Linear Algebra and Probability
For Computer Science Applications
Errata

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1. p. 5. Before the second for loop add

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   >> a = 1;
   >> b = 1;
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2. p. 60 In the system of equations, in the first equation "$t_1(3)$" should be "$t_1(-3)$". In the second equation "$t_1(1)$" should be "$t_1(-1)$".

3. p. 82 Definition 4.2. The final capital S should be script $\mathcal{S}$.

4. p. 83, second bullet point. The two occurrences of $\vec{v}$ should both be $\vec{u}$.

5. p. 89, line before Theorem 4.23: $\vec{c}$ should be $\vec{v}$.

6. p. 118 Algorithm 5.1 "**for** (q **downto** p+1)" should be i "**for** (j=q **downto** p+1)".

7. p. 128 line −4. "L is the matrix corresponding to the product of the operations used in reducing M to U." This should be "L is the matrix corresponding to the product of the inverses of the operations used in reducing M to U."

8. p. 133 In the inset formula on the second line, $+t^3$ should be $-t^3$

9. p. 141 line −12 (including the formulas): "then **s** is only the line from **p** to **q** only if ..." should be "then **s** is only the line from **p** to **q** if and only if ..."

10. p. 150 line −4. The inequalities should be $-x + y - 3z > -2$ and $-x + y - 3z < -2$ (that is, the right hand side of both inequalities is -2 rather than 2.

11. p. 158 In the last inset formula, third term, the last multiplicand should be $\vec{v}$ rather than $\vec{u}$. That is, this term should be $\vec{u}^T R^T R \vec{v}$.

12. p. 162 2nd bullet point, the inset matrix should be

$$\begin{bmatrix} 0.5 & -0.866 \\ 0.866 & -0.5 \end{bmatrix}$$

The next line should read: Thus $\Gamma_2(\Gamma1(\mathbf{c}))) = \langle 0, 0 \rangle$; $\Gamma_2(\Gamma1(\mathbf{c}))) = \langle -1.0, 1.732 \rangle$;

3rd bullet point second line should read $\Gamma_3(\Gamma_2(\Gamma_1(\mathbf{d}))) = \langle 0, 2.732 \rangle$.

13. p. 164, last two formulas at the bottom of the page should read

$$\Gamma_1 = \begin{bmatrix} 1 & 0 & -1 \\ 0 & 1 & -1 \\ 0 & 0 & 1 \end{bmatrix} \qquad \Gamma_2 = \begin{bmatrix} -0.5 & -0.866 & 0 \\ 0.866 & -0.5 & 0 \\ 0 & 0 & 1 \end{bmatrix} \qquad \Gamma_3 = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$$

so

$$\Gamma = \Gamma_3 \cdot \Gamma_2 \cdot \Gamma_1 = \begin{bmatrix} -0.5 & -0.866 & 2.3660 \\ 0.866 & -0.5 & 0.6340 \\ 0 & 0 & 1 \end{bmatrix} \text{ and } \Gamma \cdot \mathbf{d} = \begin{bmatrix} 0 \\ 2.7321 \\ 1 \end{bmatrix}$$

14. p. 220 5th line from the bottom $\vec{b}_1$ should be $\vec{b}_n$.

15. p. 225, 2nd line from the bottom: "at least two heads" should be "exactly two heads."

16. p. 226, 7 lines from bottom (not including the inset formula): "total number of combinations" should be "total number of permutations".

17. p. 227 5 lines from the end of section 8.3.4, "the expansion of $(x + y)^{k}$" should be "the expansion of $(x + y)^{n}$".

18. p. 228, inset formula, second line, second factor in the product, first term in the denominator should be $k_2!$. That is, this line should read

$$= \frac{n!}{k_1! \cdot (n - k_1)!} \cdot \frac{(n - k_1)!}{k_2! \cdot (n - k_1 - k_2)!} \cdot \frac{(n - k_1 - k_2)!}{k_3! \cdot (n - k_1 - k_2 - k_3)!} \cdot \ldots$$

19. p. 230 line 1: "Section 8.3" should be "Section 8.2".

20. p. 231 Definition 8.8 first bullet: "$E_i \cap E_j$ are mutually exclusive" should be "E_i and E_j are mutually exclusive."

21. p. 232, final formula in section 8.5: Union should be intersection throughout. Also "$E2$" and "$E3$" in the middle of the formula should be "E_2". and "E_3" respectively. That is, the formulat should read:

$$P(E_1 \cap E_2 \cap \ldots \cap E_k) = P(E_1|E_2 \cap \ldots \cap E_k) \cdot P(E_2|E_3 \cap \ldots \cap E_k) \cdot \ldots \cdot P(E_{k-1}|E_k) \cdot P(E_k).$$

22. p. 235 end of bottom line: "$\neg(E_1 \wedge E_j)$" should be "$\neg(E_i \wedge E_j)$".

