

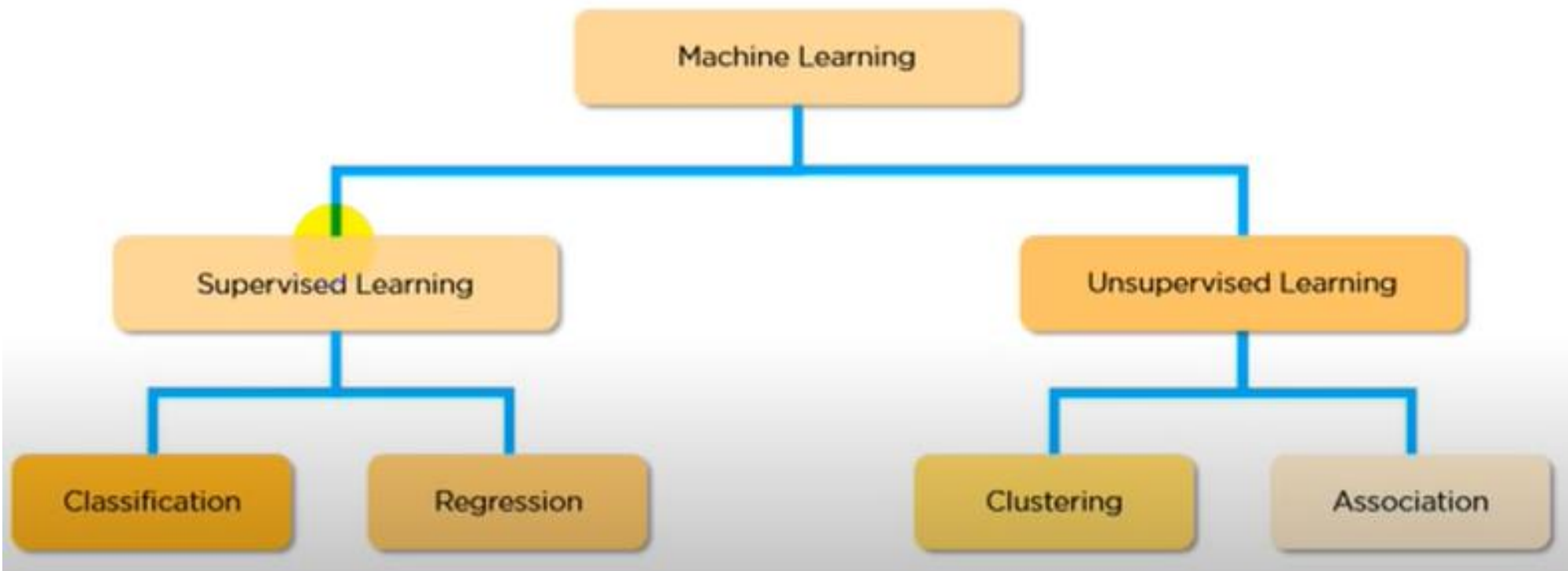
CS – Machine Learning

Overview

- Regression
- Types of Regression

Regression

Machine Learning



What is Regression?

Regression is a statistical and machine learning technique used to model the relationship between a dependent (target) variable and one or more independent (predictor) variables.

