Yet More Lightbulbs

$\overline{F}_x(3000) = e^{-3000/2000} \approx .223$

P(both lightbulbs work after 3000 hours) $= .223^2 = .0498$

The Non-Persistance of Memory

Since the exponential distribution is memoryless, bulb 1 has the same probability of surviving 3000 hours as a new bulb would have surviving 2000 hours. Similarly, the odds that the second bulb will make it to 3000 is the same as a new bulb making it to 500.

$$P = e^{-\frac{500}{2000}} \cdot e^{-\frac{2000}{3000}} = .2865$$

Check My Math

Throughput: $120 = \Lambda 1000 \quad \Lambda = \frac{12}{100}$ jobs/ms

By utilization law: $\frac{12}{100} \cdot 10 = U = 1.2$

You made a mistake because utilization cannot be greater than 1.

Unbalanced Server loads

$.6 = \lambda 250$ $\qquad$ $.8 = \frac{4.5}{1250}\,\bar{s}$

$\lambda = \frac{3}{1250}$ $\qquad$ $\bar{s} = 222.22$

arrival time	service_time	enter_service_time	departure_time	residual time
1	3	1	4	3
3	2	4	6	3
5	4	6	10	5
7	1	10	11	4
8	1	11	12	4
13	2	13	15	2
14	1	15	16	2
17	3	17	20	3