Errata and updates for ASM Exam C/Exam 4 Manual (Seventeenth Edition Third Printing) sorted by date.

[5/25/2017] On page 143, on the second and third lines of the answer to Example 8G, change 1.174 to 1.1774.

[1/13/2017] On page 1112, in exercise 56.15, on the last line of the table, delete "Claims".

[1/5/2017] On page 149, in the heading of Table 82., change Meaaures to Measures.

[12/14/2016] On page 759, on the third line of Section 38.5, replace "Section 38.5" with "Section 35.5".

[12/8/2016] On page 63, on the second line of the answer to Example 4E, replace $1\mathrm{d}x$ with $1\,\mathrm{d}t$.

[11/24/2016] On pages 681–682, replace the solution to exercise 34.32 beginning with the third paragraph with the following:

If you aren't comfortable calculating the Erlang distribution function, an alternative method for calculating $\Pr(Z > 20)$, is to calculate it directly. Once again, $Z = X_1 + X_2$, where X_1 and X_2 are the two exponential observations. We want $\Pr(Z > 20)$. By the Law of Total Probability, conditioning on X_1,

$$\Pr(Z > 20) = \int_0^\infty \Pr(Z > 20 \mid X_1 = x_1) f_{X_1}(x_1)\mathrm{d}x_1 \qquad (*)$$

The integral's lower bound is 0 since Z cannot be less than 0. X_1 is exponential with mean 6, so

$$f_{X_1}(x_1) = \frac{e^{-x_1/6}}{6} \qquad x_1 \ge 0$$

$\Pr(Z > 20 \mid X_1 = x_1)$ is equal to 1 if $X_1 \ge 20$, since $X_2 \ge 0$ and $Z = X_1 + X_2$. If $X_1 < 20$, then $Z > 20$ only if $X_2 \ge 20 - X_1$. Since X_2 is exponential with mean 6,

$$\Pr(X_2 \ge 20 - x_1) = e^{-(20-x_1)/6}$$

We can now rewrite equation (*) as follows:

$$\begin{aligned}\Pr(Z > 20) &= \int_0^{20} \Pr(Z > 20 \mid X_1 = x_1) f_{X_1}(x_1)\mathrm{d}x_1 + \int_{20}^\infty \Pr(Z > 20 \mid X_1 = x_1) f_{X_1}(x_1)\mathrm{d}x_1 \\ &= \int_0^{20} e^{-(20-x_1)/6}\left(\frac{e^{-x_1/6}}{6}\right)\mathrm{d}x_1 + \int_{20}^\infty \frac{e^{-x_1/6}}{6}\,\mathrm{d}x_1\end{aligned}$$

Let's evaluate these two integrals.

$$\begin{aligned}\Pr(Z > 20) &= \int_0^{20} \frac{e^{-20/6}}{6}\,\mathrm{d}x_1 + e^{-20/6} \\ &= \frac{20}{6}e^{-20/6} + e^{-20/6} \\ &= \left(1 + \frac{20}{6}\right)e^{-20/6} \\ &= \frac{13}{3}e^{-10/3} = \boxed{\mathbf{0.154587}}\end{aligned}$$

[11/15/2016] On page 1430, in the solution to question 30, replace $\mathbf{E}[(X-10{,}000)_+] - \mathbf{E}[(X-500)_+]$ with $\mathbf{E}[(X-500)_+] - \mathbf{E}[(X-10{,}000)_+]$.

[11/13/2016] On page 445, in the solution to exercise 26.3, on the last line, change $\sqrt{0.1699}$ to $\sqrt{0.001699}$.

[10/30/2016] On page 114, in the solution to exercise 6.23, on the second line, replace disribution with distribution. On the last line, remove the extra equals sign before the final answer.

[9/30/2016] On page 94, in the solution to exercise 5.14, on the second line, change "between 21 and 25" to "between 20 and 25".

[8/28/2016] On page 30, $F_X(x)$ is not a legitimate distribution function. Replace the example with

Claim sizes X initially follow a distribution with distribution function:

$$F_X(x) = 1 - \frac{1}{e^{0.01x}(1+0.01x)} \qquad x > 0$$

Claim sizes are inflated by 50% uniformly.

