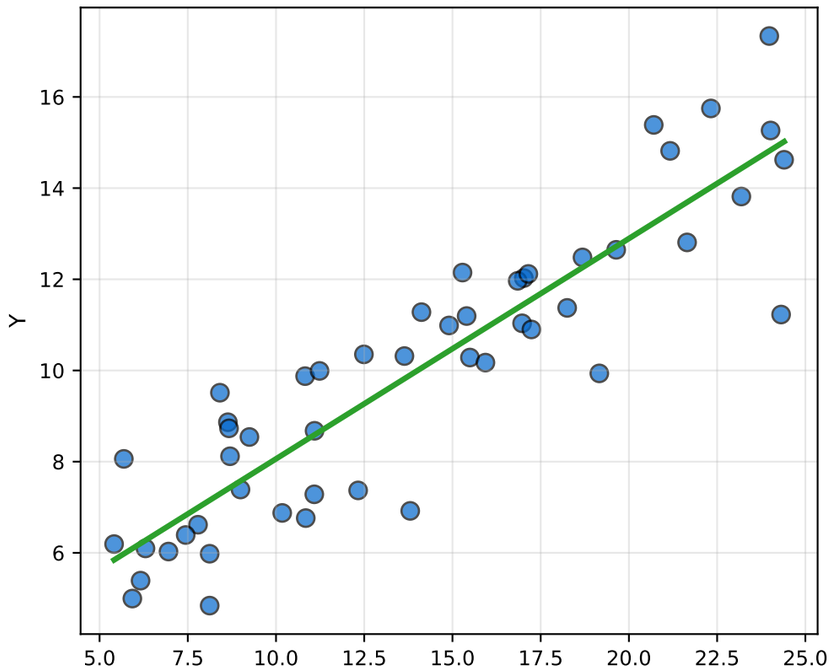
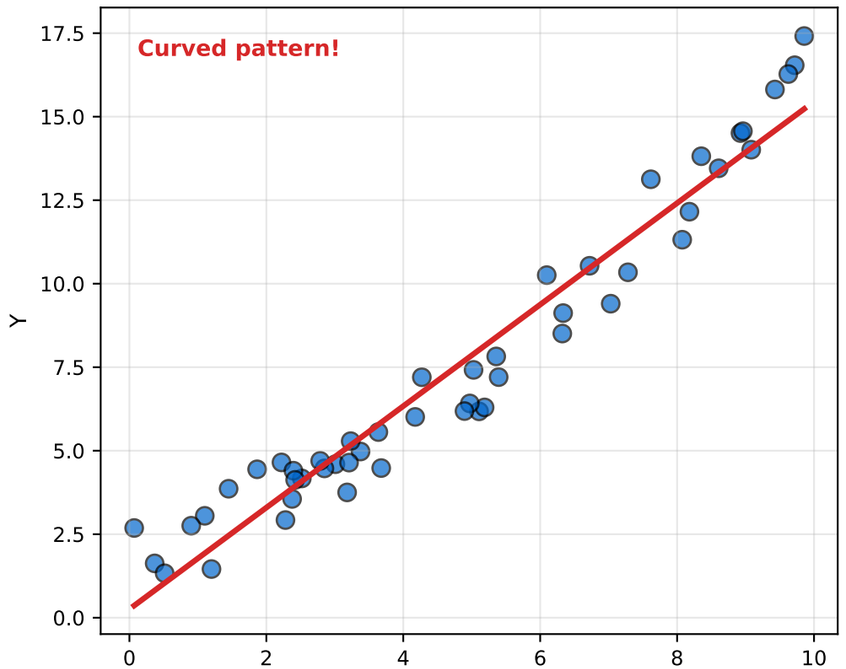
Linear Regression Assumptions: Checking Model Validity

