Unofficial errata for Rick Durrett's *Probability: Theory and Examples, 4th edition*

Nate Eldredge and Math 6710 students

August 22, 2012

Page 23, Exercise 1.4.3 (ii): The reference to Exercise A.2.1 appears to be erroneous. Perhaps Lemma A.2.1 was meant.

Page 44, middle: "Remark: The reader should note that it is not easy to show $A \cap B \in \mathcal{L}$, or $A \cup B \in \mathcal{L}$": The reason it is not easy to show these things is because they are in general false, since a λ-system is not necessarily a σ-field. My favorite example: let $\Omega = \{HH, HT, TH, TT\}$ represent two coin flips, with all outcomes having probability 1/4. In the notation of Theorem 2.1.2, take $n = 2$, $A_2 = \{HH, TT\} = F$. Then $L = \{\Omega, \emptyset, \{HH, HT\}, \{TH, TT\}, \{HH, TH\}, \{HT, TT\}\}$ which is not closed under intersections or arbitrary unions.

Page 58, bottom: the displayed equation should be marked (*)

Page 61, bottom, Remark: "the assumption in is" should presumably be "the assumption in Theorem 2.2.7 is"

Page 64, Exercise 2.2.8: The reference to (5.5) should apparently be to Theorem 2.2.6.

Page 102, top, proof of Theorem 3.2.4: $f(g(Y_\infty)$ is missing) and should be $f(g(Y_\infty))$ (two places)

Page 102, middle: Theorem 3.2.5 (iv) should read "For all *Borel* sets A"

Page 104, second line from bottom: "distriubtion" should be "distribution"

Page 107, top line: "charactersitic" should be "characteristic"

Page 116, Theorem 3.3.8: I think Lemma 3.3.7 is not really necessary for Theorem 3.3.8; we can also get it directly from Exercise 3.3.14 and Taylor's theorem (really, just the definition of the second derivative). This is all we need for the basic CLT of Theorem 3.4.1.

Page 271, Theorem 5.7.6: A simpler proof: $X_{N\wedge n}$ is a supermartingale so $EX_0 \geq EX_{N\wedge n}$. But $X_{N\wedge n} \to X_N$ a.s. so by Fatou $EX_N \leq \liminf EX_{N\wedge n} \leq EX_0$.

Page 271–272: In Theorem 5.7.7, φ and ϕ are the same.

Page 273, Exercise 5.7.6: $P(S_T leq a)$ should be $P(S_t \leq a)$. Also, showing that $E[X_T] = 1$ may be difficult (I'm not entirely sure that it's true); however, showing $EX_T \leq 1$ is sufficient to get the conclusion $P(S_T \leq a) \leq \exp(-\theta_0 a)$.

Page 273, Exercise 5.7.7: $EX_i > 0$ should be $E\xi_i > 0$. I presume we are meant to take $T = \inf\{n : S_n \notin (a, b)\}$ as before, but if so then the conclusion is nonsense: for really large a we would have a probability greater than 1.

Page 356, following Theorem 8.1.1: (7.1) should be Theorem A.3.1.

Page 401, Theorem A.1.1: "a measure on $\bar{\mathcal{S}}$ the algebra" is missing a comma and should be "a measure on $\bar{\mathcal{S}}$, the algebra".