Calculate the probability that a claim will be for 60 or less after inflation.

Replace the answer with

Let Y be the increased claim size. Then $Y = 1.5X$, so $\Pr(Y \le 60) = \Pr(X \le 60/1.5) = F_X(40)$.

$$F_X(40) = 1 - \frac{1}{1.4e^{0.4}} = \boxed{\mathbf{0.5212}}$$

[8/28/2016] On page 158, on the last line, replace 21.2847 with 21.2848.

[6/29/2016] On page 510, in the solution to exercise 28.9, two lines from the end, delete the extra right parenthesis from the numerator $e^{-3/12}$.

[6/15/2016] On page 410, in the solution to exercise 24.10, on the fourth line, change 48 to 49.

[6/15/2016] On page 1155, in the solution to exercise 58.16, on the second displayed line, change 6.52686×10^9 to 3.95616×10^9. On the next line, change 6.52686 to 3.95616. Change the last 4 lines of the solution to

$$\begin{aligned}\mathrm{Var}(X_3) &= \mathbf{E}[\mathrm{Var}(X_3 \mid I)] + \mathrm{Var}(\mathbf{E}[X_3 \mid I]) \\ &= 0.637070(15{,}187{,}500) + 0.362930(18{,}750{,}000) + (0.637070)(0.362930)(2500 - 2250)^2 \\ &= 16{,}494{,}889\end{aligned}$$

The standard deviation is $\boxed{\mathbf{4061}}$. **(A)**

None of the answer choices is correct.

[5/1/2016] On page 1159, on the third line of the third paragraph, replace "add $\frac{1}{2}$" with "subtract $\frac{1}{2}$".

[4/15/2016] On page 1063, replace the first displayed line with

$$\bar{X} = \frac{c_1 + c_2 + c_3}{(6/12) + (8/12) + (3/12)}$$

[4/11/2016] On page 1026, in the solution to exercise 51.37, on the third displayed line, replace EPV with VHM. On the fouth displayed line, replace VHM with EPV.

[3/28/2016] On page 1149, in exercise 58.16, ignore the answer choices. The correct answer is not one of the choices.

[3/7/2016] On page 771, in exercise 38.23, in the table, the sum for interval (0, 2,000] should be 38,065.

[3/2/2016] On page 664, 12 lines from the bottom, replace the displayed line with

$$\sum_{i=1}^{n}(\bar{x}-\mu')(2x_i-\mu'-\bar{x}) = (\bar{x}-\mu')(2n\bar{x}-n\mu'-n\bar{x}) = n(\bar{x}-\mu')^2$$

[2/20/2016] On pages 573–574, in the solution to exercise 31.28, on the second-to-last line of the page, the exponent γ should be $1/\gamma$. On the first line of page 574, there should be parentheses around the fraction $\frac{206}{0.8^{-1}-1}$.

[2/13/2016] On page 1099, on the fourth line, remove the **E** and the left and right brackets in the numerator of the fraction.

[2/8/2016] On page 630, in the solution to exercise 33.3, on the first line, change "1, 2, and 4" to "1, 3, and 4".

[2/6/2016] On page 1113, in exercise 56.18, in the table's fourth column first row, change $\bar{x}_j$ to $\bar{x}_i$.

[1/26/2016] On page 1518, in the solution to question 34, change m to $\hat{m}$ in the three places it appears in the solution.

[1/25/2016] On page 270, in the solution to exercise 15.19, on the second displayed line, change ≤ 0.9 to ≥ 0.9.

[1/25/2016] On page 787, in the paragraph before Section 39.1, on the first line, change "three" to "two". On the second-to-last line, change "fifth" to "fourth".

[1/25/2016] On page 1063, on the line after the first displayed equation, delete the left parenthesis.

[1/25/2016] On page 1342, question 11 is based on material in *Loss Models* that is not on the current syllabus. Replace the question with the following question:

You are given the following information for a group policyholder regarding actual aggregate losses and the variance of aggregate losses in each of 3 years:

	Average Losses Per Member	Number of Members
Year 1	10	4
Year 2	9	5
Year 3	11	10

An exposure unit is defined as a member-year. The expected process variance per unit is 20 and the variance of the hypothetical means per unit is 1.

