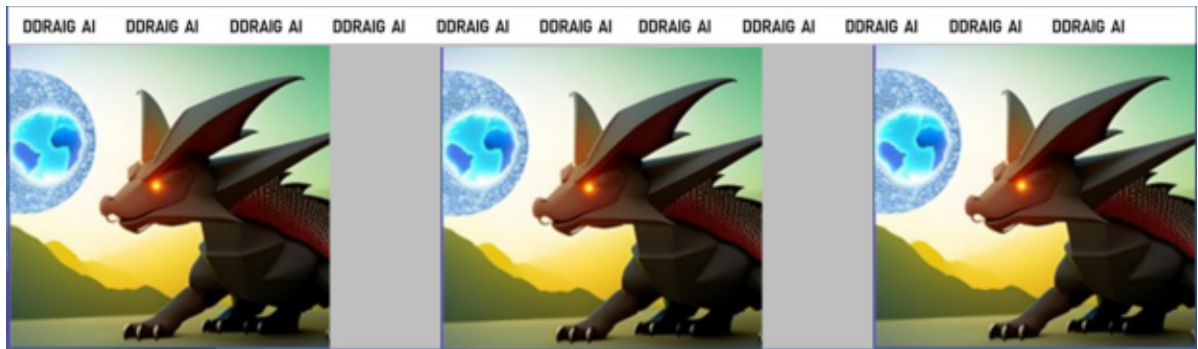


DEMAND FORECAST

USING ELASTICITY



C:\Users\alunb\OneDrive\Desktop\demand
forecast\Demand_Forecast2023_12_31_11_51_13

Executive Summary

Fluctuations in price of products usually impacts its sale, e.g. as the price decreases, the more products are sold. This simplistic approach does not always cover other possible contributing attributes in predicting future sales

The model approach used here uses advanced time series techniques, with main holidays as well as price elasticity to predict future sales

