Black Friday Sales Prediction – Python ML Code

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import pandas as pd
import numpy as np

from sklearn.model_selection import train_test_split
from sklearn.preprocessing import LabelEncoder
from sklearn.metrics import mean_absolute_error, r2_score

from xgboost import XGBRegressor

# Load Dataset
data = pd.read_csv("BlackFriday.csv")

# Data Cleaning
data['Product_Category_2'].fillna(0, inplace=True)
data['Product_Category_3'].fillna(0, inplace=True)

# Feature Engineering
label_cols = ['Gender', 'Age', 'City_Category', 'Stay_In_Current_City_Years']
encoder = LabelEncoder()

for col in label_cols:
    data[col] = encoder.fit_transform(data[col])

data.drop(['User_ID', 'Product_ID'], axis=1, inplace=True)

# Train-Test Split
X = data.drop('Purchase', axis=1)
y = data['Purchase']

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=300,
    learning_rate=0.08,
    max_depth=8,
    subsample=0.8,
    colsample_bytree=0.8,
    random_state=42
)

model.fit(X_train, y_train)

# Model Evaluation
predictions = model.predict(X_test)

mae = mean_absolute_error(y_test, predictions)
r2 = r2_score(y_test, predictions)

print("Mean Absolute Error:", mae)
print("R2 Score:", r2)
```