3. Exercise: The sum of Poisson r.v.'s

Exercise: The sum of Poisson r.v.'s

1/1 point (graded)

Consider a Poisson process with rate $\lambda = 1$. Consider three times that satisfy $0 < t_1 < t_2 < t_3$. Let M be the number of arrivals during the interval $[0, t_2]$. Let N be the number of arrivals during the interval $[t_1, t_3]$. Is the random variable $M + N$ guaranteed to be Poisson?

No ▾ ✔ **Answer:** No

Solution:

Because the two time intervals overlap, M and N are not independent and the result in the preceding video does not apply. Consider the extreme case where $t_1 \approx 0$ and $t_2 \approx t_3$. In that case, the two intervals almost coincide, and therefore $M = N$ with high probability. In that case, the PMF of $M + N$ is concentrated on the even integers, which cannot happen for a Poisson PMF.

提交 你已经尝试了1次（总共可以尝试1次）

Answers are displayed within the problem

讨论

主题： Unit 9 / Lec. 23 / 3. Exercise: The sum of Poisson r.v.'s

显示讨论