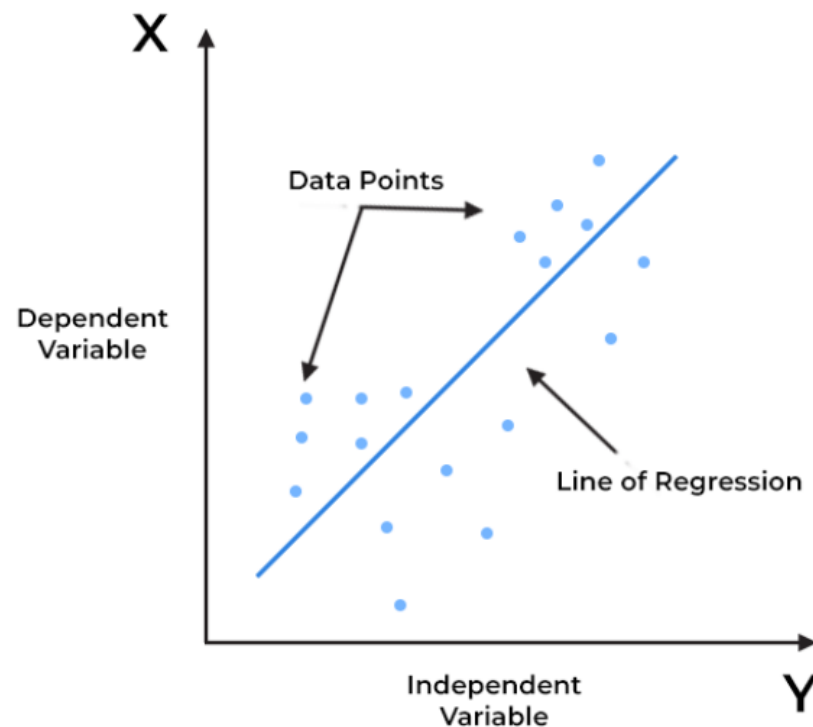
The goal of regression analysis is to predict or estimate the value of the dependent variable based on the values of the independent variables.

Types of Machine Learning Regression Models

- ☐ Simple Linear Regression
- ☐ Multiple Linear Regression
- ☐ Logistic Regression
- ☐ Polynomial Regression
- ☐ Support Vector for Regression
- ☐ Decision Tree Regression
- ☐ Random Forest Regression

1. Simple Linear Regression

Linear regression is a type of supervised machine learning algorithm that computes the linear relationship between the dependent variable and one or more independent features by fitting a linear equation to observed data.



2. Multiple Linear Regression

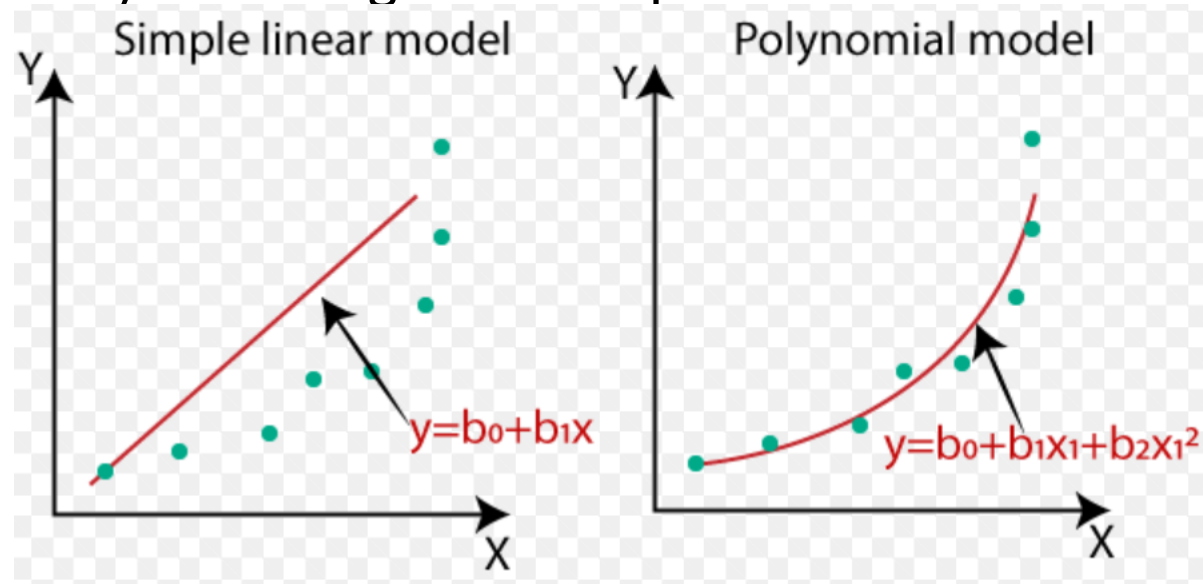
Multiple Linear Regression is an extension of simple linear regression where the model predicts the value of a dependent (target) variable based on more than one independent (predictor) variable. In other words, it examines the linear relationship between the dependent variable and multiple independent variables.

3. Logistic Regression

Logistic Regression is a type of regression analysis used for predicting the probability of a binary outcome, i.e., one that has two possible values (such as 0 and 1, yes and no, true and false). Instead of predicting a continuous value (as in linear regression), logistic regression models the probability that a given input belongs to a specific class.

