Model Optimization and Tuning Phase Template

Date	21 June 2024
Team ID	739954
Project Title	Cereal analysis based on ratings by using mechine learning techniques
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining neural network models for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

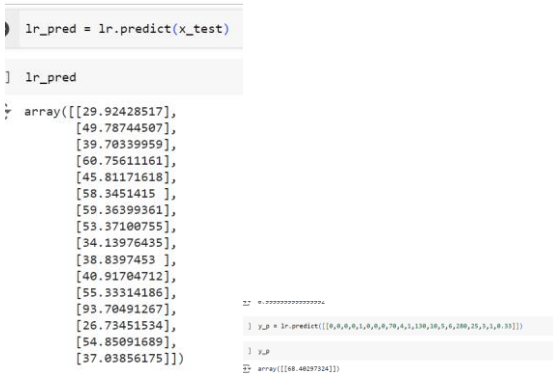
Hyperparameter Tuning Documentation (8 Marks):

Model	Tuned Hyperparameters

Linear Regression Model	**LINEAR REGRESSION MODEL**
	`from sklearn.linear_model import LinearRegression`
	`lr = LinearRegression()`
	`lr.fit(x_train,y_train)`
	`LinearRegression`
	`LinearRegression()`

R2_Score Model	**R2_SCORE MODEL**
	`from sklearn.metrics import r2_score`
	`r2_score(y_test,lr_pred)`
	`0.9999999999999992`

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Random Forest	Linear Regression model is chosen for its robustness in handling complex datasets and its ability to mitigate overfitting while providing high predictive accuracy.  Above all the models Linear Regression Model have the highest accuracy among all the models.

```
lr_pred = lr.predict(x_test)

lr_pred

array([[29.92428517],
       [49.78744507],
       [39.70339959],
       [60.75611161],
       [45.81171618],
       [58.3451415 ],
       [59.36399361],
       [53.37100755],
       [34.13976435],
       [38.8397453 ],
       [40.91704712],
       [55.33314186],
       [93.70491267],
       [26.73451534],
       [54.85091689],
       [37.03856175]])
```