

Activity 12

The file `Cepheids_DATA_errMVerrP.csv` contains the data we have used in class for a sample of Cepheids variable stars. Specifically, the columns in the files are:

- MV: absolute magnitude in the V band
- MV_err: error on the absolute magnitude
- LogP: logarithm of the pulsations period
- LogP_err: error on the logarithm of the period

Using the software of your choice, visualize the data. Write a Bayesian linear regression model that neglects observational errors, and implement it in PyMC3. Analyze the results, and summarize your model with your best estimate for the parameters and their uncertainty.

Overplot your best-fit line with the 95% credibility region on the data.

You realize, by looking at the data, that your slope may be affected by the presence of a couple of outliers. Write a Bayesian Mixture model that account for the possibility that some of the observations are not generated by the same generative process.

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