

**Recitation 18**  
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1. (Example 5.15) **Competing Exponentials.** Two light bulbs have independent and exponentially distributed lifetimes  $T_a$  and  $T_b$ , with parameters  $\lambda_a$  and  $\lambda_b$ , respectively. What is the distribution of  $Z = \min\{T_a, T_b\}$ , the first time when a bulb burns out ?
2. (Example 5.16) **More on Competing Exponentials.** Three light bulbs have independent exponentially distributed lifetimes with a common parameter  $\lambda$ . What is the expected value of the time until the last bulb burns out ?
3. (Problem 5.17a) Let  $X_1$  and  $X_2$  be independent and exponentially distributed, with parameters  $\lambda_1$  and  $\lambda_2$ , respectively. Find the expected value of  $\max\{X_1, X_2\}$  .
4. (Problem 5.21) **The number of Poisson arrivals during an exponentially distributed interval.** Consider a Poisson process with parameter  $\lambda$ , and an independent random variable  $T$ , which is exponential with parameter  $\nu$ . Find the PMF of the number of Poisson arrivals during the time interval  $[0, T]$ .