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

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

[8/22/2021] On page 129, in exercise 12.15, in the fourth through sixth bullets, change "Risk group R" to "Risk group T".

[8/22/2021] On page 129, in exercise 12.16, on the tenth line, change "Group SR" to "Group S".

[7/23/2021] On page 161, in the solution to exercise 14.14, replace the first two lines with:

Expected claims are $0.2(1800) = 360$. The limited fluctuation estimate is based on a credibility factor of $Z = \sqrt{360/1083} = 0.5766$, and is

$$0.5766\left(\frac{200}{1800}\right) + (1 - 0.5766)(0.2) = 0.1488$$

Replace the last line with:

The percentage change is $0.1724/0.1488 - 1 = \boxed{\textbf{+15.91\%}}$. **(E)**

[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.

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

The denominator of the VHM is

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

The variance of hypothetical means is

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

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

$$P_A = 0.414010(1500) + 0.585990(1311.98) = \boxed{\textbf{1389.82}}$$

$$P_B = 0.249518(1000) + 0.750482(1311.98) = \boxed{\textbf{1234.13}} \qquad \square$$

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

$$m = 357 + 222 + 181 = 760$$

$$\bar{x} = \frac{357(890) + 222(589) + 181(431)}{760} = 692.76$$

$$\widehat{\text{EPV}} = \frac{356(1000^2) + 221(400^2) + 180(400^2)}{760 - 3} = 555{,}033$$

$$\widehat{\text{VHM}} = \frac{357(890 - 692.76)^2 + 222(589 - 692.76)^2 + 181(431 - 692.76)^2 - 2(555{,}033)}{760 - (357^2 + 222^2 + 181^2)/760} = 56{,}922.51$$

$$k = \frac{555{,}033}{56{,}922.51} = 9.7507$$

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

$$\bar{x}^{\text{CRED}} = \frac{0.9734(890) + 0.9579(589) + 0.9489(431)}{0.9734 + 0.9579 + 0.9489} = 638.67$$

$$P_C = (0.9734)(890) + (1 - 0.9734)(638.67) = \boxed{\textbf{883.3}}$$

[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 $\boxed{\textbf{1467}}$ 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".

[8/3/2021] On page 386, in equation (33.1), change θ_{prop} to $p(\theta_{\text{prop}}$ and θ_{curr} to $p(\theta_{\text{curr}}$, where p is the prior density function.

[8/3/2021] On page 388, in equation (33.1), the right parenthesis after "Data" in the denominator should be moved to after θ_{curr}, also in the denominator.

[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..

[9/9/2021] On page 485, in the solution to exercise 38.10, on the last line, change "one N" to "two Ns".

[9/9/2021] On page 486, in the solution to exercise 38.15, the signs of the ε_i in the table should be reversed; they should also be reversed in the two fractions two and five lines below the table. Thus the table and the following lines should read:

X_i in training set	Nearest two points	Fitted value	Y_i	ε_i
4	4,12	$\frac{3+15}{2} = 9$	3	-6
7	4,12	$\frac{3+15}{2} = 9$	8	-1
12	12,14	$\frac{15+22}{2} = 18.5$	15	-3.5
14	14,15	$\frac{22+30}{2} = 26$	22	-4
15	14,15	$\frac{22+30}{2} = 26$	30	4
21	15,22	$\frac{30+53}{2} = 41.5$	40	-1.5
22	15,22	$\frac{30+53}{2} = 41.5$	53	11.5

The MSE on the training data is

$$\frac{(-6)^2 + (-3.5)^2 + (-4)^2 + 4^2 + 11.5^2}{5} = \boxed{\textbf{42.5}}$$

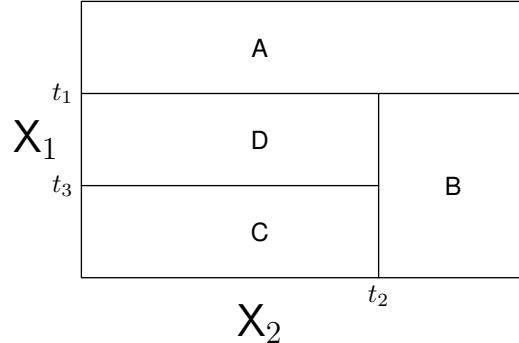We divide by 5 since no parameters are estimated.

The MSE on the test data is

$$\frac{(-1)^2 + (-1.5)^2}{2} = \boxed{\textbf{1.625}}$$

[9/9/2021] On page 494, in formula (39.5), a 2 is missing from the numerator. The formula is

$$\text{Residual mean deviance} = -\frac{2\sum_m \sum_k n_{mk} \ln \hat{p}_{mk}}{n - |T|}$$

[10/3/2021] On page 498, in the graph of answer choice (B), t_1 and t_3 should be interchanged, so that the graph looks like this:

[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 $82 + 81 + 11 + 86 + 4(9) = 296$.

[8/24/2021] On page 526, exercise 40.5, while the exercise can be worked out, the second and third bullets are false. The first principal component loading for X_1 is $1/\sqrt{2}$, and the first principal component loading for X_2 is negative.

[9/9/2021] On page 543, in the sidebar, 2–3 lines below the displayed equation, switch i and i^*: "once for each i (for the first summand) or for each i^* (for the second summand)".

[9/9/2021] On page 555, in exercise 41.21, replace the last line with the answer choices:

(A) I only   (B) II only   (C) III only   (D) I, II, and III
(E) The correct answer is not given by (A) , (B) , (C) , or (D) .

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

[9/26/2021] On page 763, replace the solution to question 1 with:

Model 4 is nested within Model 3 which is nested in Model 2 which is nested in Model 1. Model 2 is also nested within Model 5.

Model 2 deletes one random effect from Model 1, so REML is needed for both of them. Model 3 deletes a fixed effect from Model 2, so ML is needed for both. Model 4 deletes a random effect from Model 3, so REML is needed for both of them. We see that the REML runs of Model 1, Model 2, and Model 3 are all used. REML and Model 2 REML are used, but Model 3 REML is not used. **(E)**

[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).