Errata and updates for ASM Exam SRM Study Manual (First Edition Second Printing) sorted by date

Practice Exam 5:27, 6:4, and 6:25 are defective in that none of the answer choices is correct. Practice exam 5:9 should be corrected as listed below (page 333).

[1/16/2021] On page 357, in the solution to question 33, change II and III to:

2. All we know is that when the clusters were {1}, {2}, {3}, {4}, and {5,6,7}, {4} was fused with {5,6,7}. So {4} is closer to the centroid of {5,6,7} than {3} is, and {4} is closer to the centroid of {5,6,7} then it is to {3}. None of these imply II.
3. All we know is that {3} is closer to the centroid of {4,5,6,7} than {1} is to {2}, since it was fused first. That doesn't imply III.

[12/26/2020] On page 380, in the solution to question 4, change the last line to

$$-2\left(\frac{45\ln\frac{45}{55}+10\ln\frac{10}{55}+32\ln 0.8+8\ln 0.2+10\ln 0.25+30\ln 0.75 + 5\ln 0.1+45\ln 0.9+3\ln\frac{3}{55}+52\ln\frac{52}{55}}{240-5}\right)=\boxed{\mathbf{-0.8211}}$$

None of the five answer choices is correct.

[12/20/2020] On page 242, in the solution to exercise 17.7, replace the second paragraph with

Abigael has a negative score from the first component. But we cannot tell whether that is because she purchases more food than the average customer or because she purchases less clothes, linen, ana appliances than the average customer. We cannot conclude II.

[12/20/2020] On page 264, on the fourth line of Section 19.6, change "(excess of forecast over actual) $e_t = \hat{y}_t - y_t$" to "(excess of actual over forecast) $e_t = y_t - \hat{y}_t$".

[12/20/2020] On page 281, on the ninth line under "Seasonal exponential smoothing", change $\sum_{j=1}^{SB} S_t$ to $\sum_{t=1}^{SB} S_t$.

[12/20/2020] On page 285, in exercise 21.11, change the n subscripts in y_n, $b_{0,n-1}$, and $b_{1,n-1}$ to T.

[12/20/2020] On page 285, in exercise 21.15(ii), change $\mathrm{Var}(w)$ to w.

[12/20/2020] On page 287, in the solution to exercise 21.11, change the n subscripts in $b_{0,n}$ and $b_{1,n}$ to T.

[12/20/2020] On page 288, in the solution to exercise 21.15, change $\mathrm{Var}(w)$ to w.

[12/20/2020] On page 333, in question 9, on the third line, change ϕ_{ij} to ϕ_{ji}.

[12/20/2020] On page 344, in question 15, on the first line, put parentheses around 75,41: {(75,41)}. On the last line before the answer choices, put parentheses around 60,22: {(60,22)}.

[12/20/2020] On page 370, replace the solution to question 12 with

I can be deduced. Bob may have sold a lot of life insurance but very little health and dental. It is not clear whether Sue sold a lot of dental insurance or had a high first principal component score because she sold a lot of life or health insurance. **(E)**

[12/19/2020] On page 169, in exercise 12.33, on the second line, change x_j to x_i.

[12/18/2020] On page 151, two lines below the numbered list, delete the extra period after "model".

[12/17/2020] On page 9, on the first line, add "Reading: " to the beginning of the line, before *Regression Modeling with Actuarial and Financial Applications*.

[12/17/2020] On page 64, in the solution to exercise 4.27, on the last line, change $F_{2,814}$ to $F_{3,814}$.

[12/17/2020] On page 64, in the solution to exercise 4.25, on the last line, change $F_{2,814}$ to $F_{3,814}$.

[12/17/2020] On page 75, in exercise 5.11, on the first line, change $\beta{\cdot}x_i$ to $\beta_1 x_i$.

[12/17/2020] On page 83, on the second line of the solution to Quiz 5-3, add a right parenthesis in the first denominator after $(21 - 2 - 1$.

[11/13/2020] On page 323, in question 9, assume that the means of the 4 variables are 0.

[11/4/2020] On page 11, on the last line of the solution to Example 2B, change "$\bar{y} - \hat{\beta}_0\bar{x}$" to "$\bar{y} - \hat{\beta}_1\bar{x}$".

[9/9/2020] On page 192, in equation (14.15), add a pair of parentheses to the denominator so that it is $1 - \bigl(\exp(l_0/n)\bigr)^2$.

[9/9/2020] On page 194, in equation (14.15), add a pair of parentheses to the denominator so that it is $1 - \bigl(\exp(l_0/n)\bigr)^2$.

[9/7/2020] On page 167, in the box before exercise 12.26, on the displayed line, replace the left side with $\ln \dfrac{\sum_{i\le j}\hat{\pi}_i}{1 - \sum_{i\le j}\hat{\pi}_i}$.

