Errata for Second Edition, First Printing

page 68, line 12: "z=0.67" should be "z=0.44"

page 71: Equation (2.23) should read

$$B(R) = \theta - \sum_{x=0}^{R-1}[1 - G(x)]$$

page 74, line 8: μ should be θ

page 100: Equation (2.63) should read

$$\begin{aligned} B(R) &= \sum_{x=R}^{\infty}(x - R)p(x) \\ &= \theta - \sum_{x=0}^{R-1}[1 - G(x)] \\ &= \theta p(R) + (\theta - R)[1 - G(R)] \end{aligned}$$

page 105, problem 6: "demand of 30 per week" should be "demand of 60 per week"

page 105, problem 7: "costs $300 per sheet" should be "costs $150 per sheet"

page 106, problem 9: holding costs, h_t should be $1 per month instead of $10 per month

page 107, problem 11, line 8: "The net revenue from a notebook sale…" should read "The net profit from a notebook sale…"

page 107, problem 13: This problem should read as follows:

Jill, the office manager of a desktop publishing outfit, stocks replacement toner cartridges for laser printers. Demand for cartridges is approximately 30 per year and is quite variable (i.e., can be represented using the Poisson distribution). Cartridges cost $100 each and require three weeks to obtain from the vendor. Jill uses a (Q,r) approach to control stock levels."

page 147, Problem 9. The lead time for the gear (end item) should be 3 periods, for the pinion it should be two periods. There should be 100 pinions on hand.

Page 198, line -2: "CT = T_{approx}" should be "C_{approx}"

Page 211, Second Table: The heading "Minimum per Unit" should be "Minutes per Unit"

Page 211, Problem 6.2: The second sentence should read. "The highly automated line can run 300 hours per month and requires one operator per station while running."

page 236, Figure 7.11: The words "bottleneck" should be "nonbottleneck" in the legend, which should read:

TH(w): base case
TH(w): increased nonbottleneck rates
Thbest(w): base case
Thbest(w): increased nonbottleneck rates

page 244, line 8 (problem 1) Change the words, "line behaves according to the best case" to
" process times are deterministic (as in the "best case"). "

page 244, line 20 (problem 2) Change the words, "the lines behaves according to the worst case" to " all jobs are processed at a station before moving (as in the "worst case"). "

page 244, line 21 (problem 3) Change the words, "line behaves according to the practical worst case." to "process times are exponentially distributed (as in the "practical worst case"). "

page 245, line 1 (problem 5) The problem should read, "Over the past three months, the old line has averaged 315 parts per day,"

page 248, line 1: "Little's law (TH=CT/WIP)" should be "Little's law (TH=WIP/CT)"

page 256, lines 8-9: "Thus, both stations have a natural CV of $c_0=\sigma_0/t_0=3.35/15.0=0.05$." should be "Thus, both stations have a natural SCV of $c_0^2=(\sigma_0/t_0)^2=(3.35/15)^2=0.05$."

page 269, Footnote 10 should read: "This is because $\sum_{n=1}^{\infty} nu^{n-1}$ is the derivative of $\sum_{n=}^{\infty} u^n$, which we saw is equal to $1/(1-u)$. Since the derivative of the sum is the sum of the derivatives, $\sum_{n=1}^{\infty} nu^{n-1}$ is equal to the derivative of $1/(1-u)$, which is $1/(1-u)^2$. Notice that this is only valid as long as $u<1$, which was already required for the queue to be stable."

page 270, line 27: "exact for the G/G/1 queue" should be "exact for the M/G/1 queue".

page 277, line –4 (equation 8.41, first line) change

$$\text{WIP}_{\text{nb}} \approx r_a\left(\frac{c_a^2+c_e^2}{2}\right)\left(\frac{u}{1-u}\right)t_e + t_e$$

should be,

$$\text{WIP}_{\text{nb}} \approx r_a\left\{\left(\frac{c_a^2+c_e^2}{2}\right)\left(\frac{u}{1-u}\right)t_e + t_e\right\}$$

page 278, line 13, change,
However, for small buffers, WIP will be close to (but always less than) the size of the buffer (that is, b-1).
to
However, for small buffers, WIP will be close to (but always less than) the maximum in the system (that is, b).

