Probability distributions: Takeaways ⤴

Syntax

- Using the probability mass function from SciPy:

  ```
  from scipy import linspace

  from scipy.stats import binom

  outcome_counts = linspace(0,30,31)

  dist = binom.pmf(outcome_counts,30,0.39)
  ```

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  ```

- Getting the summ of all the probabilities to the left of , including :

  ```
  left = binom.cdf(k,N,p)
  ```

- Getting the sum of all the probabilities to the right of :

  ```
  right = 1 - left
  ```

Concepts

- Binomial probabilities are the chance of a certain outcome happening in a sequence.
- One way to visualize binomials is a binomial distribution. Given   events, it plots the probabilities of getting different numbers of successful outcomes. The binomial distribution parameters are:

  - N : The total number of events.

  - p : The probability of the outcome we're interested in seeing.

- Formula for binomial probability: ⎯⎯⎯⎯

- The probability mass function (pmf) gives us the probability of each   occurring, and takes in the following parameters:

  - `x` : The list of outcomes.

  - `n` : The total number of events.

  - `p` : The probability of the outcome we're interested in seeing.

- A probability distribution can only tell us which values are likely, and how likely they are.

- We can calculate the expected probability of a probability distribution using   , where is the total number of events, and   is the probability of the outcome we're interested in seeing.

- The formula for standard deviation, or a measure of how much the values vary from the mean, of a probability distribution is   where   is the total number of events, is the probability of the outcome we're interested in seeing, and   is the probability of the outcome not happening.

- The cumulative density function is the probability that   or less events will occur.

- The z-score is the number if standard deviations away from the mean, and used to find the percentage of values to the left or right.

- We can calculate the mean ( ) and standard deviation ( ) using the following formulas:

  -

  -

- We can figure out the z-score of a value using the following formula:
  - z-score =

Resources

- [Probability Mass Function](#)
- [SciPy Documentation](#)
- [Documentation for scipy.stats.binom](#)
- [Cumulative Density Function](#)