[9/2/2020] On page 59, in exercise 4.23, on the first line, change "experience (x_2)" to "experience (x_1)". On the second line, change ($x_3 = 1$) to ($x_2 = 1$) and change ($x_3 = 0$) to ($x_2 = 0$).

[8/30/2020] On page 133, two lines before Table 11.2, change $b(\theta) = \theta$ to $b'(\theta) = \theta$.

[8/13/2020] On page 122, in exercise 9.4(i), change $\bar{x}_2$ to $\bar{x}$.

[8/10/2020] On page 277, in the solution to exercise 20.4, every $t - 20$ should be t, and the final answer is 5. Replace the solution with

The mean of the series is 50 and the current value $y_{20} = 60$, which is 10 higher than the mean. In the forecast of an AR(1) series, each excess of a term over the mean is β_1 times the excess of the previous term over the mean. Here, $\beta_1 = 0.75$. We want the t such that $y_t = 53$, an excess of 3 over the mean, so we want $10(0.75^t) < 3$. Solving for t,

$$\begin{aligned} 10(0.75^t) &< 3 \\ 0.75^t &< 0.3 \\ t \ln 0.75 &< \ln 0.3 \\ t &> \frac{\ln 0.3}{\ln 0.75} = 4.185 \end{aligned}$$

The smallest t with $\hat{y}_{20+t} < 53$ is $\boxed{\mathbf{5}}$.

[6/16/2020] On page 178, in exercise 13.1, the last four lines of the table should be:

Family size	2	
1 or 2	0	0.000
3 or 4	1	0.137
5 or more	1	0.355

[11/21/2019] On page 83, replace the last three lines of the solution to Quiz 5-3 with

$$R^2_{(3)} = \frac{0.72}{1.72}$$

The VIF is

$$\mathrm{VIF}_3 = \frac{1}{1 - 0.72/1.72} = \boxed{\mathbf{1.72}}$$

[11/18/2019] On pages 264–265 in each of the five formulas in Section 19.6, change the lower limit of the summation from $t = T_1$ to $t = T_1 + 1$.

[10/29/2019] On page 207, in the solution to exercise 14.30, change the last 4 lines to

With $\hat{y}_i = y_i$,

$$l_{\max} = -\ln(1 \cdot 2 \cdot 3 \cdot 4 \cdot 5) - 5 = -9.7875$$

The pseudo-R^2 statistic is

$$\frac{10.4931 - 10.0002}{10.4931 - 9.7875} = \boxed{\mathbf{0.6985}}$$

[10/29/2019] On page 207, in the solution to exercise 14.33, change the final answer −0.44548 to −0.63000.

[9/1/2019] On page 268, in exercise 19.15, on the second line, replace $\mu_c \neq 0$ with $\mu_c > 0$.

[9/1/2019] On page 271, replace the solution to Example 20A with

First calculate r_1. The mean of the six terms is 45. After subtracting 45 from each term, the remainders of the time series terms are $\{10, -10, 7, -5, 1, -3\}$. The autocorrelation at lag 1 is

$$r_1 = \frac{(10)(-10) + (-10)(7) + (7)(-5) + (-5)(1) + (1)(-3)}{10^2 + (-10)^2 + 7^2 + (-5)^2 + 1^2 + (-3)^2} = -0.75$$

Then $\hat{\beta}_0 = 45 + 0.75(45) = 78.75$. The estimated values of the time series are $\hat{y}_t = 78.75 - 0.75y_{t-1}$, and the error is

$$\varepsilon_i = \hat{y}_t - y_t = 78.75 - y_t - 0.75y_{t-1}$$

We cannot calculate $\hat{y}_1$, so we can't calculate the first error. The other errors are 2.5, 0.5, −0.25, 2.75, and 2.25. The mean error is 1.55. The variance of the error is

$$\frac{1}{6-3}\left((2.5-1.55)^2 + (0.5-1.55)^2 + (-0.25-1.55)^2 + (2.75-1.55)^2 + (2.25-1.55)^2\right) = \boxed{\mathbf{2.391667}}$$

[8/30/2019] On page 157, on the third line after "Cumulative logit and proportional odds models",, change $\Pr(Y \leq j)$ to $\Pr(Y \leq m)$.

[8/30/2019] On page 251, in Figure 18.4, in the table, replace the lines for Sequence 4 and 5 with

Sequence	Link	Distance
4	{9}—{8,10}	4.924
5	{5}—{8,9,10}	7.008

In other words, interchange 5 and 9.

[8/29/2019] On page 238, in Table 17.1, on the eighth line, the one starting with "1.", change $\sum_{i=1}^{p} \sigma_{jm}^2$ to $\sum_{j=1}^{p} \phi_{jm}^2$.

