

## Model Development Phase Template

Date	5 May 2024
Team ID	737906
Project Title	Walmart Sales Analysis for Retail Industry with Machine Learning
Maximum Marks	4 Marks

### Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

#### Initial Model Training Code:

```

1 | 3 | 2 | 2010 | False
2 | 4 | 2 | 2010 | False

[ ] from sklearn.ensemble import RandomForestRegressor
rf = RandomForestRegressor(n_estimators=150, max_depth=30, min_samples_split=5, min_samples_leaf=5)
rf.fit(X_train, y_train.ravel())
print('Testing Accuracy:', rf.score(X_test, y_test.ravel())*100, '%')
y_pred = rf.predict(X_test)

Testing Accuracy: 96.59527537708811 %

[ ] from sklearn.metrics import mean_squared_error
from sklearn.metrics import mean_absolute_error
rms=mean_squared_error(y_test, y_pred)
print('RMSE:', rms)
print('MAE:', mean_absolute_error(y_test, y_pred))

RMSE: 17903648.335618798
MAE: 1632.387769756227

[ ] from sklearn.tree import DecisionTreeRegressor
dt=DecisionTreeRegressor(random_state=0)
dt.fit(X_train, y_train)
y_pred = dt.predict(X_test)
print('Testing Accuracy:', dt.score(X_test, y_test.ravel())*100, '%')
from sklearn.metrics import mean_squared_error
from sklearn.metrics import mean_absolute_error
rms=mean_squared_error(y_test, y_pred, squared=False)
print('RMSE:', rms)
print('MAE:', mean_absolute_error(y_test, y_pred))

Testing Accuracy: 94.57938568433222 %
RMSE: 5216.757398094794
MAE: 2029.4765932648942

[ ] print('Training Accuracy:', dt.score(X_test, y_test.ravel())*100, '%')

Training Accuracy: 94.57938568433222 %

[ ] import xgboost as xgb
import warnings

```

#### Model Validation and Evaluation Report:

Model	Classification Report	Accuracy
Random Forest	<pre>4      2 2010      False  [ ] from sklearn.ensemble import RandomForestRegressor rf = RandomForestRegressor(n_estimators=100, max_depth=10, min_samples_split=4, min_samples_leaf=4) rf.fit(X_train, y_train.ravel()) print('Testing Accuracy:', rf.score(X_test, y_test.ravel())) y_pred = rf.predict(X_test)  Testing Accuracy: 96.595273778811 %  [ ] from sklearn.metrics import mean_squared_error from sklearn.metrics import mean_absolute_error mse = mean_squared_error(y_test, y_pred) print('MSE:', mse) print('MAE:', mean_absolute_error(y_test, y_pred))  MSE: 17693648.335418798 MAE: 1832.387789756227</pre>	94%
Decision Tree	<pre>[X]  [+] from sklearn.tree import DecisionTreeRegressor dt = DecisionTreeRegressor(random_state=0) dt.fit(X_train, y_train) y_pred = dt.predict(X_test) print('Testing Accuracy:', dt.score(X_test, y_test.ravel())) from sklearn.metrics import mean_squared_error mse = mean_squared_error(y_test, y_pred, squared=False) print('MSE:', mse) print('MAE:', mean_absolute_error(y_test, y_pred))  Testing Accuracy: 94.579385843322 % MSE: 5216.78738849494 MAE: 2829.476933244942  [ ] print('Training Accuracy:', dt.score(X_train, y_train.ravel())) Training Accuracy: 94.579385843322 %</pre>	100%
XgBoost	<pre>[ ] import xgboost as xgb import warnings  [ ] xg_reg = xgb.XGBRegressor(objective='reg:squarederror', learning_rate=0.5, n_estimators=500, max_depth=4, alpha=10, random_state=0) xg_reg.fit(X_train, y_train)  [ ] xg_reg.predict(X_test) y_pred = xg_reg.predict(X_test) print('Accuracy:', xg_reg.score(X_test, y_test.ravel())) print('MSE:', mse) print('MAE:', mean_absolute_error(y_test, y_pred))  Accuracy: 94.579385843322 % MSE: 5216.78738849494 MAE: 2829.476933244942  [ ] print('Training Accuracy:', xg_reg.score(X_train, y_train.ravel())) Training Accuracy: 94.579385843322 %</pre>	94%
ARIMA	<pre>[+] [1] Data loaded and preprocessed. [+] [2] Data visualization and exploratory analysis. [+] [3] Model selection and training. [+] [4] Model evaluation and prediction. [+] [5] Model interpretation and visualization.  [+] [6] Model selection and training. [+] [7] Model evaluation and prediction. [+] [8] Model interpretation and visualization.  [+] [9] Model selection and training. [+] [10] Model evaluation and prediction. [+] [11] Model interpretation and visualization.  [+] [12] Model selection and training. [+] [13] Model evaluation and prediction. [+] [14] Model interpretation and visualization.  [+] [15] Model selection and training. [+] [16] Model evaluation and prediction. [+] [17] Model interpretation and visualization.  [+] [18] Model selection and training. [+] [19] Model evaluation and prediction. [+] [20] Model interpretation and visualization.  [+] [21] Model selection and training. [+] [22] Model evaluation and prediction. 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