Polynomial Regression

Polynomial curve fitting with Sci-kit learn

1. Use make regression to generate data
    a. (features = 5, output = 1, samples = 100)

2. Plot and analyze data

3. Generate polynomial features (terms) remember the equation

$$y(\mathbf{x}, \mathbf{w}) = w_0 + \sum_{i=1}^{D} w_i x_i + \sum_{i=1}^{D}\sum_{j=1}^{D} w_{ij} x_i x_j + \sum_{i=1}^{D}\sum_{j=1}^{D}\sum_{k=1}^{D} w_{ijk} x_i x_j x_k$$

Use "polynomialfeatures" function

4. Choose estimator (regression model)
    a. Linear least squares (use "Linearregression")
    b. Linear least squares with l2 regularization (use "Ridge")

5. Perform cross validation (5-fold)
    a. If you know how to build CV model then do it otherwise ridge with CV version is already available with Sci-kit learn

6. Plot all curves in same plot
7. Metrics
    a. Mean squared error regression loss
    b. Mean squared logarithmic error regression loss
    c. R^2 (coefficient of determination) regression score function.