Using Adjusted R-square and MAPE, we can measure the performance of each model

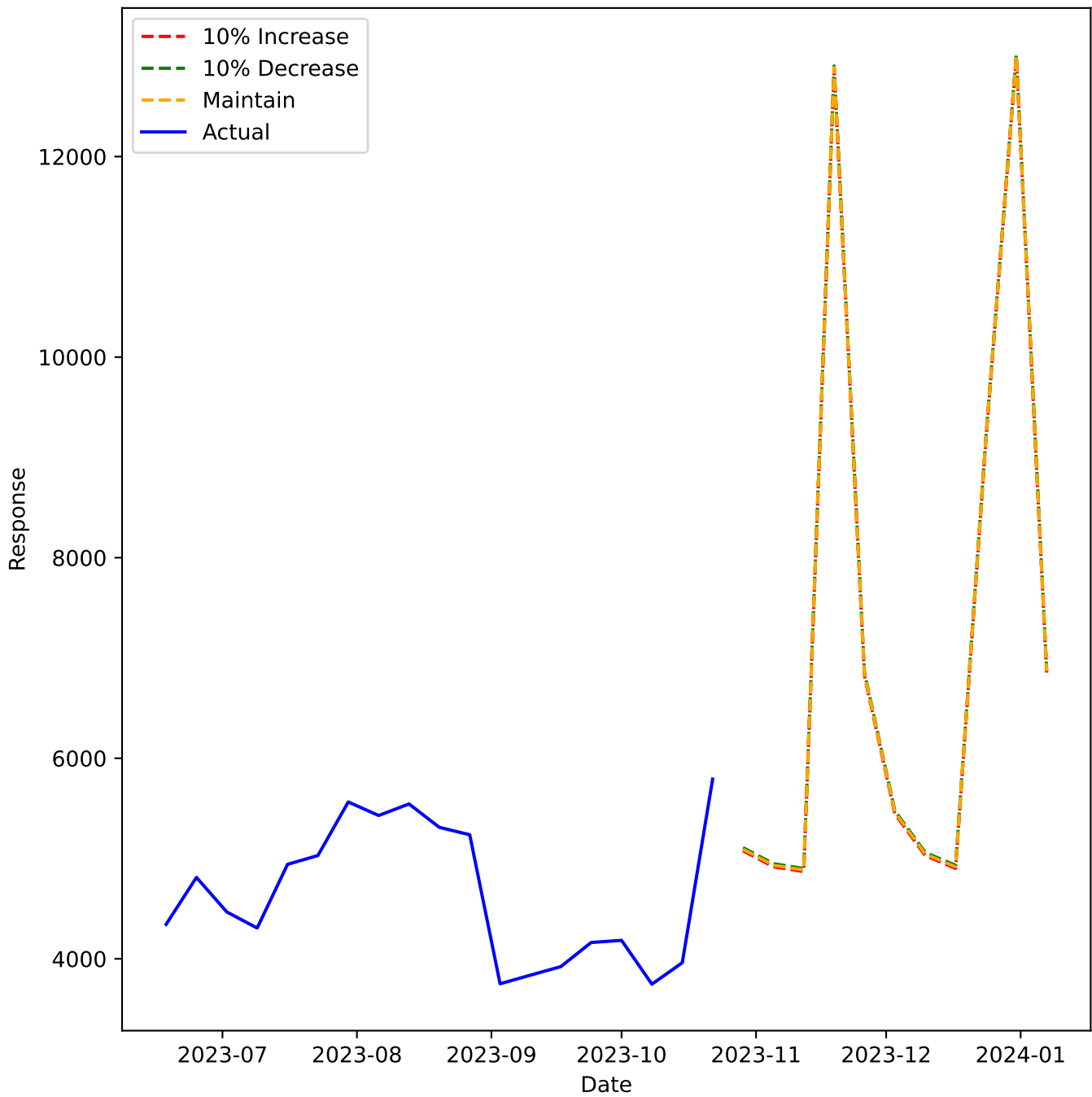
Table of high level Statistics

Product	Adjust R-sq	RSME	MAPE	Dec 10%	Inc 10%
Product1	0.637	1323.9	0.1332	15.0	-15.0
Product2	0.709	401.9	0.0898	242.0	-242.0
Product3	0.715	731.0	0.1617	159.0	-159.0
Product4	0.725	13.7	0.3493	-0.0	0.0
Product5	0.742	368.9	0.1002	160.0	-160.0
Product6	0.676	120.0	0.1368	55.0	-55.0
Product7	0.519	1219.5	0.1612	298.0	-298.0

