**Ensemble Learning**

Ensemble learning is a machine learning paradigm where multiple models (often called "weak learners") are trained to solve the same problem and combined to get better results. The main idea is that by combining the predictions of multiple models, the ensemble can achieve better performance and generalization than any single model.

There are several types of ensemble methods, including:

* **Bagging (Bootstrap Aggregating)**: This involves training multiple models on different subsets of the training data and averaging their predictions. Random Forest is a popular example.
* **Boosting**: This involves training models sequentially, where each model tries to correct the errors of the previous one. Examples include AdaBoost and Gradient Boosting.
* **Stacking**: This involves training multiple models and then using another model to combine their predictions.

**When to Use Ensemble Learning**

Ensemble learning is particularly useful in the following scenarios:

1. **High Variance Models**: When individual models are prone to overfitting, ensemble methods like bagging can help reduce variance.
2. **High Bias Models**: When individual models are too simple and underfit the data, boosting can help reduce bias.
3. **Complex Problems**: For problems where no single model performs well, combining multiple models can improve performance.
4. **Competitions**: In machine learning competitions, ensembles are often used to achieve the best possible performance.

Implementing code

**Kaggle Learn: "Ensemble Learning"**

<https://www.kaggle.com/code/pavansanagapati/ensemble-learning-techniques-tutorial>