Errata and Updates for ASM Exam MAS-II (Third Edition Second Printing) Sorted by Page

[7/26/2023] On page 36, replace the solution to Example 4C part 2 with

The median cannot be calculated by hand. Using Excel's `BETA.INV(0.5,4,8)` we get approximately **0.324**.

[3/14/2023] On page 99, in exercise 10.3, on the second line, an x is missing in the exponent. The formula should read

$$f(x \mid \lambda) = \lambda e^{-\lambda x} \qquad x > 0$$

Two lines after the formula, change 0.000001 to 0.0000001.

[3/13/2023] On page 99, in exercise 10.4, on the second line, an x is missing in the exponent. The formula should read

$$f(x \mid \lambda) = \lambda e^{-\lambda x} \qquad x > 0$$

[2/17/2022] On page 129, in exercise'11.13, on the line below the table, change "given than" to "given that".

[3/13/2023] On page 172, two lines above equation (16.2), in the fraction, put a bar above X_i so that it reads

$$\frac{\sum_{j=1}^{n}(X_{ij} - \bar{X}_i)^2}{n-1}$$

[5/8/2022] On pages 180–181, Example 16E is not solved correctly, since $\bar{x} = 1420$. If it is solved correctly, the VHM is negative, resulting in no credibility.

Here ia a revised example:

EXAMPLE 16E You have the following experience for two group policyholders for one year:

Group	Number of members	Mean loss	Standard deviation of loss
A	68	1500	1800
B	32	1000	2200

Using nonparametric empirical Bayes estimation, calculate anticipated losses per member for each group.

SOLUTION: The overall mean is

$$\bar{x} = \frac{68(1500) + 32(1000)}{100} = 1340$$

The expected process variance is obtained by pooling the variances of the two groups. We use the numbers of members to do this.

$$\widehat{v} = \frac{1800^2(67) + 2200^2(31)}{98} = 3{,}746{,}122$$

The denominator of the VHM is

$$100 - \frac{68^2 + 32^2}{100} = 43.52$$

The variance of hypothetical means is

$$\widehat{a} = \frac{68(1500-1340)^2 + 32(1000-1340)^2 - 3{,}746{,}122}{43.52} = 38{,}921.82$$

The credibility factor is

$$\hat{k} = \frac{3{,}746{,}122}{38{,}921.82} = 96.247$$
$$\hat{Z}_A = \frac{68}{68 + 96.247} = 0.414010$$
$$\hat{Z}_B = \frac{32}{32 + 96.247} = 0.249518$$

The mean that balances the estimators is

$$\hat{\mu}_X = \frac{0.414010(1500) + 0.249518(1000)}{0.414010 + 0.249518} = 1311.98$$

The credibility estimates are

$$P_A = 0.414010(1500) + 0.585990(1311.98) = \boxed{\mathbf{1389.82}}$$
$$P_B = 0.249518(1000) + 0.750482(1311.98) = \boxed{\mathbf{1234.13}}$$ □

[3/31/2022] On page 192, replace the solution to exercise 16.15 with

$$m = 357 + 222 + 181 = 760$$
$$\bar{x} = \frac{357(890) + 222(589) + 181(431)}{760} = 692.76$$
$$\widehat{v} = \frac{356(1000^2) + 221(400^2) + 180(400^2)}{760 - 3} = 555{,}033$$
$$\widehat{a} = \frac{357(890 - 692.76)^2 + 222(589 - 692.76)^2 + 181(431 - 692.76)^2 - 2(555{,}033)}{760 - (357^2 + 222^2 + 181^2)/760} = 56{,}922.51$$
$$k = \frac{555{,}033}{56{,}922.51} = 9.7507$$

The credibility factors are

$$Z_1 = \frac{357}{357 + 9.7507} = 0.9734$$
$$Z_2 = \frac{222}{222 + 9.7507} = 0.9579$$
$$Z_3 = \frac{181}{181 + 9.7507} = 0.9489$$

The credibility-weighted mean, and the prediction, are

$$\bar{x}^{\text{CRED}} = \frac{0.9734(890) + 0.9579(589) + 0.9489(431)}{0.9734 + 0.9579 + 0.9489} = 638.67$$
$$P_C = (0.9734)(890) + (1 - 0.9734)(638.67) = \boxed{\mathbf{883.3}}$$

[11/1/2022] On page 198, in the paragraph beginning with "1.", on the last line, change "would it" to "would fit".

[8/22/2023] On page 201, on the third line of Example 17A, change "a linear mixed models" to "a linear mixed model". In part 2 (the last line of the page), change "random student" to "random tenth grade student".

[11/1/2022] On page 229, the last line of the solution to exercise 19.6, "Later on in the course ...", belongs after the solution to exercise 19.5, and is not correct for exercise 19.6.

[8/22/2023] On page 232:

- Three lines above the table before Section 26.2, change "Kenward-Rogers" to Kenward-Roger"
- In the table before Section 26.2, change "Kenwood-Rogers" to "Kenward-Roger".

[8/22/2023] On page 235, in the paragraph beginning "**Newton-Raphson (N-R)**", on the first line, change "maximizes" to "minimizes".

[8/22/2023] On page 242, on the second line of Example 21D, change "nor" to "not".

[8/22/2023] On page 243, four lines under equation (21.3), change "Kenward-Rogers" to "Kenward-Roger".

[8/17/2022] On page 266, in exercise 24.2, on the first line, change "variable" to "variables".

[8/17/2022] On page 270, in the solution to exercise 24.1, on the line under "Level 1", delete the duplicate "$u_{3k} \times \mathrm{VAR3}_k$".

