ORDINAL REGRESSION WITH A TABULAR WINE QUALITY MODELS TEAM PROJECT

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MY Role in Team

In my role, I played a crucial part in the project by focusing on optimizing the hyper parameters of the selected ordinal regression model for the tabular wine quality dataset. This task involved exploring various parameter configurations to find the optimal values that would enhance the model's performance according to the project's specific requirements. To achieve this, I employed cross-validation or grid search methodologies. These approaches allowed me to systematically evaluate a range of hyper parameter values, such as learning rates, regularization strengths, and the number of iterations. By carefully tuning these parameters, I aimed to improve the model's accuracy and generalization ability. Through my contribution, I helped ensure that the selected ordinal regression model was fine-tuned to its best possible configuration, maximizing its potential for accurately predicting wine quality in the given dataset.

FUNCTION

defines a function called Prune_model that takes two arguments: a grid of hyperparameters (grid) and a machine learning model (model). The function uses GridSearchCV, a method for hyperparameter tuning, to perform a grid search with cross-validation (cv = 3) and parallel processing (n_jobs = -1). It fits the model on the training data (X_train, y_train), prints the best parameters found during the search, and returns the fitted GridSearchCV object (gcv). Fig1: Shows the evidence of my work

```
def Prune_model(grid, model):
    gcv = GridSearchCV(estimator = model, param_grid = grid,cv = 3, n_jobs = -1)
    gcv.fit(X_train, y_train)
    print(gcv.best_params_)
    return gcv
```

Fig1: Shows Prune Model Function

GRID OF HYPERPARAMETERS

Grid of hyperparameters, including 'max_depth', 'min_samples_split', and 'min_samples_leaf', for the DecisionTreeClassifier model. It then uses the Prune_model function to perform a grid search with cross-validation on the provided grid and the DecisionTreeClassifier model. The scores obtained from the trained grid search model (ct_grid) on the training set (X_train, y_train) and testing set (X_test, y_test) are then printed, indicating the accuracy of the model on both sets.

```
grid = {'max_depth': range(1, 20),
        'min_samples_split': [2, 3, 4],
        'min_samples_leaf': range(1, 7)}

ct_model = DecisionTreeClassifier(random_state = 1234)
ct_grid = Prune_model(grid,ct_model)
ct_grid.score(X_train, y_train),ct_grid.score(X_test, y_test)
```

```
{'max_depth': 4, 'min_samples_leaf': 4, 'min_samples_split': 2}
(0.6111762407190309, 0.6046875)
```

Fig 2: Shows the Grid of Hyperparameters

Summary Teamwork

The significance of teamwork stems from its capacity to cultivate cooperation, amplify problem-solving capabilities, encourage the exchange of knowledge, and enable the pooling of resources and talents. By collaborating as a team, individuals can integrate their distinct viewpoints and proficiencies, resulting in more holistic and triumphant results. Moreover, teamwork fosters a constructive and encouraging work environment, where team members can acquire knowledge from one another and contribute towards a common objective. The experience of collaborating with a team can be gratifying and fulfilling, as it facilitates personal development and the attainment of shared goals.