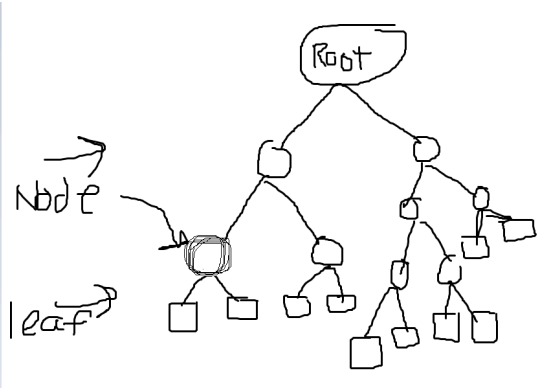
Classification:

- Classification is a type of supervised learning in machine learning where the task is to assign labels or categories to instances of data. For example, determining whether an email is spam or not spam is a classification problem. The key characteristics of classification include:
    - It works with labeled datasets where the outcome is known.
    - The aim is to predict discrete responses, like 'yes' or 'no', 'spam' or 'not spam', etc.
    - It is used in various applications like image recognition, speech recognition, and medical diagnosis.

Decision Tree Classification:

- Decision tree classification is a specific method used for classifying data. It involves breaking down a dataset into smaller subsets while developing an associated decision tree incrementally. Distinct features of decision tree classification include:
    - Contextual Decision Making: Decision trees use the features of objects to make decisions, which allows them to take context into account.
    - Sensitivity to Training Data: They are sensitive to slight changes in the training data, which can lead to different splitting and, consequently, different tree structures.
    - Overfitting: This is a common issue with decision trees. Overfitting occurs when the tree becomes too complex and starts to capture noise in the data rather than the actual pattern. This leads to poor performance on unseen data.
- Decision Tree Classification vs. Decision Tree Regression:
    - Classification Trees: These are used when the target variable is categorical. The tree splits the data into subsets based on the value of input variables, and the classification is made in the leaf node.
    - Regression Trees: Used when the target variable is continuous or quantitative. These trees predict a value (like a number) at the end, unlike classification trees that predict a class.



Naive Bayes:

- Naive Bayes is another classification technique based on Bayes' Theorem with the 'naive' assumption of conditional independence between every pair of features given the value of the class variable.
- Despite its simplicity, Naive Bayes can often outperform more sophisticated classification methods and is particularly known for its effectiveness in text categorization (such as spam filtering).

K-Nearest Neighbors:

- An algorithm in which it graphs data and predicts new data points by looking at its closest neighbors
- Good with small datasets
- Is computationally intensive