

[June 24, 2020]

*Matrix Tricks for Linear Statistical Models:  
Our Personal Top Twenty*

Slips of the Mouse<sup>1</sup>

- (1) Preface, page ix, line 22:  
Replace “practicing” with “practising”.
- (2) Ch. 0, page 1, line 4 above (0.1):  
Remove “a” before “confidence”.
- (3) Ch. 0, page 18, line 7 below (0.83):  
Add “normal” before “random”.
- (4) Ch. 0, page 26, line 2 of item (c):  
Replace “ $\mathbf{W}$  is positive definite” with “ $\Sigma$  is positive definite”.
- (5) Ch. 0, page 40, line above (0.196a):  
Replace “is so” with “is **such a**”.
- (6) Ch. 0, page 48, Exercise 0.7(b):  
Replace “ $\mathbf{Y}'\mathbf{1}_n = \mathbf{r}$ ” with “ $\mathbf{Y}'\mathbf{1}_n = \mathbf{c}$ ”.
- (7) Ch. 1, page 67, line 10 of Exercise 1.8:  
Replace “tobe” with “to be”.
- (8) Ch. 3, page 103, Exercise 3.3:  
Replace “ $\frac{1}{2} \det(\mathbf{U})$ ” with “ $\frac{1}{2} |\det(\mathbf{U})|$ ”.
- (9) Ch. 4, page 114, line 4:  
Replace “(4.58)” with “(4.59)”.
- (10) Ch. 4, page 115, end of display (4.70):  
Replace “,” with “.”.
- (11) Ch. 4, page 116, line 24:  
Replace “comes” with “becomes”.
- (12) Ch. 4, page 119, Exercise 4.5:  
Replace “Confirm” with “Confirm or deny”.
- (13) Ch. 5, page 122, line –4:  
Replace “becomes” with “follows”.

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<sup>1</sup>Thanks go to Götz Trenkler, Kimmo Vehkalahti, Richard William Farebrother, Karl Gustafson, Seppo Mustonen and Nicholas J. Cox.

- (14) Ch. 5, page 123, line 1 in References:  
Replace “Th. 4” with “Th. 9”.
- (15) Ch. 5, page 124, last three lines:  
Replace “ $\mathbf{VM}$ ” with “ $\mathbf{MV}$ ” and replace (twice) “ $\begin{pmatrix} \mathbf{V} & \mathbf{X} \\ \mathbf{X}' & \mathbf{0} \end{pmatrix}$ ” with “ $\begin{pmatrix} \mathbf{V} \\ \mathbf{X}' \end{pmatrix}$ ”.
- (16) Ch. 8, page 161, display (8.39a):  
Delete (once) “ $\mathbf{P}_{\mathbf{X}_1} + \mathbf{P}_{\mathbf{M}_1 \mathbf{X}_2}$ ”.
- (17) Ch. 8, page 166, line 1 below display (8.84):  
Replce “159” with “160”.
- (18) Ch. 8, page 171, last line:  
Delete “cross”.
- (19) Ch. 8, page 187, display on line 4:  
Replace “ $\frac{\mathbf{y}'(\mathbf{H}-\mathbf{J}_n)\mathbf{y}}{\mathbf{y}'\mathbf{M}\mathbf{y}}$ ” with “ $\frac{\mathbf{y}'(\mathbf{H}-\mathbf{J}_n)\mathbf{y}/(g-1)}{\mathbf{y}'\mathbf{M}\mathbf{y}/(n-g)}$ ”.
- (20) Ch. 8, p. 190, Ex. 8.21, last line:  
Add the sentence “Confirm that
- $$\mathcal{C}(\mathbf{P}_A : \mathbf{P}_B) = \mathcal{C}(\mathbf{P}_A \mathbf{P}_B) \oplus \mathcal{C}(\mathbf{P}_A \mathbf{Q}_B) \oplus \mathcal{C}(\mathbf{P}_B \mathbf{Q}_A),$$
- for which the commutativity  $\mathbf{P}_A \mathbf{P}_B = \mathbf{P}_B \mathbf{P}_A$  is not needed.”
- (21) Ch. 9, page 199, line –13:  
Replace “craphics” with “graphics”.
- (22) Ch. 9, page 201, line 2:  
Remove “a” before “related”.
- (23) Ch. 10, page 216, display (10.3a):  
Replace “ $\mathbf{T}'_i \mathbf{T}_i = \mathbf{I}_{m_i}$ ” with “ $\mathbf{T}'_{\{i\}} \mathbf{T}_{\{i\}} = \mathbf{I}_{m_i}$ ”
- (24) Ch. 10, page 227, line –2:  
Replace “orienteered” with “oriented”.
- (25) Ch. 10, page 229, display (10.81):  
Replace “ $\beta_i$ ” with “ $\beta_j$ ”.
- (26) Ch. 10, page 237, line 6:  
Replace “ $\psi_{12} = 0$ ” with “ $\psi = 0$ ”.
- (27) Ch. 10, page 240, displays (10.135) and (10.138):  
Replace “ $\cos^2(\mathbf{Vz}, \mathbf{z})$ ” with “ $\cos(\mathbf{Vz}, \mathbf{z})$ ”.
- (28) Ch. 10, page 244, display (10.180b):  
Replace “ $\text{cc}_i^2(\mathbf{X}'\mathbf{y}, \mathbf{Z}'\mathbf{y})$ ” with “ $\text{cc}_{p-i+1}^2(\mathbf{X}'\mathbf{y}, \mathbf{Z}'\mathbf{y})$ ”.

