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Regression in Machine Learning

- Finds correlations between dependent and independent variables.
- Helps predict continuous variables like house prices, market trends, weather patterns, oil and gas prices.
- Finds mapping function to map input variable to output variable.

Regression Analysis in Machine Learning

- Fundamental concept in supervised learning.
- Algorithm trained with input features and output labels.
- Establishes variable relationships by estimating their impact.

Regression Metrics

- Variance:
  - Defines the change in the target function's estimate based on different training data.
  - The target function establishes the relationship between input and output variables.
  - To avoid false predictions, the variance should be low.
  - The model should be generalized to accept unseen features of temperature data.
- Bias:
  - Indicates the algorithm's tendency to consistently learn the wrong thing.
  - Low bias is necessary for model accuracy.
  - High bias can lead to incorrect predictions.
- Accuracy and Error:
  - Error is the difference between actual and predicted values.
  - Accuracy is the fraction of predictions the model correctly made.

Types of Regression

- Decision Tree Regression:
  - Divides dataset into smaller subsets for plotting data points.
- Principal Components Regression:
  - Widely used for multicollinear data.
- Polynomial Regression:
  - Fits non-linear equations using independent variable polynomial functions.
- Random Forest Regression:
  - Uses multiple decision trees to predict output.
- Simple Linear Regression:
  - The least complicated form with continuous dependent variable.
- Support Vector Regression:
  - Solves both linear and non-linear models using non-linear kernel functions.

GitHub Repository Link: [Real Estate Price Prediction Model](#)