[8/17/2022] On page 271, replace the solution to exercise 24.2 with

Level 1

$$\mathrm{ACCIDENTS}_{ij} = b_0 + b_1 \times \mathrm{SEX}_{ij} + b_2 \times \mathrm{TICKETS}_{ij} + b_3 \times \mathrm{ACC}_{ij} + \varepsilon_{ij}$$

Level 2

$$\begin{aligned} b_0 &= \beta_0 + \beta_4 \times \mathrm{REGISTRATIONS}_j + \beta_5 \times \mathrm{ROADMILES}_j + u_{0j} \\ b_1 &= \beta_1 + u_{1j} \\ b_2 &= \beta_2 + u_{2j} \\ b_3 &= \beta_3 + u_{3j} \end{aligned}$$

[2/14/2023] On page 275, on the second line from the end of the page, change $\hat{\beta}_1 = 0.78125$ to $\hat{\beta}_1 = 0.5$. Also put a hat on the β_1 at the end of the line.

[3/6/2022] On page 302, replace the solution to exercise 26.6 with

Mean Group #3 splits the treatments into four categories: {2}, {1,3}, {4,6}, {5,7,8}. This is 2 more categories than Mean Group #1, for which R indicates 1469 degrees of freedom. Thus a model using Mean Group #3 would have **1467** degrees of freedom for each fixed effect. Notice that the full model, with all 8 treatments, has 1463 degrees of freedom, four less than mean group #3 which has four fewer groups than the full model, and two more than mean group #1 which has two fewer groups than mean group #3.

[3/29/2022] On page 310, one under the first table, change "grid-approximated prior" to "grid-approximated posterior".

[4/21/2023] On page 321, in the solution to exercise 28.5, on the second line, replace $x(1-x)^5$ with $x(1-x)^4$, so that the line reads

$$\big(x^2(1-x)\big)\big(x(1-x)^4\big) = x^3(1-x)^5$$

[11/1/2022] On page 328, on the first displayed line, change the second $10\sqrt{2\pi}$ denominator to $\sqrt{2\pi}$ (delete the 10) and change the second 200 denominator to 2, so that the displayed line reads

$$\frac{1}{10\sqrt{2\pi}} \exp\left(-\frac{(\beta_0-50)^2}{200}\right) \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{(\beta_1-5)^2}{2}\right)\left(\frac{1}{20}\right)$$

[3/13/2023] On page 362, delete the footnote.

[11/3/2022] On page 416, replace the solution to exercise 34.9 with

The first sum of two consecutive ρs that is negative is $0.015-0.02$, so $t = \boxed{\mathbf{35}}$.

[3/13/2023] On page 423, 3 lines from the bottom of the page, change "λ_i = log_exposures..." to "$\ln\lambda_i$ = log_exposures..."

[3/22/2022] On page 438, one line above Section 36.4, change "highest WAIC" to "lowest WAIC".

[3/22/2022] On page 446, in the solution to exercise 36.3, on the seventh line, change 0.177759 to 0.717759..

[9/8/2022] On page 480, in exercise 38.10, in the three bullets, the models should be numbered as Model I, Model II, and Model III respectively.

[3/13/2023] On pages 487–514, replace every "cross-entropy" with "entropy".

[3/13/2023] On page 478, on the line above the first displayed expression, change "mean square error" to RSS. One line and three lines below the displayed expression, change MSE to RSS.

[3/13/2023] On page 489, delete footnote 1.

[3/13/2023] On page 510, replace the solution to exercise 39.5 with the following:

Splits I and III don't split at all; all observations go into R_2. Split II puts (4,1) into R_2 and everything else into R_1. There is no error for (4,1), whereas the error of the other 5 is the square difference from the mean, or the population (division by 5) variance times 5, which is 0.548. Split IV puts (1,0) into R_1 and everything else into R_2. Once again, we can compute the RSS as the variance in R_2, or 0.2824, times 5, or 1.412. Split V puts two observations, (3,2) and (2,2), into R_2 and the others into R_1. The variance of the observations in R_1 is 0.451875 so the sum of squares is $4(0.451875) = 1.8075$. The RSS for R_2 is $(1.5-1.75)^2 + (2-1.75)^2 = 0.125$. The total RSS for this split is $1.8075+0.125 = 1.9325$. Split II minimizes the RSS. **(B)**

[3/29/2021] On page 511, in the solution to exercise 39.9, on the fifth line, change "$86+82+81+4(9) = 286$ to $82+81+11+86+4(9) = 296$.

[3/13/2023] On page 516, in the table, change x_{62} from 1 to -1.

[5/10/2022] On page 593, in question 33, change the WAIC for model2 from 106.1 to 108.1.

[8/22/2023] On page 637, in question 13 II, change "Kenward-Rogers" to "Kenward-Roger".

[11/1/2022] On page 771, in the solution to question 4, on the second to last line, change $\dfrac{0.1(\mu_s^2+\sigma_s^2)}{0.2\mu_s^2}$ to $\dfrac{0.1(\mu_X^2+\sigma_X^2)}{0.2\mu_X^2}$.

[5/8/2022] On page 776, in the solution to question!33 statement I, change 96.7 to 96.2.

[5/10/2022] On page 789, vhange the answer key for question 18 from (A) to (B).

[8/22/2023] On page 805, in the solution to question 13 II, change "Kenward-Rogers" to "Kenward-Roger".

[11/1/2022] On page 806, in the solution to question 21, change the numbering to I, II, III, and change III to

The WAIC calculation changes when data is aggregated since the aggregated likelihoods are multiplied by binomial coefficients. $\times$

Change the answer key to **(E)**.