

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

Practice Exam 5:27 and 6:25 are defective in that none of the answer choices is correct.

[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  $1 - (\exp(l_0/n))^2$ .

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

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

[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  $\beta_1$  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 **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

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

The VIF is

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

[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

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

[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

$$\varepsilon_i = \hat{y}_i - y_i = 78.75 - y_i - 0.75y_{i-1}$$

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

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

[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  $e^{0.48} = \boxed{1.6161}$ .

[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

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

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

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

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

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

[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.