Probability and Statistics January Exam 2024

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1 Question One

Assume the number of buses passing through a certain stop in 1 hour follows a Poisson distribution with average $\lambda = 5.5$. Calculate the probability that at least one bus turns up in 1 hour.

Answer: Recall that the Poisson distribution is (?). ✗

Real Answer: the Poisson distribution given $\bar{x} = \mu = \mathbb{E}(X) = \lambda$, and the $\mathbb{P}(X = k)$ is given by

$$\frac{\lambda^k e^{-\lambda}}{k!}.$$

One should consider the fact that the events are assumed to be independent. In light of this, given $\lambda = 5.5$ and $\mathbb{P}(X \leq 1) = \mathbb{P}(X = 1) + \mathbb{P}(X = 0)$, we get,