Machine Learning for Actuaries

# Linear Regression Basics

**Pre-processing:**

<https://explore.udemy.com/data-science-linear-regression-in-python/>

<http://www.codingtricks.biz/generalized-linear-regression-python-scikit-learn-library/>

<https://medium.freecodecamp.org/data-science-with-python-8-ways-to-do-linear-regression-and-measure-their-speed-b5577d75f8b>

**Training:**

1. Fit a regression line using least squares
2. Single variable regression with SciKit Learn
3. Measuring the fit of a line, train/test split
4. Multiple variable regression
5. Adjusted R2, comparison of models

# Regularization

**Training:**

1. Variable selection
2. Ridge regression
3. LASSO
4. Cross validation for parameter tuning
5. Compare models

# Decision Trees & Random Forests

**Training:**

1. Single variable tree
2. Hyperparameter selection
3. Multiple variable tree
4. Random Forest
5. Boosting

# Principal Components Regression

<https://blogs.sas.com/content/iml/2017/10/25/principal-component-regression-drawbacks.html>  
ISLR <https://www.youtube.com/watch?v=eYxwWGJcOfw>

# Generalized Linear Models

# Generalized Additive Models

<https://codeburst.io/pygam-getting-started-with-generalized-additive-models-in-python-457df5b4705f>

# Non-Parametric Regression

<http://mccormickml.com/2014/02/26/kernel-regression/>  
<https://www.youtube.com/watch?v=ncF7ArjJFqM>

# Splines

<http://www.noahbrenowitz.com/post/regression-splines/>

ISLR 1 <https://www.youtube.com/watch?v=7ZIqzTNB8lk>

ISLR 2 <https://www.youtube.com/watch?v=mxXHJa1DsWQ>