page 278, Equation (8.44) should be

$$\text{WIP} < \min\{\text{WIP}_{\text{nb}}, b\}$$

page 278, Equation (8.45) should be

$$\text{CT} > \frac{\min\{\text{WIP}_{\text{nb}}, b\}}{\text{TH}}$$

Page 278, Equation (8.47) on page 278 should have a term r_e as

$$\text{TH} \approx \frac{c_a^2+c_e^2+2(b-1)}{2(c_a^2+c_e^2+b-1)}r_e$$

and not $\text{TH} \approx \dfrac{c_a^2+c_e^2+2(b-1)}{2(c_a^2+c_e^2+b-1)}$

Page 281, line 9: “$8,538.358” should be “$8,538,358”

Page 284, Problem 3: The words “one-half minutes” should be “1.5 minutes”.

Page 284, Problem 3, part c: The words, “using both machines A and B.” should be “for both machine A and machine B.”

page 284, problem 6, part c: change the word “battery” to “station”

Page 286, Problem 10, part d. Replace

ii. Compute an upper bound on the WIP in the system.

iii. Compute an approximate upper bound on the total cycle time.

iv. DELETE THIS PART.

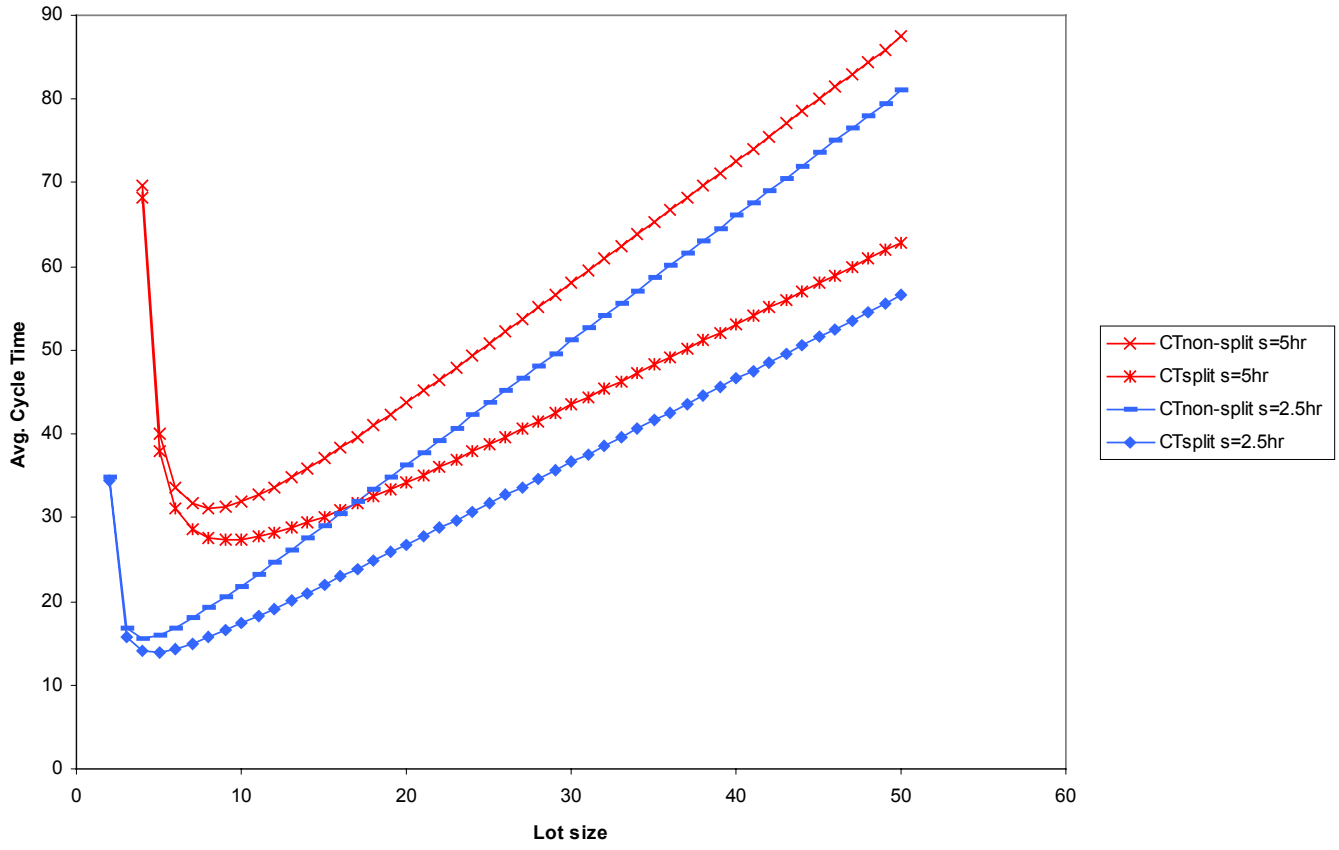
v. Part v becomes part iv. “Comment on reducing variability as a strategy.”

