Errata and Updates for ASM Exam MAS-I (First Edition Second Printing) Sorted by Date

Practice Exam 5 Question 6 is defective. See the correction to the question below. In Practice Exam 6 Question 11, the answer ranges are suitable for an annuity of 1 per year rather than 50,000 per year.

[11/6/2018] On page 330, on lines 6 through 9 from the bottom of the page, add a factor b before each k:

$$bk_5(16) = \frac{e^{-((16-5)^2)/2(8^2)}}{\sqrt{2\pi}} = 0.155012$$
$$bk_{12}(16) = \frac{e^{-((16-12)^2)/2(8^2)}}{\sqrt{2\pi}} = 0.352065$$
$$bk_{15}(16) = \frac{e^{-((16-15)^2)/2(8^2)}}{\sqrt{2\pi}} = 0.395838$$
$$bk_{20}(16) = \frac{e^{-((16-20)^2)/2(8^2)}}{\sqrt{2\pi}} = 0.352065$$

[10/28/2018] On page 159, in the solution to exercise 14.9, on the first line, change "with mean 1" to "on $[0, 1]$".

[10/28/2018] On page 206, two lines after formula (18.2), change $1-10(0.9^9) = 0.964844$ to $1-10(0.5^9) = 0.980469$.

[10/28/2018] On page 292, in the box before exercises 24.8 and 24.9, on the third line, change "geometric" to "gamma".

[10/28/2018] On page 295, change the first two lines of the solution to exercise 24.7 to

$$c = \max\left(\frac{f(x)}{g(x)}\right)$$
$$\frac{f(x)}{g(x)} = \frac{xe^{-x}}{1/(1+x)^2}$$

[10/28/2018] On page 314, in the solution to exercise 25.24, on the third line, change "by θ" to "be θ.

[10/28/2018] On page 549, in exercise 36.22, in the third bullet, change all 4 denominators from n to $\sqrt{n}$.

[10/28/2018] On page 599, in the solution to exercise 40.3, on thee fifth line, change $\lambda^{-n\bar{X}}$ to $\lambda^{n\bar{X}}$.

[10/28/2018] On page 601, in the solution to exercise 40.9, on the second-to-last line, change the -2 at the beginning of the line and the -2 after "or" to 2; remove the minus signs.

[10/28/2018] On page 603, on the third line of the third paragraph, change "20$^{\text{th}}$ percentile" to "15$^{\text{th}}$ percentile".

[10/28/2018] On page 606, in the solution to exercise 41.4, on the first line, change $(3, 8)$ to $(5, 8)$.

[10/28/2018] On page 825, in the solution to exercise 55.14, item 2, change "latter takes the response into account" to "former takes the response into account".

[10/28/2018] On page 905, in the solution to exercise 64.5, on the second to last line, delete the "is derived" that is before "by".

[10/28/2018] On page 1008, in the solution to question 34, on the first displayed line, change the denominator $2\pi x^2$ to $2\pi x^3$.

[10/28/2018] On page 1012, in the solution to question 11, on the last line, change $\dfrac{l_{52}}{l_{51}}$ to $\dfrac{l_{53}}{l_{52}}$.

[10/28/2018] On page 1056, in the solution to question 11, on the last line, 13.883 should be multiplied by 50,000 to obtain a final answer of **694,150**.

[10/28/2018] On page 1063, in the solution to question 45, on the second and fourth lines (once apiece), change $\mathrm{Cov}(x_t, x_{t+1})$ to $\mathrm{Cov}(x_t, x_{t+2})$.

[10/25/2018] On page 840, in the box for exercises 57.2 and 57.3, in the table for centered moving averages, change the entry for 2011Q3 from 127.65 to 127.625.

[10/18/2018] On page 891, change formula (63.7) to

$$\text{Forecast error} = s_w\sqrt{\sum_{i=0}^{t-1} a^{2i}}$$

[10/18/2018] On page 892, in formula (63.7), change a^i to a^{2i}.

