Detailed Power Law Fitting Procedure

Find xmin, using minimum D: $D = \max_{x \geq x_{\min}} |S(x) - P(x)|$

(max distance between model CDF and observations CDF)

Find α using MLE formula: $\hat{\alpha} = 1 + n \left[\sum_{i=1}^{n} \ln \frac{x_i}{x_{\min}} \right]^{-1}$

Find p value:
Fraction of time K-S statistic of synthetic data > K-S of empirical data.

P > 0.1?

OK fit, **do not reject power law.**

P <= 0.1?

Bad fit,
reject power law
(Clauset says stop, but we want to find best fit function)

Use likelihood ratio test: (Appendix C)
in 'tournament' against other functional forms to find best fit.
(Using same xmin for all fits.)

Source: Clauset, Shalizi, Newman