23}]$$

$$= \{C \cup D : C \in \sigma_A(\mathcal{E}|_A), D \in \sigma_{A^c}(\mathcal{E}|_{A^c})\}. \quad [\text{this set system is a } \sigma\text{-algebra}]$$

Therefore,

$$\begin{aligned} \sigma_\Omega(\mathcal{E})|_A &\subset \{C \cup D : C \in \sigma_A(\mathcal{E}|_A), D \in \sigma_{A^c}(\mathcal{E}|_{A^c})\}|_A \\ &= \{(C \cup D) \cap A : C \in \sigma_A(\mathcal{E}|_A), D \in \sigma_{A^c}(\mathcal{E}|_{A^c})\} \\ &= \{C \cap A : C \in \sigma_A(\mathcal{E}|_A)\} \quad [D \subset A^c] \\ &= \sigma_A(\mathcal{E}|_A). \quad [C \subset A] \end{aligned}$$

Hence, we have shown  $\sigma_A(\mathcal{E}|_A) \subset \sigma_\Omega(\mathcal{E})|_A$  and  $\sigma_\Omega(\mathcal{E})|_A \subset \sigma_A(\mathcal{E}|_A)$ , which is equivalent to  $\sigma_A(\mathcal{E}|_A) = \sigma_\Omega(\mathcal{E})|_A$ .

(1.17).

$$\begin{aligned}
 \sigma_{\Omega}(\mathcal{C} \cup \mathcal{E})|_A &= \sigma_A(\mathcal{C} \cup \mathcal{E}|_A) && [(1.15)] \\
 &= \sigma_A(\mathcal{C}|_A \cup \mathcal{E}|_A) && [\text{see def. of the trace in Example 1.10}] \\
 &= \sigma_A(\mathcal{C}|_A \cup \{\emptyset, A\}) && [(1.16)] \\
 &= \sigma_A(\mathcal{C}|_A) && [\{\emptyset, A\} \subset \mathcal{C}|_A] \\
 &= \mathcal{C}|_A. && [\text{Exercise 1-5, (1.12)}]
 \end{aligned}$$

2. p. 65. Remark 2.67, points a), b), and c): replace  $f(\omega)$  by  $f(\omega)$
3. p. 235. Remark 7.26, Equation (7.25):  $\text{Var}[\alpha_0 + \alpha_1 \text{Var}(X)] / \text{Var}(Y)$  should be replaced by  $\text{Var}(\alpha_0 + \alpha_1 X) / \text{Var}(Y)$
4. p. 263. The header of Definition 8.29 should be **Continuous uniform distribution on a set with a finite measure**.
5. Everywhere in the book the word “dice” should be replaced by “die” and “dices” should be replaced by “dice”.
6. p. 254, line 2 of section 8.1.1:  $p_X(x)$  should be replaced by  $p_X(x_i)$ .
7. p. 345, Remark 11.7, line number 5: “Definition (11.11)” should be replaced by “Equation (11.11)”.
8. p. 396, Equation (3.12):  $\beta_1$  should be replaced by  $\lambda_1$ .
9. p. 398, Equation (3.19): The two terms on the right hand side should be switched to
 
$$P(Y=1|Z=z_i) - P(Y=1|Z=z_0).$$
10. p. 399, Remark 13.19, line number 3: “They quantify the effect of  $x_i$  compared to  $x_0$  on  $Y$ ” should be replaced by “They quantify the effect of  $z_i$  compared to  $z_0$  on  $Y$ ”.
11. p. 423: The subscripts of  $V_1$  and  $V^*_1$  are improperly italicized (twice on line 9, once on line 11, and once on line 17).
12. p. 452, title of Remark 15.6: “ $P$ -uniqueness” is mistyped.
13. p. 459, Equation (15.28):  $g_0(Ann) = .2$  not  $.4$ .
14. p. 459, Equation (15.31): Both values should be preceded by a “minus” sign.
15. p. 459, Equation (15.31):  $g_0(Ann) = .2$  not  $.4$ .
16. p. 459, last displayed equation: The final outcome of the calculation should be .05, not .5. (See also first line of p. 460.)
17. p. 479, Example 16.21, line 3. The probability of drawing Joe is not .5. Instead it is .4 and for Ann it is .6.
18. p. 527, Corollary 17.62: Replace “If  $Z$  is discrete, then ...” by “If  $Z$  is discrete with finitely many possible values  $z_1, \dots, z_n$ , then ...”.