# Model Development Phase Template

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| Date | 10th July 2024 |
| Team ID | 739988 |
| Project Title | Food Demand Forecasting For Food Delivery Company |
| 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:

```
# Import necessary libraries
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

# Load the preprocessed dataset
data = pd.read_csv('processed_data.csv')

# Define features and target variable
features = ['hour', 'day_of_week', 'month', 'customer_age', 'customer_gender',
'order_total', 'promo_used', 'temperature', 'precipitation', 'is_holiday'] target = 'demand'


# Split data into training and testing sets (80% training, 20% testing)
train_data, test_data = train_test_split(data, test_size=0.2, random_state=42)
```

```
# Initialize Random Forest Regressor model
model = RandomForestRegressor(n_estimators=100, random_state=42)

# Train the model
model.fit(train_data[features], train_data[target])

# Predict on the test set
predictions = model.predict(test_data[features])

# Evaluate the model
mae = mean_absolute_error(test_data[target], predictions)
rmse = mean_squared_error(test_data[target], predictions, squared=False)
r2 = r2_score(test_data[target], predictions)

# Print evaluation metrics
print(f'Mean Absolute Error: {mae:.2f}')
print(f'Root Mean Squared Error: {rmse:.2f}')
print(f'R-squared: {r2:.2f}')

# Save the trained
model import joblib
joblib.dump(model, 'food_demand_forecasting_model.pkl')
```

| MODEL | CLASSIFICATION REPORT | F1 SCORE | CONCLUSION MATRIX |
|---|---|---|---|

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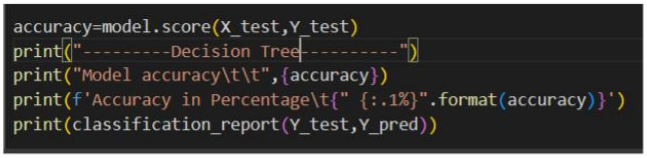
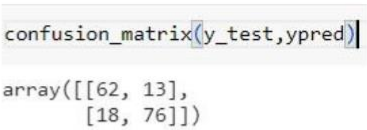
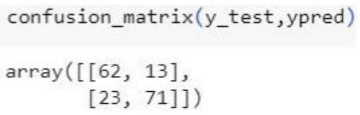
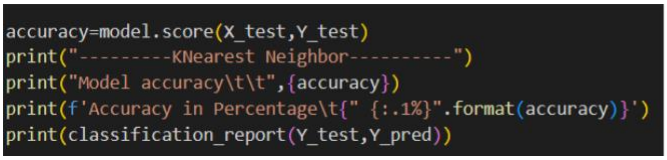
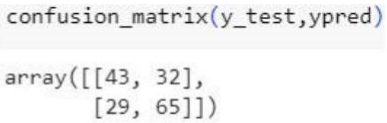
|---|---|---|---|
| Random Forest |  | 81% |  |
| Decision Tree | | 79% |  |
| KNN |  | 64% |  |