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Week 6 Quiz

1. In machine learning, what is an ensemble method?

   An **ensemble method** in machine learning combines the predictions of multiple models (often of the same type) to improve accuracy and robustness. By aggregating results, **ensemble methods** reduce overfitting and variance compared to individual models.

2. Explain one of the two ways a random forest model uses randomness.

   By **randomly selecting subsets of feature**s for each tree during training, Random Forest uses randomness. This ensures that each tree focuses on different aspects of the data, improving generalization and reducing correlation between the trees.

3. Explain what the Python pickle module is used for.

   The **pickle** module in Python is **used for serializing and deserializing** Python objects, allowing them to be saved to a file and later loaded back. It is commonly used for saving trained machine learning models to reuse without retraining.

4. How are Random Forests better than Decision Trees (target a two sentence answer)?

   Random Forests are better than Decision Trees because they reduce overfitting by averaging multiple trees, leading to better generalization. They are also more robust, as the randomness introduced reduces the impact of noisy data.

5. What is one way that a Decision Tree is superior to a Random Forest?

   Decision Trees are superior in terms of **interpretability**, they are easier to visualize and understand since they involve a single decision-making process rather than a complex ensemble.