

Model Development Phase Template

Date	14 July 2024
Team ID	SWTID1720160264
Project Title	Predicting Compressive Strength Of Concrete Using Machine Learning
Maximum Marks	6 Marks

Model Selection Report

In the Model Selection Report, various models are outlined, detailing their descriptions, hyperparameters, and performance metrics(R2_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)
Linear Regression	Linear Regression is a foundational technique in machine learning, offering a straightforward way to model and understand relationships between variables.	—	R2_score = 71.4

Ridge and Lasso Regression	Ridge and Lasso Regression are extensions of linear regression that incorporate regularization, which helps to prevent overfitting by penalizing large coefficients.	—	R2_score for Ridge = 71.45 R2_score for Lasso = 71.36
Gradient Boosting Regression	Gradient Boosting Regression builds an additive model in a forward stage-wise fashion, allowing for the optimization of arbitrary differentiable loss functions.	Gridsearchcv and Randomizedsearchcv	R2_score for Gridsearchcv = 91.6 R2_score for Randomizedsearchcv = 94.3
XGBoost Regression	XGBoost Regression is a flexible tool for predictive modeling, offering high performance, scalability, and robustness. Ability to handle large datasets and efficient implementation.	Gridsearchcv and Randomizedsearchcv	R2_score for Gridsearchcv = 92.2 R2_score for Randomizedsearchcv = 94.08

Random Forest Regression	It is an ensemble learning method that uses multiple decision trees to improve predictive performance and control overfitting. It is based on the concept of bagging which involves training multiple models on different subsets of the training data	Gridsearchcv and Randomizedsearchcv	R2_score for Gridsearchcv = 90.88 R2_score for Randomizedsearchcv = 89.78
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