

Lab 4: Exploring the Poisson Probability Distribution

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Poisson Distributions

Functions: `dpois()`, `ppois()`, `qpois()`, `rpois()`

You run a computer server that services a local message board. Records indicate that messages arrive to the server at a rate of 6 per hour.

For each question below, write the code, then the text answer.

1. What is the expected value of this distribution? What is the variance?

In this question, $\lambda = 6/\text{hour}$. And the expected value will be $E(x) = \lambda = 6$ per hour.

$\text{Var}(X) = \lambda = 6$ per hour².

2. What is the probability that, in the next hour, the server will receive exactly 5 messages?

```
dpois(x=5,6)
```

```
## [1] 0.1606231
```

$P(X=5) = 0.16$

3. What is the probability that the server will receive no more than 10 messages but at least 5 messages in the next 2 hours?
4. What is the probability that, in the next 3 hours, the server will receive exactly 10 messages?
5. One of your friends says that there is only a 13% chance that the server will receive more than 8 messages in an hour. Are they correct? Why?