Statastic Package Test with Larger Dataset

This document showcases the features of the `statastic` package using a larger dataset.

Data Preparation

We will use the following dataset:

```
(
  (1, 2.5),
  (2, 3.6),
  (3, 5.1),
  (4, 7.4),
  (5, 11.0),
  (6, 15.8),
  (7, 22.5),
  (8, 31.2),
  (9, 41.7),
  (10, 54.0),
  (11, 68.0),
  (12, 84.6),
  (13, 103.8),
  (14, 125.6),
  (15, 150.0),
)
```

The dataset contains two columns:

- Column 0: Independent variable `x`
- Column 1: Dependent variable `y`

Statistical Measures

Average

- Average of `x`: 8
- Average of `y`: 48.45333333333333

Median

- Median of `x`: 8
- Median of `y`: 31.2

Variance

- Variance of `x`: 20
- Variance of `y`: 2301.448380952381

Standard Deviation

- Standard Deviation of `x`: 4.47213595499958
- Standard Deviation of `y`: 47.973413271856955

Regression Analyses

We will perform different regression analyses on the dataset to find the relationship between `x` and `y`.

Linear Regression

- [**Slope**]: 10.119285714285715
- [**Intercept**]: −32.500952380952384

- [**R-squared**]: 0.8898739090986867

Quadratic Regression

The coefficients are:

- [**a**] (quadratic term): 0.9225113122171998
- [**b**] (linear term): −4.640895281189471
- [**c**] (constant term): 9.319560439560595
- [**R-squared**]: 0.9988354339858686

Exponential Regression

The coefficients are:

- [**a**]: 2.3306395927334793
- [**b**]: 0.29758977834783196
- [**R-squared**]: 0.8870596878369268

Logarithmic Regression

The coefficients are:

- [**a**]: −41.576598290036145
- [**b**]: 48.40445314040405
- [**R-squared**]: 0.6225192069601708

Power Regression

The coefficients are:

- [**a**]: 1.1517877579550115
- [**b**]: 1.6589388357918566
- [**R-squared**]: 0.8672937738030364

Conclusion

This test demonstrates the functionalities provided by the `statastic` package for statistical analysis and various regression models in Typst.