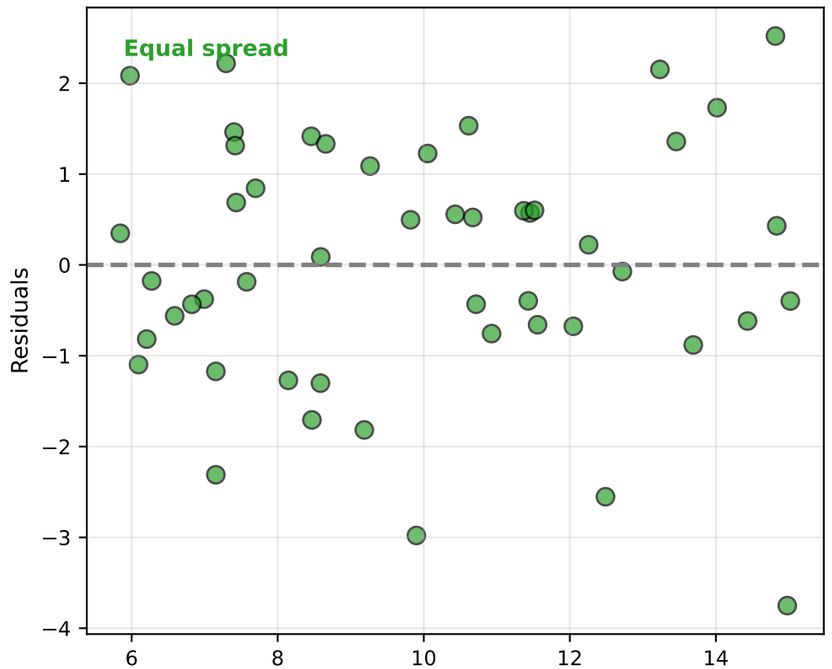
1. Linearity: GOOD



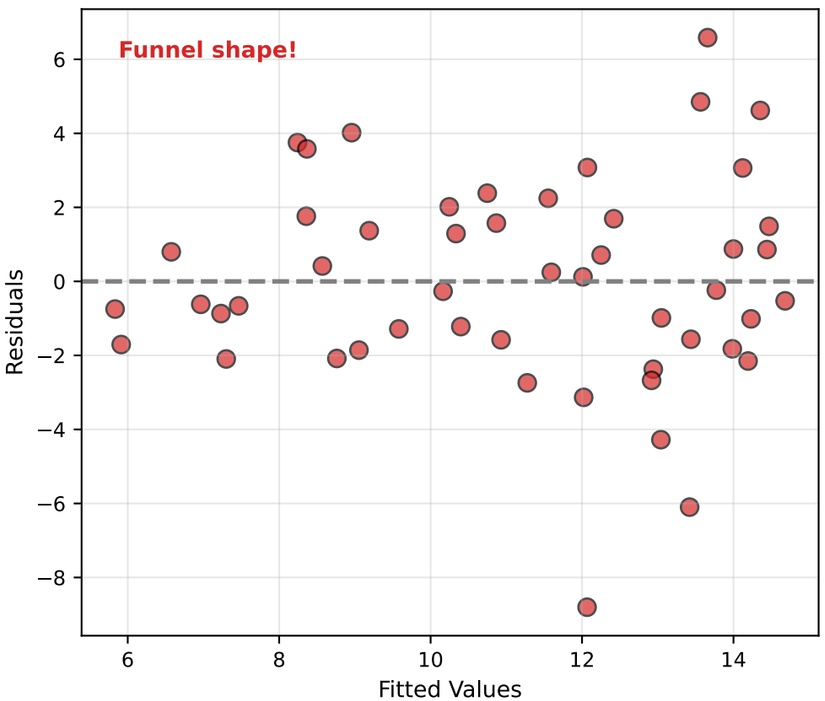
1. Linearity: VIOLATED



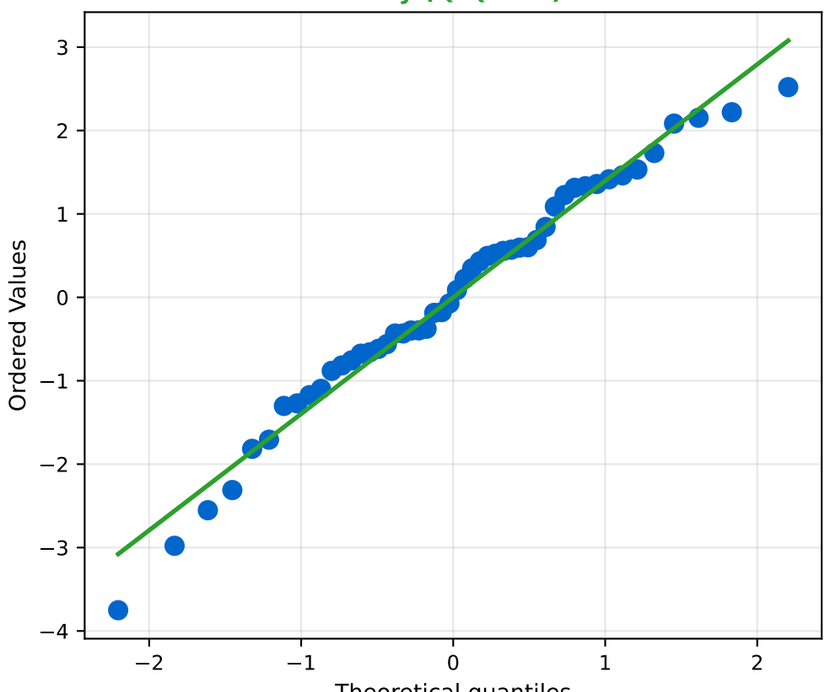
2. Constant Variance: GOOD



2. Constant Variance: VIOLATED



3. Normality (Q-Q Plot): GOOD



Assumptions Summary

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LINEAR REGRESSION ASSUMPTIONS

1. LINEARITY
   - Relationship between X and Y is linear
   - Check: Scatter plot, residuals vs fitted
   - Fix: Transform variables, use polynomial

2. HOMOSCEDASTICITY
   - Constant variance of residuals
   - Check: Residuals vs fitted plot
   - Fix: Log transform, weighted least squares

3. NORMALITY OF RESIDUALS
   - Residuals are normally distributed
   - Check: Histogram, Q-Q plot
   - Note: Less critical for large samples

4. INDEPENDENCE
   - Observations are independent
   - Check: Durbin-Watson test (time series)
   - Fix: Time series models if violated

5. NO MULTICOLLINEARITY (multiple regression)
   - Predictors not highly correlated
   - Check: VIF, correlation matrix
   - Fix: Remove or combine variables
```