4. Polynomial Regression

Polynomial Regression is a type of regression analysis used to model the relationship between the independent variable(s) and the dependent variable when the relationship is non-linear. Unlike linear regression, which fits a straight line to the data, polynomial regression fits a curve by including polynomial terms (i.e., powers of the independent variables) in the regression equation.



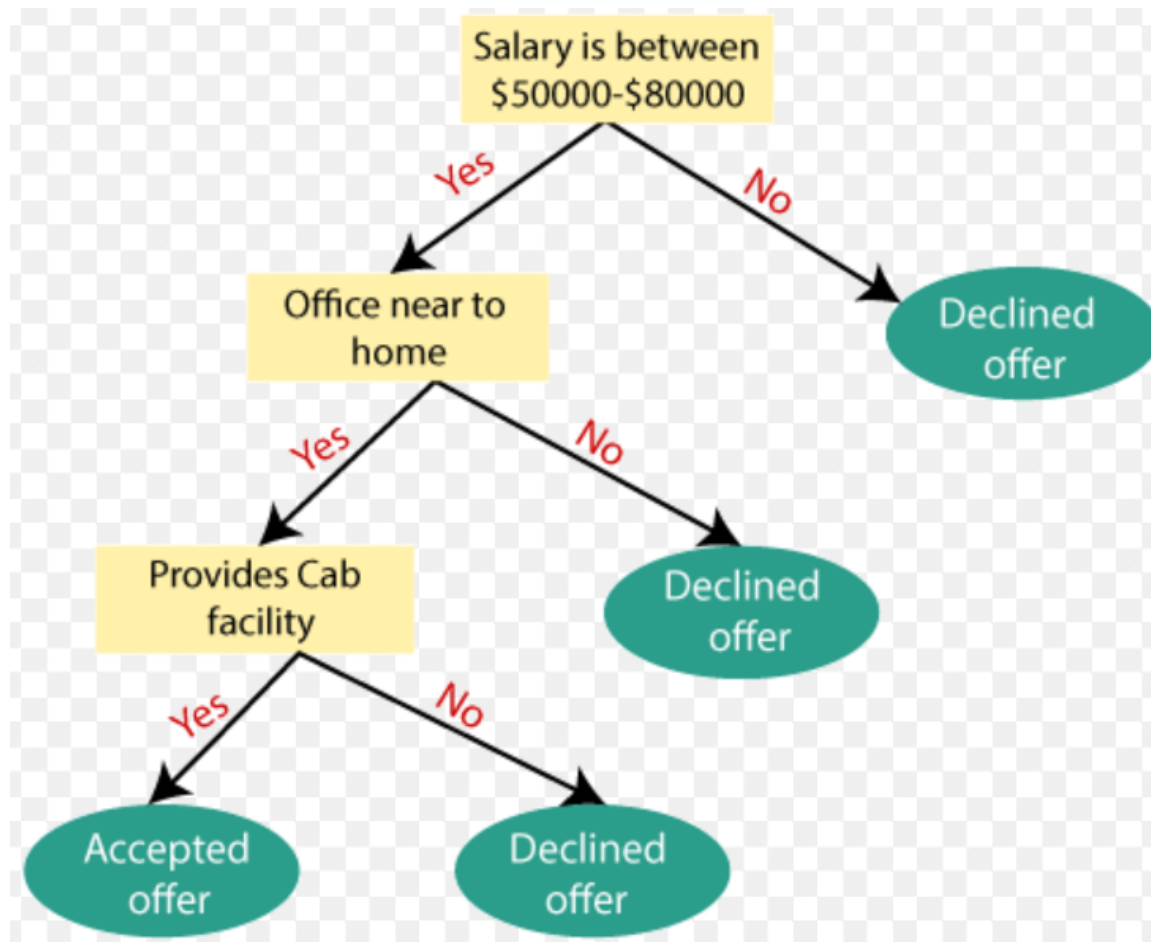
5. Support Vector for Regression

Support Vector Regression (SVR) is an extension of Support Vector Machines (SVM) used for regression tasks. While SVM is traditionally used for classification, SVR adapts the principles of SVM to predict continuous values (rather than discrete class labels) by fitting a function that approximates the data points within a certain tolerance.