[10/12/2018] On page 968, in question 6, in the two bullets, change "payment per loss" to "payment per payment". Change the last line of the question to

Calculate the percentage increase in the variance of payment per loss in 2016 over 2015.

[9/30/2018] On page 1029, replace the solution to question 41 with

The variance of the terms in the series, by formula (62.3), is

$$\sigma^2 = 4(1 + 0.8^2 + 0.6^2) = 8$$

The nonzero autocorrelations for the MA(2) series are at lags 1 and 2, based on formula (62.5).

$$\rho_1 = \frac{0.8 + (0.8)(0.6)}{1 + 0.8^2 + 0.6^2} = 0.64$$
$$\rho_2 = \frac{0.6}{1 + 0.8^2 + 0.6^2} = 0.3$$

Using formula (61.1), the variance of the sample mean is

$$\begin{aligned}\mathrm{Var}(\bar{x}_t) &= \frac{\sigma^2}{n}\bigl(1 + 2(1 - 1/n)(\rho_1) + 2(1 - 2/n)(\rho_2)\bigr)\\ &= \frac{8}{10}\bigl(1 + 2(0.9)(0.64) + 2(0.8)(0.3)\bigr) = \boxed{\mathbf{2.1056}} \qquad \textbf{(E)}\end{aligned}$$

[9/13/2018] On page 1176, replace the solution to question 19 with

Since $n/(n+4) \to 1$ as $n \to \infty$, the limit of $\mathbf{E}[\hat{\alpha}_n]$ is 7, making statement I true.

The mean square error of $\hat{\alpha}_8$ is the square of the bias plus the variance:

$$\mathrm{bias}_{\hat{\alpha}_8}(\alpha) = \frac{7(8)}{8+4} - 7 = 2\tfrac{1}{3}$$
$$\mathrm{Var}(\hat{\alpha}_8) = \frac{140(7)}{15} = 65\tfrac{1}{3}$$
$$\mathrm{MSE}(\hat{\alpha}_8) = (2\tfrac{1}{3})^2 + 65\tfrac{1}{3} = 70\tfrac{7}{9}$$

The variance approaches 70 from below as $n \to \infty$, since

$$\lim_{n\to\infty} \frac{n-1}{2n-1} = \frac{1}{2}$$

and

$$\frac{n-1}{2n-1} < \frac{n-1}{2n-2} = \frac{1}{2}$$

Since $70\frac{7}{9} > 70$, statement II is true.

Since the variance does not go to 0, we cannot be sure that $\hat{\alpha}_n$ is consistent, so statement III is false. **(B)**

[8/31/2018] On page 153, in the solution to exercise 13.30, on the first displayed line, change $10 + 7e^{-(10-x)/7}$ to $10 - 7e^{-(10-x)/7}$.

[8/12/2018] On page 642, change the first two lines of exercise 44.15 to

In a cumulative proportional odds model for an ordinal variable, the fitted model is

$$\ln \frac{\sum_{i=1}^{j} \hat{\pi}_i}{1 - \sum_{i=1}^{j} \hat{\pi}_i} = b_{0j} + b_1 x_1$$

[8/12/2018] On page 649, in the solution to exercise 44.23, two lines from the end, change $\Phi(1.01)$ to $\Phi(1.32)$.

[8/12/2018] On page 1137, in the solution to question 33, on the second line, put "ln" before $\dfrac{\mu}{1-\mu}$.

[8/8/2018] On page 719, exercise 48.16 is a duplicate of exercise 48.13.

[8/8/2018] On page 720, in exercise 48.17, on the second line of the second bullet, put a period after 0.940. The statement beginning "A second regression equation" should be moved to a third bullet.

