import pandas as pd

import numpy as np

from sklearn.linear\_model import LinearRegression

# Load the data

data = pd.read\_csv('Advertising.csv')

# Define the independent and dependent variables

X = data[['TV', 'radio', 'newspaper']]

y = data['sales']

# Fit the multiple linear regression model

model = LinearRegression()

model.fit(X, y)

# Predict values

y\_pred = model.predict(X)

# Calculate Residual Standard Error (RSE)

rss = np.sum((y - y\_pred) \*\* 2) # Residual Sum of Squares

n = len(y)

p = X.shape[1]

rse = np.sqrt(rss / (n - p - 1))

# Calculate R-squared

r\_squared = model.score(X, y)

# Calculate F-statistic

tss = np.sum((y - np.mean(y)) \*\* 2) # Total Sum of Squares

f\_statistic = (r\_squared / p) / ((1 - r\_squared) / (n - p - 1))

# Print the results

print(f"Residual Standard Error (RSE): {rse}")

print(f"R-squared: {r\_squared}")

print(f"F-statistic: {f\_statistic}")