- (29) Ch. 10, page 248, display (10.208):  
 Replace “ $\mathbf{B} = (\mathbf{X}\mathbf{W}^{-}\mathbf{X})^{-}\mathbf{X}'\mathbf{W}^{-}$ ” with “ $\mathbf{B} = (\mathbf{X}'\mathbf{W}^{-}\mathbf{X})^{-}\mathbf{X}'\mathbf{W}^{-}$ ”.
- (30) Ch. 10, page 249, paragraph below (20.212):  
 Replace “ $(\mathbf{X} : \mathbf{0})$ ” with “ $(\mathbf{X}_f : \mathbf{0})$ ”,  
 and “ $(\mathbf{X} : \mathbf{V}_{21}\mathbf{M})$ ” with “ $(\mathbf{X}_f : \mathbf{V}_{21}\mathbf{M})$ ”.
- (31) Ch. 10, page 250, last paragraph:  
 Replace “ $\begin{pmatrix} \mathbf{y} \\ \mathbf{y}_f \end{pmatrix}$ ” with “ $\begin{pmatrix} \mathbf{y} \\ \mathbf{y}_f \end{pmatrix}$ ”.
- (32) Ch. 10, page 259, line 2:  
 Replace “ $\mathbf{A}\mathbf{y}$ ” with “ $\mathbf{S}\mathbf{y}$ ”.
- (33) Ch. 10, page 259, line 13:  
 Replace “exist” with “exists”.
- (34) Ch. 11, page 271, line –8:  

$$\mathbf{V}_2 = \alpha \mathbf{V}_1 + \mathbf{X}\mathbf{N}_1\mathbf{X}' + \mathbf{V}_1\mathbf{M}\mathbf{N}_2\mathbf{M}\mathbf{V}_1, \text{ for some } \alpha \in \mathbb{R}, \mathbf{N}_1 \text{ and } \mathbf{N}_2,$$
- (35) Ch. 13, page 300, line 1 below (13.64):  
 Replace  
 “where  $\mathbf{A}_{11}$  is a square matrix. Then, according to (a) and (b) of Section 13.1 (p. 294),”  
 with  
 “where  $\mathbf{A}_{11}$  and  $\mathbf{A}_{22}$  are nonsingular square matrices. Then, according to (3.14) and (3.16) (p. 293),”
- (36) Ch. 13, page 301, display (13.72):  
 Replace “where  $\alpha \in \mathbb{R}$ ” with “where  $\alpha \neq -(\mathbf{f}'\mathbf{E}^{-1}\mathbf{f})^{-1}$ ”
- (37) Ch. 13, page 304, Ex.13.7:  
 Replace “ $0 \neq \alpha \in \mathbb{R}$ ” with “ $0 < \alpha \in \mathbb{R}$ ”.  
 Add “Albert (1972, Ex. 4.9.9c)” as a reference.
- (38) Ch. 15, page 317, line 1 below (15.1):  
 Add “of” before “the”.
- (39) Ch. 15, page 324, line 2 below (15.54):  
 Replace “belongs” with “belongs to”.
- (40) Ch. 15, page 330, line –9:  
 Remove “a” before “convenience”.
- (41) Ch. 15, page 334, line 1 below (15.119):  
 Replace “(c)” with “(b)”.
- (42) Ch. 15, page 336, display (15.135):  
 Replace “ $\mathbf{F}\mathbf{y}$ ” with “ $\mathbf{F}\mathbf{G}_2\mathbf{y}$ ”.
- (43) Ch. 16, page 343, motto:  
 Replace “extension” with “exception”.

- (44) Ch. 16, page 346, item (vii):  
Replace “a” with “the”.
- (45) Ch. 16, page 352:  
Display (17.21): Replace “:=” with “=:”.  
Line –7: Replace “132” with “133”.
- (46) Ch. 17, page 356, line –5:  
Replace “in Darlington, Yorkshire” with  
“near Darlington, in Yorkshire”.
- (47) Ch. 18, page 357, display (18.1):  
Replace “ $\mathbf{\Lambda T}$ ” with “ $\mathbf{T\Lambda}$ ”.
- (48) Ch. 18, page 369, display (18.87b):  
Replace “ $\mathbf{x}'\mathbf{A}\mathbf{w}_j = 0$ ” with “ $\mathbf{x}'\mathbf{B}\mathbf{w}_j = 0$ ”.
- (49) Ch. 18, page 386, Exercise 18.1:  
Replace “ $\mathbf{a}$ ” with “ $a$ ”.
- (50) Ch. 19, page 392, line 4 below (19.5):  
Replace “ $\mathbf{0}$ ” with “ $\boldsymbol{\mu}$ ”.
- (51) Ch. 19, page 412, line –3:  
Remove “a” before “sample”.
- (52) References, page 412, Banachiewicz (1937b):  
Replace “lineare” with “linearer”.
- (53) Subject Index, page 480,  $\mathcal{C}(\mathbf{A}) \cap \mathcal{C}(\mathbf{B})$ , several properties:  
Add “343”.