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import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import joblib
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from xgboost import XGBRegressor
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

# Load dataset
df = pd.read_csv('data/traffic_data.csv')

# Preprocessing
df['timestamp'] = pd.to_datetime(df['timestamp'])
df['hour'] = df['timestamp'].dt.hour
df['day_of_week'] = df['timestamp'].dt.dayofweek

# Feature selection
features = ['hour', 'day_of_week', 'temperature', 'precipitation']
X = df[features]
y = df['traffic_volume']

# Train-test split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)

# Model training
model = XGBRegressor(n_estimators=100, learning_rate=0.1, max_depth=5)
model.fit(X_train, y_train)

# Evaluation
y_pred = model.predict(X_test)
print("MAE:", mean_absolute_error(y_test, y_pred))
print("RMSE:", np.sqrt(mean_squared_error(y_test, y_pred)))
print("R2 Score:", r2_score(y_test, y_pred))

# Save the model
joblib.dump(model, 'models/traffic_model.pkl')
```