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Yet more light bulbs

Want to know,  $P(X > 3000)$ , use exponential CCDF

find parameter,  $\lambda$

$$\lambda = 1/2000 \quad x = 3000$$

$$F_x(3000) = e^{-(1/2000)3000} = .2231$$

two independent trials

multiply their probability

$$.2231 \times .2231 = \boxed{.04978}$$

Non-Persistence of Memory

Trying to find  ~~$P(X > 3000)$~~   $P(X > 1000 + 2000 | X > 1000)$

$P(X > 2500 + 500 | X > 2500)$

Memory-less property tells us  
for an exponential distribution  
the probability of  $X$  being  
~~longer~~ future

behavior is independent from past behavior

so you can treat future behavior as a new independent trial

$$\lambda = 1/2000$$

$$P(X > 2000) = e^{-1} = .367$$

$$P(X > 500) = e^{-500/2000} = e^{-1/4} = .7788$$

$$\text{multiply them} = \boxed{.286}$$