page 307, line 22: “With lot splitting, it is about 22 hours” should be “With lot splitting it is about 27 hours”. Note that the plot in Figure 9.5 for the case with lot splitting (CT_{split}, s = 5 hours) is also incorrect. The correct figure is below.

page 307, line –4: “and 11 hours with lot splitting” should be “and 14 hours with lot splitting”. Note that the plot in Figure 9.5 for the case with lot splitting (CT_{split}, s = 2.5 hours) is also incorrect. The correct figure is below.

page 307, line –3: “parts without lot splitting and five parts with lot splitting)” should be “parts for both the case without lot splitting and the case with lot splitting)”

page 307, Figure 9.5 Replace with:



page 336, problem 5, part c, the second sentence should be: "What is the average cycle time when the batch sizes are all equal to 1000 (assume $c_a^2 = 1$)?"

page 337, problem 9: Item A arrives at a rate of 10 per hour (not 30 per hour).

page 358, line 6: $63.30 should be $64.00

page 358, line 8: "5 percent" should be "6 percent"

page 364, problem 5 (b) i: "$c_e(1)=0.5$" should be "$c_e(1)=0.25$"
ii: "$c_e(3)=0.5$" should be "$c_e(3)=0.25$"

page 364, problem 5(c): "so that $t_e(2)=1.5$" should be "so that $t_e(2)=0.25$"

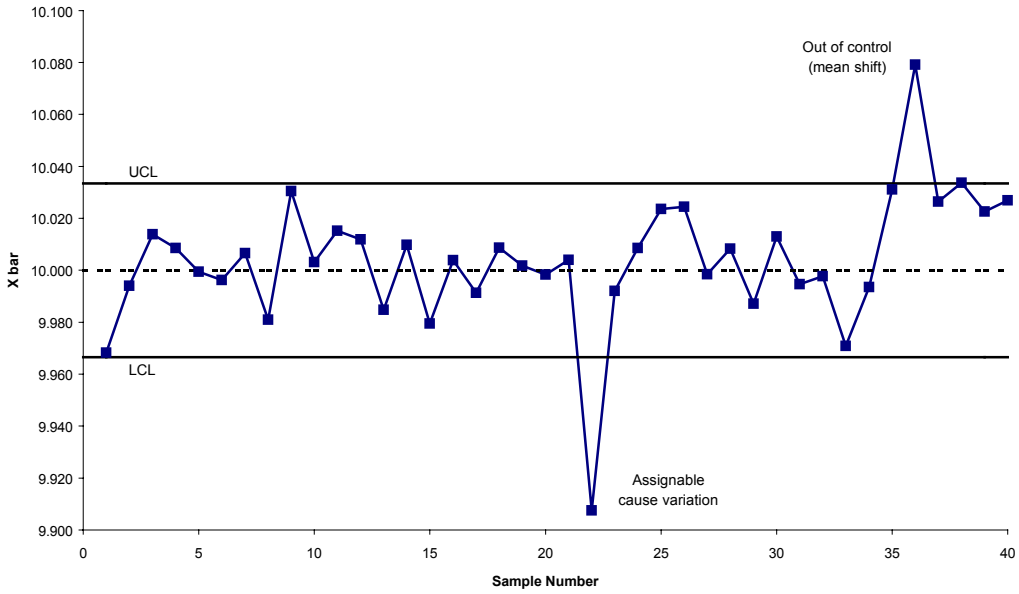
page 386, Equations (12.1) , (12.2), (12.3) should read

$$\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}} = \frac{0.025}{\sqrt{5}} = 0.01118 \qquad (12.1)$$