23. p. 241 equation 8.10: OR(X]F) should be OR(X|F).

24. pp. 254-256. Assignment 8.3 contains an error; fixing it elegantly requires a significant rewriting. An improved version can be found at
http://www.cs.nyu.edu/faculty/davise/MathTechniques/Prog8-3.pdf

25. p. 259 Section 9.1 fourth sentence: "If we sum up each row, we get a row vector of length n; this is the overall probability distribution of Y" should read "If we sum up each column, we get a row vector of length n; this is the overall probability distribution of Y".

26. p. 263, last para before section 9.3.1, 2nd and 3rd line: "...a 0.25 probability of a net utility of $4 + (-20) = 16$; the expected net utility is therefore $0.75 \cdot -1 + 0.25 \cdot -16 = -4.75$." should be "...a 0.25 probability of a net utility of $(-5) + (-20) = -25$; the expected net utility is therefore $0.75 \cdot -1 + 0.25 \cdot -25 = -5.5$."

27. p. 266 third inset formula:

$$\mathrm{Outcome}(A) = [20 \ldots$$

should be

$$\mathrm{Outcome}(A) = [30 \ldots$$
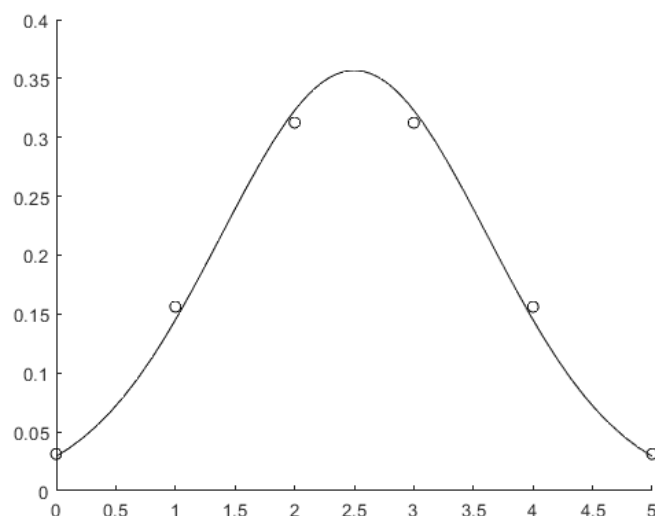
28. p. 266 fourth inset formula:

$$P(\mathrm{Outcome}(A){=}20) \ldots$$

should be

$$P(\mathrm{Outcome}(A){=}30) \ldots$$

29. p. 275, caption to Figure 9.4. "solid line" should be "dashed line".

30. p. 290 Figure 9.10 is incorrect. It should be thus:

In the caption for figure 9.10, "$N_{2.5,\sigma}/\sigma$" should be "$N_{2.5,\sigma}$". The inset formula at the bottom of the page should read

$$|B_{n,p}(k) - N_{np,\sigma}(k)| \text{ is } O\left(\frac{1}{n}\right)$$

31. p. 293, Exercise 9.3, second line. "$P(X = 1) = 0.5; P(X = 2) = 0.4;$" should be "$P(X = 0) = 0.5; P(X = 1) = 0.4;$".

32. p. 293, Problem 9.1, second line. "doctors office" should be "doctor's office".

33. p. 200 line 12: "arc in the model from u to v" should be "arc in the model from v to u".

34. p. 333 Example 11.3 line 6: "posts" should be "posits".

3

35. p. 334-335. On p. 334 I use Ω to mean the set of all data sets. On p. 335 I use Ω to mean a set of hypotheses. Change the two occurrences of Ω on p. 335 (lines 5 and 8) to Θ.

36. p. 334 item 2. "P($\neg$T|Q)" should be "P(T|Q)".

37. p. 336, Exercise 11.2 last sentence: "As in Exercise11.2" should be "As in Exercise 11.1".

38. p. 339 line -14. "whether the point is in Q" should be "whether the point is in R".

39. p. 339 line -9. "standard deviation $50\sqrt{p(1-p)/N}$" should be "standard deviation $100\sqrt{p(1-p)/N}$".

40. p. 339 line -7. "95% confidence interval [5.22, 6.10]" should be "95% confidence interval [5.21, 6.11]".

41. p. 339 line -3. "confidence interval [2.64, 3.44]" should be "confidence interval [2.80, 3.44]"

42. p. 342 line -6. "standard deviation of $\sqrt{p(1-p)/N}$" should be "standard deviation of $|Q|\sqrt{p(1-p)/N}$".

43. p. 345, section 12.5, line 1: $\sum_{x \in Q}$ should be $\sum_{x \in Q} f(x)$.

44. p. 381. Delete problem 13.1, which is simply confused.