[8/20/2019] On page 223, one line below the only displayed line on the page, change $f^{*b}(x)$ to $\hat{f}^{*b}(x)$ (add a hat on top of the f).

[8/20/2019] On page 224, on the first line of step 1 of the algorithm (the line after "The algorithm works as follows:"), delete "be".

[8/18/2019] On page 213, in the solution to Example 15C, on the fifth line, change XY to X:

$$4.5 < X < 6Y = 50$$

[8/15/2019] On page 197, in exercise 14.10(D), change "All by III" to "All but III".

[8/13/2019] On page 184, in the solution to exercise 13.4, replace the last sentence with

Thus the systematic component for males is the systematic component for females minus $-1.200 + 0.012(60) = -0.48$, and the ratio we want is $e^{0.48} = \boxed{\mathbf{1.6161}}$.

[8/13/2019] On page 222, in formula (16.5), insert a 2 before the fraction:

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

[8/8/2019] On page 154, in the second displayed equation, change the second to last denominator from $1 + e^{-\eta_i}$ to $1 + e^{\eta_i}$.

[8/6/2019] On page 135, 5 lines from the bottom, change X_i to x_i.

[8/6/2019] On page 139, in exercise 11.8, in the table, change $\hat{\beta}$ for the intercept from -2.633 to -2.663.

[8/2/2019] On page 90, in the solution to exercise 6.6 statement II, on the first line, change "the higher the variance" to "the lower the variance".

[8/2/2019] On page 91, in the second bullet, on the second to third lines, change "cannot decrease the RSS and will almost surely increase it" to "cannot increase the RSS and will almost surely decrease it".

[8/1/2019] On page 119, in the solution to exercise 8.16(2), change "the latter" to "partial least squares".

[7/17/2019] On page 47, in the solution to exercise 3.26, on the fifth line, change s_{b_1} to s_{b_0}.

[5/16/2019] On page 236, on the third line, change x_{20} to p_{20}.

[5/9/2019] On page 384, replace the solution to question 25 with

First we have to back out the loglikelihood of the model. Using equation (14.15),

$$R^2 = (\text{max-scaled } R^2)(1 - \exp(l_0/n)^2) = 0.80(1 - (e^{-0.4588})^2) = 0.480419$$

Then using equation (14.14),

$$\begin{aligned} 1 - R^2 &= \left(\frac{\exp(l_0/n)}{\exp(l(\mathbf{b})/n)}\right)^2 \\ \sqrt{1 - 0.480419} &= \frac{e^{-0.4588}}{e^{l(\mathbf{b})/100}} \\ e^{l(\mathbf{b})/100} &= \frac{0.632042}{0.720820} = 0.876837 \\ l(\mathbf{b}) &= 100 \ln 0.876837 = -13.1434 \end{aligned}$$

The AIC penalty is 2 times the number of parameters. The AIC is

$$\text{AIC} = -2l + 2p = -2(-13.1434) + 2(3) = \boxed{\mathbf{32.29}}$$

None of the answer choices is correct.

[5/8/2019] On page 235, in the paragraph before Section 17.2, on the first line, change "minimizes" to "maximizes". On the third line, change "minimize" to "maximize".

[5/8/2019] On page 378, in the solution to question 27, replace the last line with

$$\frac{3.1371}{\sqrt{3.1371^2 + 28 - (2+1)}} = \boxed{\mathbf{0.5315}}$$

None of the answer choices is correct.

[5/3/2019] On page 185, replace the solution to exercise 13.12 with

The systematic component is

$$1.5 + 0.4(0.5) + 0.2(0.7) = 1.84$$

The Poisson mean is $e^{1.84} = 6.296538$. We multiply the Poisson probabilities by

$$\frac{1-\pi_0}{1-e^{-\mu_i}} = \frac{1-0.25}{1-e^{-6.296538}} = 0.751385$$

The probability of 2 is

$$\Pr(y_i = 2) = \frac{1-\pi_0}{1-e^{-\mu_i}} e^{-\mu_i} \frac{\mu_i^2}{2} = 0.751385 e^{-6.296538} \frac{6.296538^2}{2} = \boxed{\mathbf{0.027446}}$$

[4/23/2019] On page 82, in the solution to exercise 5.19, replace 1.1080, 34.6021, and 3.5600 with 1.0526, 5.8824, and 1.8868 respectively.

[4/22/2019] On page 145, in exercise 11.19, on the second line of (i), change $S(y,\theta)$ to $S(y,\phi)$. In (ii), change $a(\theta)$ to $b(\theta)$.

[4/22/2019] On page 226, in Table 16.2, on the line for k-fold CV, reverse the two arrows; bias should have the down arrow, variance should have the up arrow.