6. Decision Tree Regression

Decision Tree Regression is a type of regression model that predicts continuous values by learning decision rules from data features. It works by recursively splitting the dataset into smaller subsets based on conditions on the input features, forming a tree-like structure where each node represents a decision (or split) and each leaf node represents a predicted outcome (continuous value).

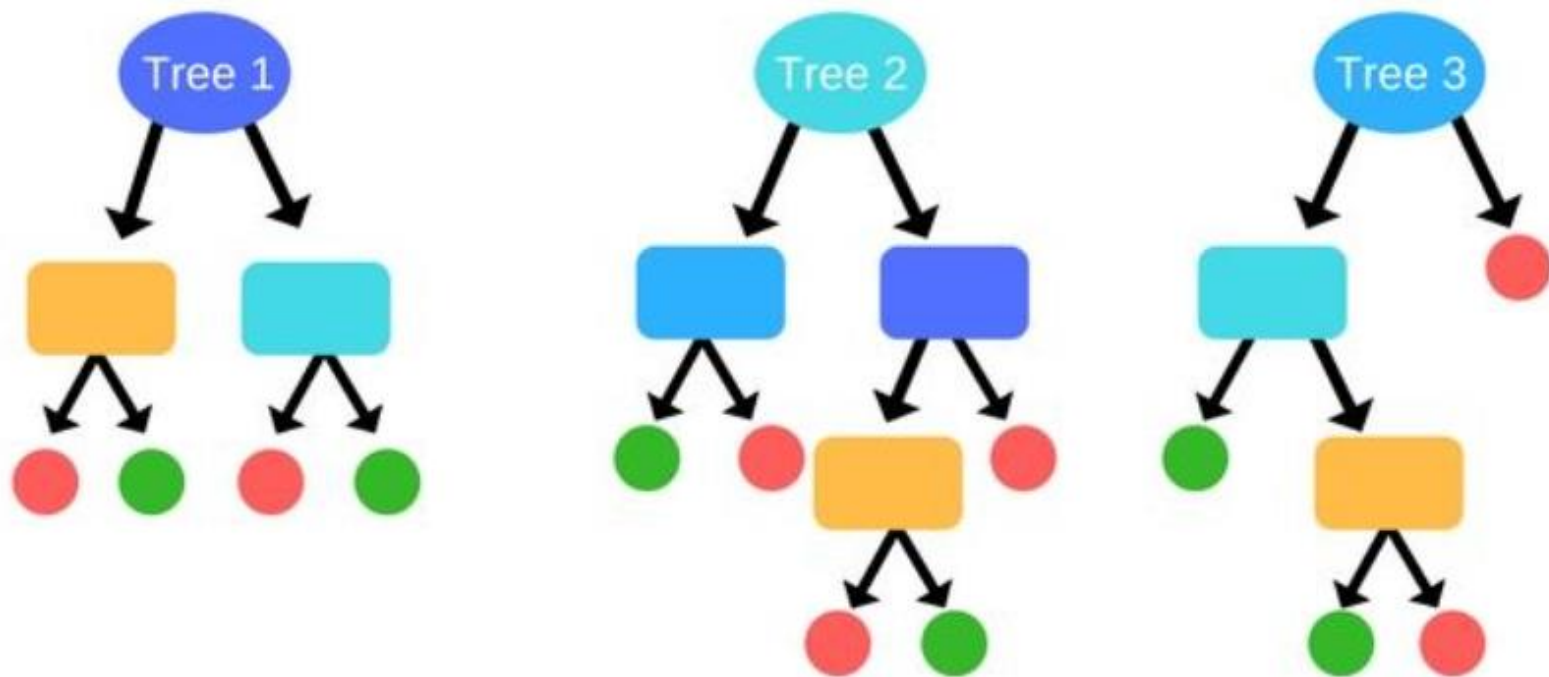
6. Decision Tree Regression



7. Random Forest Regression

Random Forest Regression is an ensemble learning method used for regression tasks. It operates by constructing multiple decision trees during training and outputting the average prediction of those trees. This approach is an improvement over single decision trees, as it reduces the risk of overfitting and increases accuracy and stability.

7. Random Forest Regression



Thank You