

Exercise 2-7 Solution file from Kelton/Sadowski/Zupick, *Simulation With Arena*, 6th edition, McGraw-Hill, 2015

Here are the results from the original model (i.e., Table 2-4), followed by those from the new model, with the new summary measures in *italics*:

Original Model

Performance Measure	Replication					Sample		
	1	2	3	4	5	Average	Std. Dev.	Half Width
Total production	5	3	6	2	3	3.80	1.64	2.04
Average waiting time in queue	2.53	1.19	1.03	1.62	0.00	1.27	0.92	1.14
Average total time in system	6.44	5.10	4.16	6.71	4.26	5.33	1.19	1.48
Time-average no. parts in queue	0.79	6.63	0.36	0.16	0.05	1.60	2.83	3.51
Drill-press utilization	0.92	0.59	0.90	0.51	0.70	0.72	0.18	0.23

Double-Time Arrivals

Performance Measure	Replication					Sample		
	1	2	3	4	5	Average	Std. Dev.	Half Width
Total production	6	4	6	4	5	<i>5.00</i>	<i>1.00</i>	<i>1.24</i>
Average waiting time in queue	7.38	2.10	3.52	2.81	2.93	<i>3.75</i>	<i>2.09</i>	<i>2.60</i>
Average total time in system	10.19	5.61	5.90	6.93	5.57	<i>6.84</i>	<i>1.95</i>	<i>2.42</i>
Time-average no. parts in queue	2.88	0.52	1.71	0.77	2.25	<i>1.63</i>	<i>0.99</i>	<i>1.23</i>
Drill-press utilization	1.00	0.92	1.00	0.95	1.00	<i>0.97</i>	<i>0.04</i>	<i>0.05</i>

One not-quite-right, but still-reasonable, approach is to see if the original-model and changed-model confidence intervals for a given measure overlap or not—if they overlap we’re not getting a clear indication of a real difference. Taking a look at the above results, all five pairs of confidence intervals overlap, so while the averages *seem* to indicate higher production, congestion, and utilization, there is just too much uncertainty to conclude this firmly. There *is* a quite-right-indeed way to do this comparison, and Arena has a built-in way to help you do it (in the Output Analyzer); see Chapter 6.