# REGRESSION ALGORITHM

Lasso Regression(L1 Regularisation)

LASSO stands **for Least Absolute Shrinkage** and **Selection Operator.** It is frequently used in machine learning to reduce ovrtfitting and improve predictive performance.

It adds a penalty term (L1 norm) to loss function, this penalty is based on absolute values of coefficient.

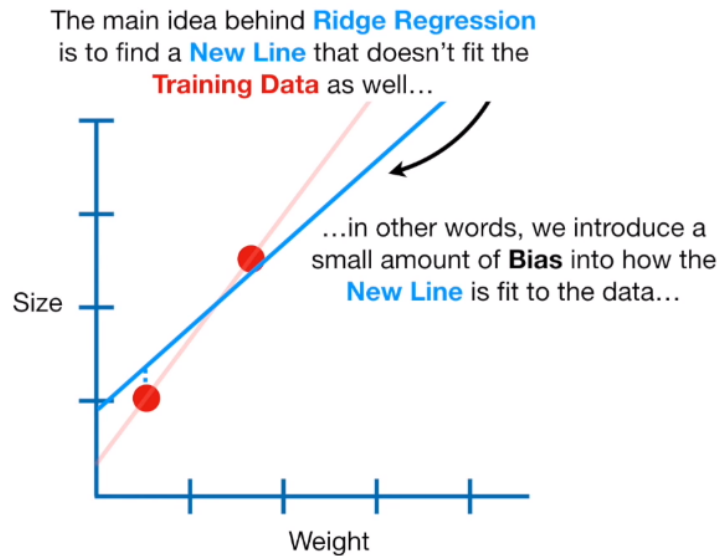**Penalty Function** is: lambda*|slope|.
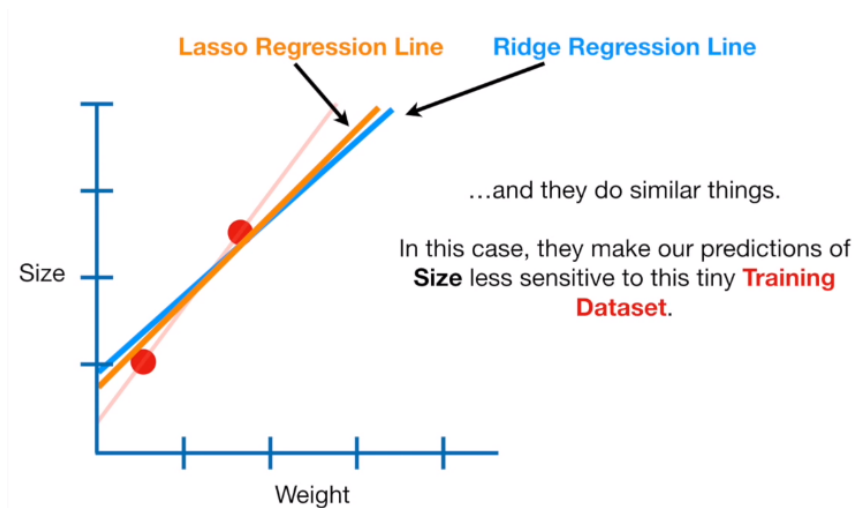

Ridge Regression (L2 Regularisation)

In multiple linear regression, ridge regression is used to handle multicollinearity that is high correlation between predictors. High Correlation Means strong relationship between two or more variable.

It adds a penalty term (L2 norm) to loss function, this penalty is proprotional to square of the magnitude of the coefficients(weights)

Penalty Function is: lambda*slope^2.

The main idea behind **Ridge Regression** is to find a **New Line** that doesn't fit the **Training Data** as well...

...in other words, we introduce a small amount of **Bias** into how the **New Line** is fit to the data...

Size

Weight

In other words, by starting with a slightly worse fit, **Ridge Regression** can provide better long term predictions.

Size

Weight
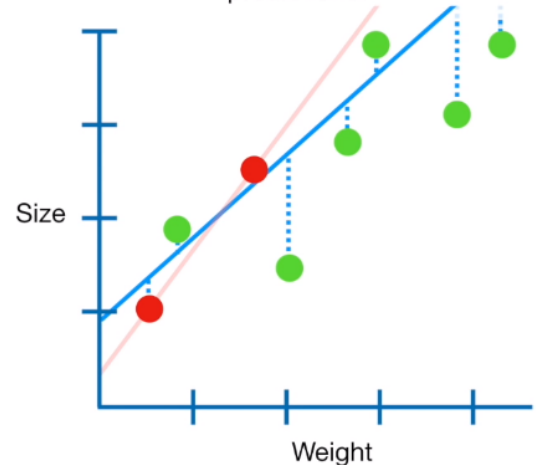
Quantile Regression

Quantile regression is used to estimate the quantiles of the response variable conditioned on the input.It is used in statistics and econometrics..

It provides a more flexible and powerful tool for analyzing the relationship between variables

Quantile regression on data with non-constant variance
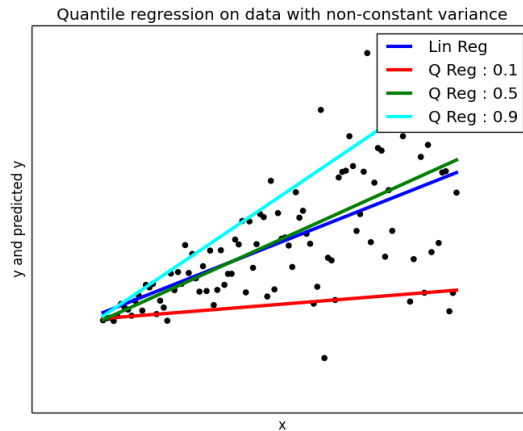
Poisson Regression

Poisson Regression is a statistical model used for analysing count data or event data.

The Poisson regression model specifies the probabilities that each dependent variable yi is drawn from a Poisson distribution with parameter λi, which is related to the independent variables xi.

lambda (λ) is the mean number of events within a given interval of time or space. For example, λ = 0.748 floods per year.