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import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

df = pd.read_csv('day.csv')

df.drop(['instant', 'dteday', 'casual', 'registered'], axis=1, inplace=True)

categorical_cols = ['season', 'yr', 'mnth', 'holiday', 'weekday', 'workingday', 'weathersit']
for col in categorical_cols:
    df[col] = df[col].astype('category')

df_encoded = pd.get_dummies(df, drop_first=True)

scale_cols = ['temp', 'atemp', 'hum', 'windspeed']
scaler = StandardScaler()
df_encoded[scale_cols] = scaler.fit_transform(df_encoded[scale_cols])

X = df_encoded.drop('cnt', axis=1)
y = df_encoded['cnt']

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

model = LinearRegression()
model.fit(X_train, y_train)

y_pred = model.predict(X_test)
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)
r2 = r2_score(y_test, y_pred)

print("🔍 Model Evaluation:")
print(f"Mean Absolute Error (MAE): {mae:.2f}")
print(f"Mean Squared Error (MSE): {mse:.2f}")
print(f"Root Mean Squared Error (RMSE): {rmse:.2f}")
print(f"R² Score: {r2:.4f}")

🔄 🔍 Model Evaluation:
Mean Absolute Error (MAE): 583.02
Mean Squared Error (MSE): 634351.36
Root Mean Squared Error (RMSE): 796.46
R² Score: 0.8418

import joblib
joblib.dump(model, 'bike_model.pkl')

🔄 ['bike_model.pkl']

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