The prior value of expected losses per member-year is 15.

Calculate the Bühlmann-Straub estimate of aggregate losses per member-year.

(A) 12.4 (B) 12.5 (C) 12.6 (D) 12.7 (E) 12.8

[1/25/2016] On page 1496, replace the solution to question 11 with the following solution to the revised question:

The total number of exposures is 4 + 5 + 10 = 19. The weighted observed mean is

$$\bar{X} = \frac{4(10)+5(9)+10(11)}{19} = 10.26316$$

The credibility factor is

$$Z = \frac{19}{19+20/1} = \frac{19}{39}$$

The Bühlmann-Straub estimate is

$$\frac{19}{39}(10.26316) + \frac{20}{39}(15) = \boxed{\mathbf{12.6923}} \qquad \textbf{(D)}$$

[1/20/2016] On pages 1491–1492, while the solution to question 33 is correct, the following solution may be clearer:

The likelihood of no deaths is $(1-q)^2$. The prior distribution is normal with density $f(q)$. The posterior density function is the likelihood times the prior density, divided by the integral of the likelihood times the prior density. In other words, the posterior density function is

$$\pi(q \mid N_1) = \frac{(1-q)^2 f(q)}{\int_{-\infty}^{\infty}(1-q)^2 f(q)\,\mathrm{d}q} = \frac{(1-q)^2 f(q)}{\mathbf{E}_Q[(1-Q)^2]}$$

where N_1 is the observed number of deaths in the first year. The mean of the posterior distribution is

$$\begin{aligned}\mathbf{E}[Q \mid N_1] &= \frac{\int_{-\infty}^{\infty} q(1-q)^2 f(q)\,\mathrm{d}q}{\mathbf{E}(1-Q)^2}\\ &= \frac{\mathbf{E}[Q(1-Q)^2]}{\mathbf{E}[(1-Q)^2]}\\ &= \frac{\mathbf{E}[(1-(1-Q))(1-Q)^2]}{\mathbf{E}[(1-Q)^2]}\\ &= \frac{\mathbf{E}[(1-Q)^2]-\mathbf{E}[(1-Q)^3]}{\mathbf{E}[(1-Q)^2]}\end{aligned}$$

$1-Q$ is normal with mean 0.995 and variance 0.000001. So

$$\begin{aligned}\mathbf{E}[1-Q] &= \mu = 0.995\\ \mathbf{E}[(1-Q)^2] &= \mu^2+\sigma^2 = 0.995^2 + 0.000001 = 0.990026\end{aligned}$$

To obtain $\mathbf{E}[(1-Q)^3]$, we'll use the fact that a normal distribution is symmetric, so that its third central moment is 0.

$$\mathbf{E}[((1-Q)-0.995)^3] = 0$$
$$\mathbf{E}[(1-Q)^3] - 3\,\mathbf{E}[(1-Q)^2](0.995) + 2(0.995)^3 = 0$$
$$\mathbf{E}[(1-Q)^3] = 3\,\mathbf{E}[(1-Q)^2](0.995) - 2(0.995)^3 = 3(0.990026)(0.995) - 2(0.995)^3 = 0.985078$$

The posterior expected value is

$$\frac{0.990026-0.985078}{0.990026} = \boxed{\mathbf{0.004998}} \qquad \textbf{(E)}$$

[1/17/2016] On page 470, on the last line of the answer to Example 27E, change the denominator 4 to 3.

[12/18/2015] On page 1411, in the solution to question 16, on the fourth line, remove the negative sign in front of $e^{-1000/\theta}$; change $u = -e^{-1000/\theta}$ to $u = e^{-1000/\theta}$.

[11/10/2015] On page 511, in the solution to exercise 28.14, in the table, for Policy 3, change the entry under "End of" from 12-1-2012 to 12-31-2012.

[11/1/2015] On page 229, in the solution to exercise 13.16, on the last line, change the denominator $e^{\lambda-1}$ to $e^{\lambda}-1$.

[5/29/2015] On page 1552, in the solution to question 19, on the fifth line, change $e^{-\ln 4}$ to $e^{\ln 4}$.