[8/8/2018] On page 727, in the solutions to exercises 48.10 and 48.11, on the displayed line in each solution, SSE_R and SSE_{UR} should be interchanged so that the numerator is $(\text{SSE}_\text{R} - \text{SSE}_\text{UR})/q$. In addition, in the solution to exercise 48.11, put parentheses around $n-p$ in the denominator.

[8/8/2018] On page 727, in the solution to exercise 48.13, on the first and second lines, delete the sentence fragment "The unrestricted model with 8 variables."

[8/8/2018] On page 727, in the solution to exercise 48.14, on the displayed line, change $n-k$ to $n-p$.

[8/8/2018] On page 737, in exercise 49.2, in the first bullet, change $\hat{y}$ to $\hat{y}_i$.

[8/8/2018] On page 737, in the solution to exercise 49.2, on the second line, change $\hat{y}$ to $\hat{y}_i$. Replace the last line with

$$r_3 = \frac{\hat{\varepsilon}_3}{s\sqrt{1-h_{33}}} = \frac{1.2}{2\sqrt{1-0.6}} = \boxed{\mathbf{0.948683}}$$

[8/8/2018] On page 811, in the solution to exercise 54.2, on the second line, replace "6 models" with "7 models" and replace "5" with "6".

[8/8/2018] On pages 811–812, replace the solution to exercise 54.10 with

The mean squared error of the full model is $284/(60-5) = 5.163636$. Then

$$\begin{aligned}
C_p(0) &= \frac{326}{60} = 5.4333\\
C_p(1) &= \frac{314 + 2(5.163636)}{60} = 5.4055\\
C_p(2) &= \frac{303 + 2(2)(5.163636)}{60} = 5.3942\\
C_p(3) &= \frac{293 + 2(3)(5.163636)}{60} = 5.4000\\
C_p(4) &= \frac{284 + 2(4)(5.163636)}{60} = 5.4218
\end{aligned}$$

The **2-variable** model is selected.

[8/8/2018] On page 812, replace the solution to exercise 54.11 with

The estimated value of the mean square error of the model with 4 explanatory variables is

$$\hat{\sigma}^2 = \frac{\text{RSS}}{n-p} = \frac{132}{29-5} = 5.5$$

We calculate Mallow's C_p for each model.

$$\begin{aligned}
C_p(0) &= \frac{162}{29} = 5.586\\
C_p(1) &= \frac{145 + 2(1)(5.5)}{29} = 5.379\\
C_p(2) &= \frac{140 + 2(2)(5.5)}{29} = 5.586\\
C_p(3) &= \frac{136 + 2(3)(5.5)}{29} = 5.828\\
C_p(4) &= \frac{132 + 2(4)(5.5)}{29} = 6.069
\end{aligned}$$

The model with **1 explanatory variable** has the lowest C_p and is therefore the best.

[8/8/2018] On page'813, in the solution to exercise 54.14, on the fourth line, delete the first $\frac{15}{12}$, the one without parentheses.

[8/8/2018] On page 819, on the second line of Section 55.3, change "test data" to "training data".

[8/8/2018] On page 824, in the solution to exercise 55.11, on the second line, but a negative sign before $\frac{1}{2}\frac{\partial f}{\partial \beta_0}$.

[8/8/2018] On page 1182, in the solution to question 13, on the third line, change $N \geq 4$ to $N \geq 3$. On the fifth line, change "$N = 4$. **(D)**" to "$N = 3$. **(C)**". Delete the last sentence of the solution.

[8/8/2018] On page 1185, in the solution to question 32, on the third line, change "model 4" to "model 2".

[7/31/2018] On page 818, in the first displayed formula in Subsection 55.2.1, change $\bar{X}$ to $\bar{X}_j$. In the second displayed formula, change $\bar{x}_1$ to $\bar{x}_j$ and put a right parenthesis after $\bar{x}_j$.

[7/29/2018] On page 418, in exercise 29.25, on the second line, the square symbol should be on the denominator:

$$S_X(x) = \frac{\theta^4}{(\theta^2 + x^2)^2}$$

[7/26/2018] On page 873, in the solution to exercise 61.1, change the final answer to 5.83614.

