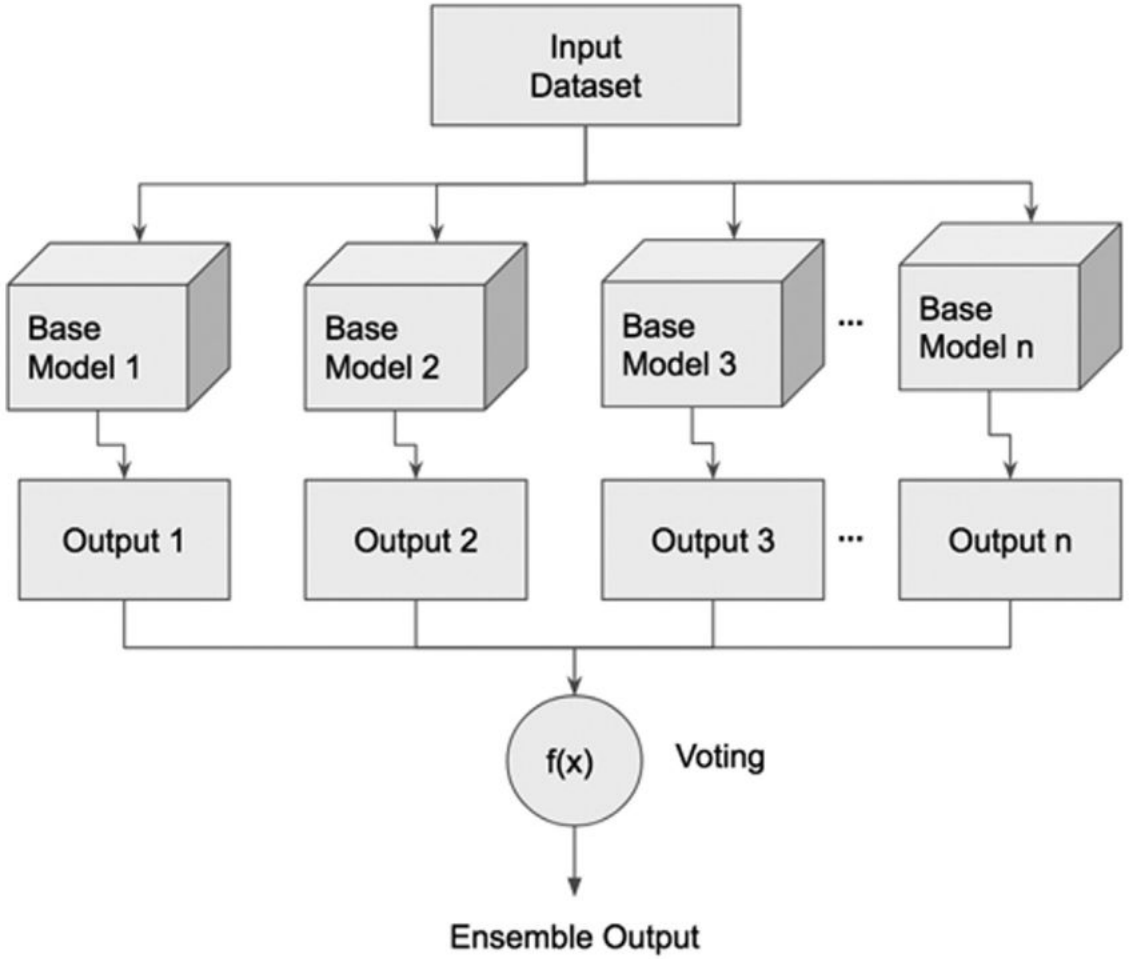
Machine Learning

Ensemble Learners

Ensemble Learning

- Ensemble learning is a machine learning technique that combines the predictions of multiple models (often called "weak learners") to create a stronger, more accurate prediction model.

Ensemble Learning



Conditions for Ensemble Modeling

- The most commonly used conditions are:
  - Different model algorithms: The same training set can be used to build different classifiers. The inherent characteristics of these models are different, which yield different error rates and a diverse base model set. For example, Stacking ensemble technique.
  - Parameters within the models: Changing the parameters with the same training set can be used to build all the base models. For example, Stacking ensemble technique.

Conditions for Ensemble Modeling

- Changing the training record set: Changing the training set to build the base model is one effective method for building multiple independent base models. For example, Bragging, Boosting ensemble techniques.
- Changing the attribute set: A sample of attributes is used for the building of each base model. This technique works if the training data have a large number of attributes. For example, Random Forest ensemble technique.

Benifits

- Ensemble learning can help
  - reduce overfitting
  - improve generalization
  - create more robust models

Limitations

- A main limitation of ensemble learning is its increased computational complexity and training time due to the need to train and combine multiple models, which can be a significant drawback in real-time or resource-constrained applications.