

## Model Development Phase Template

Date	15 March 2024
Team ID	SWTID1720161281
Project Title	Ecommerce Shipping Prediction 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)
SVM	SVM classifier uses a line to classify between two classes	Kernel: -poly, rbf c: - 10,13 Gamma: -4,5	<pre> ---SVC--- 0.9719484457922669               precision    recall  f1-score   support       0       1.00        0.95        0.97        703      1       0.95        1.00        0.97        616   accuracy          0.97  macro avg         0.97  weighted avg      0.97 [[669 34]  [ 3 613]] </pre>
KNN	It uses clustering to classify	Algorithm: -auto, ball_tree, kd_tree p: -1,5,10	<pre> ---k nearest neighbors-- 0.9598180439727066               precision    recall  f1-score   support       0       1.00        0.93        0.96        719      1       0.92        0.99        0.96        600   accuracy          0.96  macro avg         0.96  weighted avg      0.96 [[669 50]  [ 3 597]] </pre>

Logistic Regression	Binary classification using sigmoid-based probability estimation.	None	<pre> ---Logistic regression--- 0.9423805913570887       precision    recall  f1-score   support       0       0.97       0.92       0.94       704      1       0.92       0.96       0.94       615   accuracy         0.94         0.94         0.94       1319  macro avg       0.94         0.94         0.94       1319  weighted avg    0.94         0.94         0.94       1319  [[650  54]  [ 22 593]] </pre>
Decision Tree	Hierarchical model for decision-based data classification	None	<pre> ---DecisionTreeClassifier-- 0.9727065959059894       precision    recall  f1-score   support       0       0.98       0.97       0.97       682      1       0.96       0.98       0.97       637   accuracy         0.97         0.97         0.97       1319  macro avg       0.97       0.97       0.97       1319  weighted avg    0.97       0.97       0.97       1319  [[659  23]  [ 13 624]] </pre>
Random Forest	Ensemble of decision trees for improved prediction	None	<pre> ---RandomForestClassifier-- 0.9787717968157695       precision    recall  f1-score   support       0       1.00       0.96       0.98       698      1       0.96       1.00       0.98       621   accuracy         0.98         0.98         0.98       1319  macro avg       0.98       0.98       0.98       1319  weighted avg    0.98       0.98       0.98       1319  [[671  27]  [  1 620]] </pre>
XG Boost	Gradient-boosted decision trees for enhanced performance	None	<pre> ---xgboost--- 0.979529946929492       precision    recall  f1-score   support       0       1.00       0.97       0.98       693      1       0.96       1.00       0.98       626   accuracy         0.98         0.98         0.98       1319  macro avg       0.98       0.98       0.98       1319  weighted avg    0.98       0.98       0.98       1319  [[669  24]  [  3 623]] </pre>
AdaBoost	Adaptive boosting of weak learners for accuracy	None	<pre> ---AdaBoost--- 0.9704321455648218       precision    recall  f1-score   support       0       0.98       0.96       0.97       689      1       0.96       0.98       0.97       630   accuracy         0.97         0.97         0.97       1319  macro avg       0.97       0.97       0.97       1319  weighted avg    0.97       0.97       0.97       1319  [[661  28]  [ 11 619]] </pre>
Gradient Boost	Boosted gradient-based models for superior accuracy.	None	<pre> ---gradient Boosting--- 0.978013646702047       precision    recall  f1-score   support       0       1.00       0.96       0.98       695      1       0.96       1.00       0.98       624   accuracy         0.98         0.98         0.98       1319  macro avg       0.98       0.98       0.98       1319  weighted avg    0.98       0.98       0.98       1319  [[669  26]  [  3 621]] </pre>

Naïve Bayes	Probability-based classifier assuming feature independence.	None	<pre> ---naive bayes-- 0.934799002198635       precision    recall  f1-score   support       0       0.95       0.92       0.94        690      1       0.92       0.95       0.93        629   accuracy          0.93          0.94          0.93       1319  macro avg          0.93          0.94          0.93       1319  weighted avg          0.94          0.93          0.93       1319  [[638  52]  [ 34 595]] </pre>
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