[7/26/2018] On page 875, in the solution to exercise 61.14, on the first line, change 0.7 to 70 and $+0.3$ to -30.

[7/26/2018] On page 991, in question 27, on the second line, change β_2 to $\mathbf{x}_2$.

[7/26/2018] On page 991, in question 29, on the first bulleted line, insert a comma between 0.3111 and 0.5584.

[7/26/2018] On page 1038, in the solution to question 30, on the displayed line, change 1.4 in the exponent to 0.4.

[7/24/2018] On page 852, in the solution to exercise 54.13, change the final answer to -1.25.

[7/20/2018] On page 293, in the solution to exercise 24.1, change the answer key from **(C)** to **(B)**.

[7/17/2018] On page 719, in exercise 48.15, on the second line, replace $\beta_4 x_{i1} x_{i2}$ with $\beta_4 x_{i2} x_{i3}$.

[7/10/2018] On page 682, on the third line of Quiz 46-4, change "loglikehood" to "loglikelihood".

[7/10/2018] On page 791, in the solution to exercise 52.5, on the first line, delete "a" before "Poisson".

[7/6/2018] On page 635, in the fourth displayed line, on the right side in the exponent, change $\sum_{i=1}^{p}$ to $\sum_{i=2}^{p}$.

[7/5/2018] On page 1163, in the solution to question 38, on the first line, change "gamma" to "Gaussian". On the fourth line, change "$a(x) = \theta$, $\underset{\sim}{(}\theta) = -(x-1)^2/2x$" to "$a(x) = -(x-1)^2/2x$, $b(\theta) = \theta$".

[7/2/2018] On page 804, one line below formula (54.1), change "variance of the residual ε" to "residual variance of the regression".

[7/2/2018] On page 805, in the first paragraph of Example 54A, change "The variance of the residual" to "The residual variance of the regression".

[7/2/2018] On page 807, in exercises 54.8 and 54.9, change "estimated variance of the residuals" to "estimated residual variance of the regression".

[7/2/2018] On page 808, in exercise 54.10, 2–3 lines from the end, delete the sentence beginning "For each model".

[7/2/2018] On page 808, in exercise 54.11, on the first line, change 28 to 29. In the table, delete the $\hat{\sigma}^2$ column.

[7/1/2018] On page 293, in the solution to exercise 24.3, on the sixth line (the one with $u \rightarrow$), change $\sqrt{(1-u)/2}$ to $1 - \sqrt{(1-u)/2}$. Replace the last two lines of the solution with

Comparing that fraction to the second number in each pair, we have $0.55 \le 1 - 0.3 = 0.7$, $0.37 \le 1 - 0.4 = 0.6$, $0.62 \ge 0.6$, and $0.77 \le 0.8$. We accept when the second number is less than or equal to the fraction, so we accept all except the third number. The average is $(0.3 + 0.4 + 0.8)/3 = \boxed{\mathbf{0.5}}$.

[6/28/2018] On page 704, in exercise 47.20, in the first bullet, change the two subscripts on the right to $i2$ and $i3$:

$\hat{y}_i = 20.0 - 1.5x_{i2} - 2.0x_{i3}$

[6/28/2018] On page 707, in the solution to exercise 47.12, on the third line, change b_2 to b_3.

[6/28/2018] On page 712, on the first line of Example 48B, change $\beta_5 x_6$ to $\beta_5 x_5$.

[6/28/2018] On page 715, in exercise 48.2, on the second line, replace x_{i7} with x_{i6}.

[6/28/2018] On page 721, in exercise 48.21, on the last line, change $\beta_3 = 0$ to $\beta_4 = 0$.

[6/28/2018] On page 743, two lines above equation (50.1), change $\beta_0 + \beta_1 x^*$ to $\beta_1 + \beta_2 x^*$.