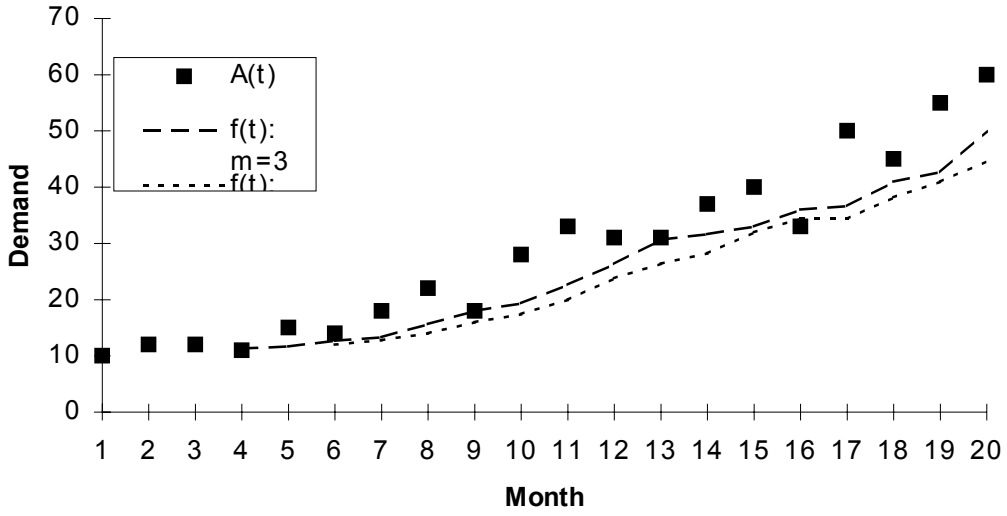
$$LCL = \mu - 3\sigma = 10 - 3(0.01118) = 9.96646 \qquad (12.2)$$

$$UCL = \mu + 3\sigma = 10 + 3(0.01118) = 10.03354 \qquad (12.3)$$

page 386, Figure 12.1: This figure plots error bars and outcomes for a sample size of n=1, instead of n=5 as cited in the example in the text below. The plot with n=5 should look like the following:



page 421, Figure 13.4 should show moving averages not exponential smoothing. The correct figure is:



page 425, Equation (13.13) should read

$$f(t+\tau) = [F(t) + \tau T(t)]c(t+\tau-N), \quad t+\tau = N+1,...,2N$$

page 426, line 2: "nonseasonal forecast" should be "nonseasonal forecast for period $t+\tau$"

page 426, line 2: "seasonality factor $c(t)$" should be "seasonality factor $c(t+\tau-N)$"

page 448, problem 2 (c): "predict the closing price for August 1, 2000?" should be "predict more accurately the closing price for August 1, 2000?"

page 479, equation 14.3. The second = sign should be a + sign so the equation should read:

$$\hat{\mu}(n) = \alpha Y_n + (1-\alpha)[\hat{\mu}(n-1) + \hat{T}(n-1)]$$

page 480, line 10: "$\lambda = 0.4$" should be "$\gamma = 0.4$"

page 486, problem 3: "Component 1 of type B jobs takes four and one-half hours to react the bottleneck" should be "Component 1 of type B jobs takes four and one-half hours to reach the bottleneck"

page 505, Equation 15.7, the d_j in the denominator should be r_{aj}.

page 506, line 13, "32 shop days" should be "43.7 shop days"

page 506, lines 26-28 should read
"Using these batch sizes results in an average cycle time of 33.1 days, a decrease of over 24 percent. Doing a complete search over all possible batch sizes shows that this is close to the optimal solution of 17, 17, 11 resulting in 32.6 days for average cycle time.

page 577, problem 6: "we will call X and Y" should be "we will call A and B". Also, in tables, all mentions to product X should be to product A and all mentions to product Y should be to product B.

page 636, line -3: "station (number 4) has the lowest utilization" should be "station (number 4) has the second lowest utilization"

page 677: The following references are missing

Kingman, J.F.C. 1961. “The Single Server Queue in Heavy Traffic.” *Proceedings of the Cambridge Philosophical Society* **57**: 902-4.

Medhi, J. 1991. *Stochastic Models in Queueing Theory*. Boston, MA: Academic Press.