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 $[0, T]$.