
Lumache

Release 0.1

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SUMMARY

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Amazingo is a reliability Engineer and also study on Robotics Engineering This space is for writing technical document and blogs Check out the *Usage* section for further information, including how to *Installation* the project.

Note: This project is under active development.

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images/logo.png

1.1 Chi-squared test

The Chi-squared test is a statistical test for goodness of fit to determine whether we can accept or reject the hypothesis that the data is from the specified distribution at the specified level of significance. This method is not a means of comparing distributions (which can be done with AICc, BIC, and AD), but instead allows us to accept or reject a hypothesis that data come from a distribution. Note that the result is sensitive to the bins. For this reason, it is recommended to leave bins as the default value.

The procedure for the test involves comparing the fitted CDF (from a hypothesised distribution) against the empirical CDF (from a cumulative histogram of the data). As with all histograms, the exact shape of the histogram depends on the bins. The difference between the fitted CDF and the empirical CDF is used to find the chi-squared statistic. The specified level of significance (analogous to confidence level), the number of parameters in the hypothesised distribution, and the number of data points is used to obtain the chi-squared critical value from the chi-squared distribution. By comparing the chi-squared statistic with the chi-squared critical value, we can determine whether the hypothesis (that the data are from the specified distribution) should be rejected or accepted. The acceptance criteria is when the the chi-squared statistic is below the critical value.

API Reference

For inputs and outputs see the [API reference](#).

In the example below we import a dataset called mileage which contains 100 values that appear to be normally distributed. Using the function `chi2test` we can determine whether we should accept the hypothesis that the data are from a Normal distribution with parameters $\mu=30011$ and $\sigma=10472$. This example is based on Example 2.31 (page 63) of Reliability Engineering and Risk Analysis (listed in [recommended resources](#)).

```
from reliability.Datasets import mileage
from reliability.Distributions import Normal_Distribution
from reliability.Reliability_testing import chi2test
import numpy as np
```

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```
import matplotlib.pyplot as plt

data = mileage().failures
dist = Normal_Distribution(mu=30011, sigma=10472)
bins = [0, 13417, 18104, 22791, 27478, 32165, 36852, 41539, 46226, np.inf] #it is not
↳necessary to specify the bins and leaving them unspecified is usually best
chi2test(distribution=dist, data=data, bins=bins)
plt.show()

"""
Results from Chi-squared test:
Chi-squared statistic: 3.1294947845652
Chi-squared critical value: 12.591587243743977
At the 0.05 significance level, we can ACCEPT the hypothesis that the data comes from a
↳Normal Distribution (=30011,=10472)
"""
```



images/chi2test.png

1.2 Welcome to Lumache's documentation!

Lumache (/lu'make/) is a Python library for cooks and food lovers that creates recipes mixing random ingredients. It pulls data from the [Open Food Facts database](#) and offers a *simple* and *intuitive* API.

Check out the [Usage](#) section for further information, including how to [Installation](#) the project.

Note: This project is under active development.

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1.2.1 Usage

Installation

To use Lumache, first install it using pip:

```
(.venv) $ pip install lumache
```

Creating recipes

To retrieve a list of random ingredients, you can use the `lumache.get_random_ingredients()` function:

The `kind` parameter should be either "meat", "fish", or "veggies". Otherwise, `lumache.get_random_ingredients()` will raise an exception.

For example:

```
>>> import lumache
>>> lumache.get_random_ingredients()
['shells', 'gorgonzola', 'parsley']
```

1.2.2 API

read the doc gitbook