Model Development Phase Template

Date	8 July2024
Team ID	SWTID1720104754
Project Title	Cereal Analysis Based On Rating By Using Machine Learning Techniques
Maximum Marks	6 Marks

Model Selection Report

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

Model Selection Report:

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
Random Forest	An ensemble model that combines multiple decision trees to improve prediction accuracy and reduce overfitting.	n_estimators, max_depth, min_samples_leaf	Model: Random Forest Regressor R-squared: 0.7841 Root Mean Squared Error (RMSE): 6.8870 Mean Absolute Percentage Error (MAPE): 16.9964%
Linear Regression	Predicts cereal ratings based on linear	Regularization parameter (alpha)	Model: Linear Regression R-squared: 1.0000 Root Mean Squared Error (RMSE): 0.0000 Mean Absolute Percentage Error (MAPE): 0.0000%

	relationship between features like nutritional content, consumer preferences, etc.		
Decision Tree	Builds a decision tree to predict ratings, handling non-linear relationships and feature interactions	Max depth, min samples split	Model: Lasso Regression R-squared: 1.0000 Root Mean Squared Error (RMSE): 0.0859 Mean Absolute Percentage Error (MAPE): 0.1717%
Ridge Regression	Ridge Regression is a technique used to analyze multiple regression data that suffer from multicollinearity. By adding a degree of bias to the regression estimates, Ridge Regression reduces the standard errors.	α (alpha)	Model: Ridge Regression R-squared: 0.9941 Root Mean Squared Error (RMSE): 1.1395 Mean Absolute Percentage Error (MAPE): 2.0762%
Lasso Regression	Lasso Regression is a regression analysis method that performs both variable selection and regularization to	α (alpha)	Model: Lasso Regression R-squared: 1.0000 Root Mean Squared Error (RMSE): 0.0859 Mean Absolute Percentage Error (MAPE): 0.1717%

	enhance the prediction accuracy and interpretability of the statistical model it produces.		