

## Model Development Phase Template

Date	11 July 2024
Team ID	SWTID1720174920
Project Title	Human Resource Management: Predicting Employee Promotions Using Machine Learning
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)
decision Tree	A Decision Tree is a supervised machine learning algorithm used for both classification and regression tasks. It works by splitting the data into subsets based on the value of input features, creating a tree-like model of decisions	criterion='entropy', max_depth=5, min_samples_split=10, min_samples_leaf=5,random_state=42	Accuracy Score=93.73%
randomForest	One of the important algorithms of ensemble learning is a Random Forest, which combines many decision trees aimed at	n_estimators=100, max_depth=5, random_state=42	Accuracy Score=94.94%

	enhancing the accuracy and robustness of predictions by reducing overfitting and increasing model generalization capacity. In this way, Random Forest achieves high accuracy beyond that by individual decision trees, hence its popularity for classification and regression tasks		
KNN	K-Nearest Neighbors (KNN) is a simple yet effective machine learning algorithm that predicts the output of a new instance by finding the most similar instances in the training data and voting on their labels, resulting in accurate	n_neighbors=3, weights='uniform',algorithm='auto',leaf_size=10	Accuracy Score=89.52%
xgboost	XGBoost is a highly efficient and flexible gradient boosting algorithm that excels in handling structured/tabular data. Its combination of speed, accuracy, and scalability has made it a go-to choice for many data scientists and machine learning practitioners.	n_estimators=100, learning_rate=0.1, max_depth=3, random_state=42	Accuracy Score=86.43%