

Homework_1

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Problem 1

In class we discussed the Binomial distribution. Another discrete distribution is the Poisson distribution.

- a.) Look online and in your book collection to read about the Poisson distribution. Is $f(y|\lambda)$ a pdf or pmf? - pmf
- b.) What is the expected value $E(y)$? Prove it. - see attached pdf
- c.) What is the variance $\text{var}(y)$? Prove it. - see attached pdf
- d.) The number of mistakes a letter stuffing robot makes in an hour can be considered to be a Poisson random variable. Let the random variable Y have a Poisson distribution with parameter $\lambda=2.3$.

- What is the probability that the robot makes 2 mistakes in an hour?

```
dpois(2, lambda = 2.3)
```

```
## [1] 0.2651846
```

- What is the probability the robot makes at least 2 mistakes in an hour?

```
1 - sum(dpois(0:2, lambda = 2.3))
```

```
## [1] 0.4039612
```

- What is the the probability that the robot makes 2.3 mistakes in an hour?
- What is the probability that the robot makes 0 mistakes in an hour?
- What is the probability that the robot makes less than 6 mistakes in an hour?