Charts of

The models

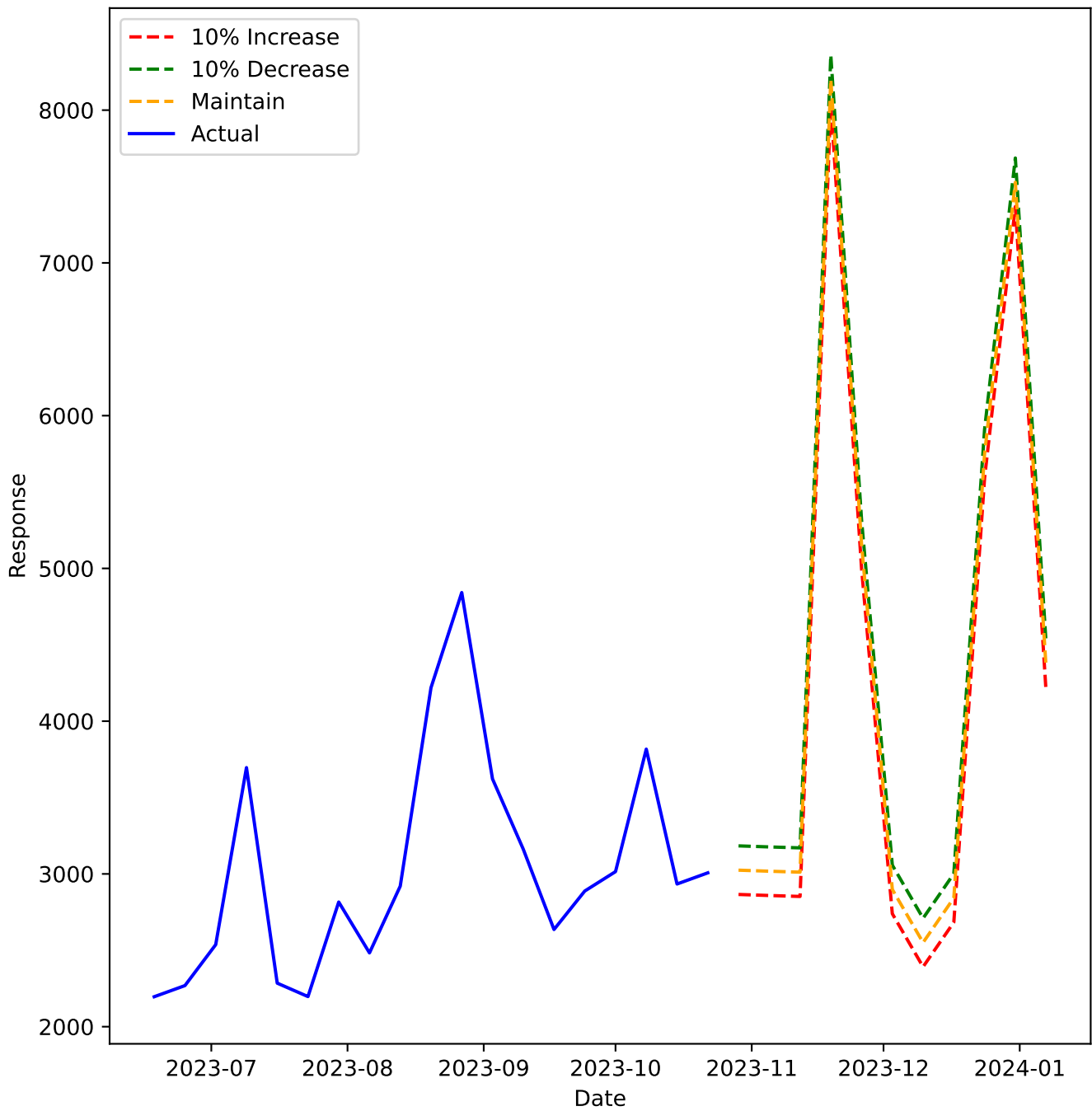
Product1



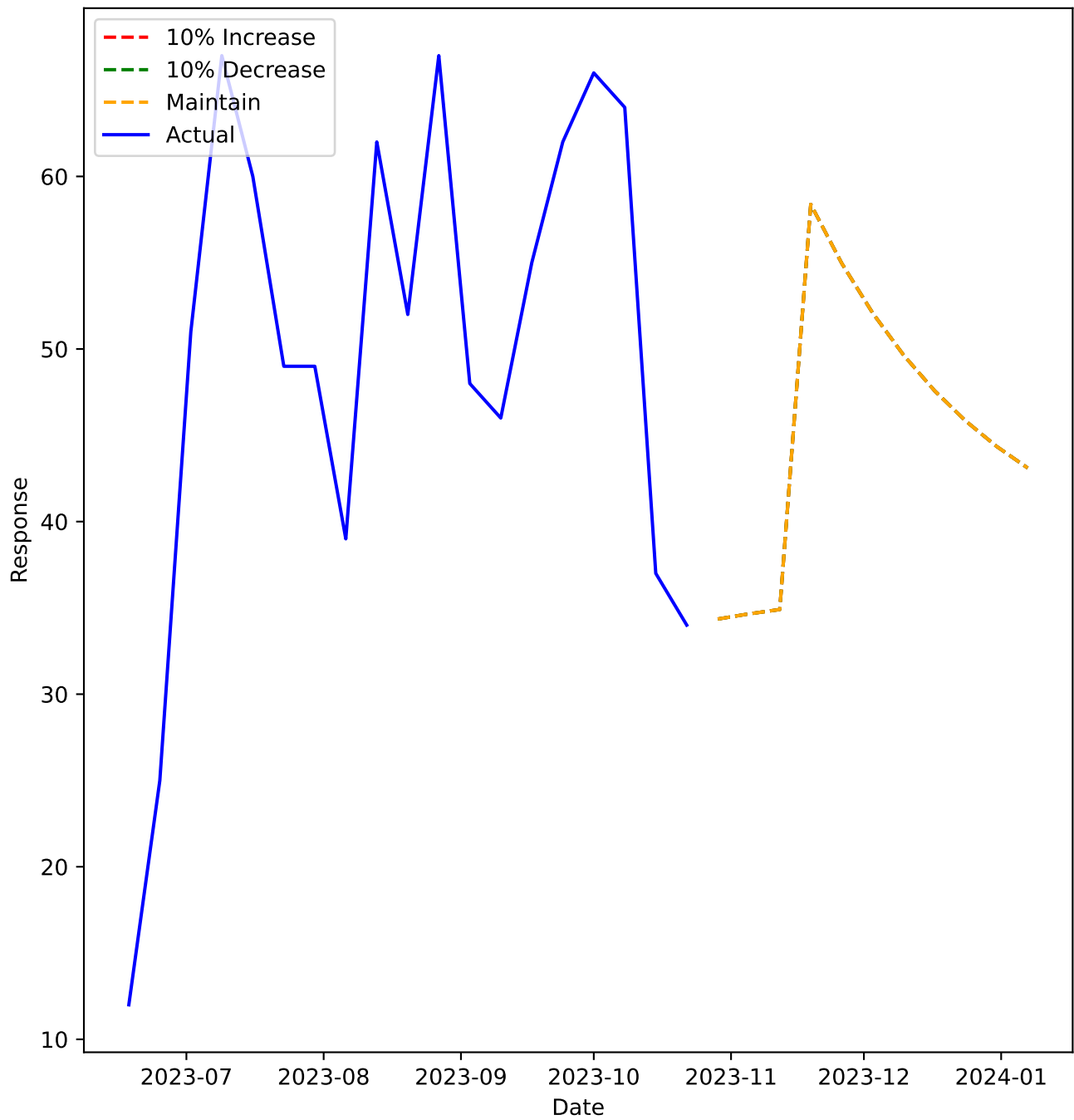
Product2



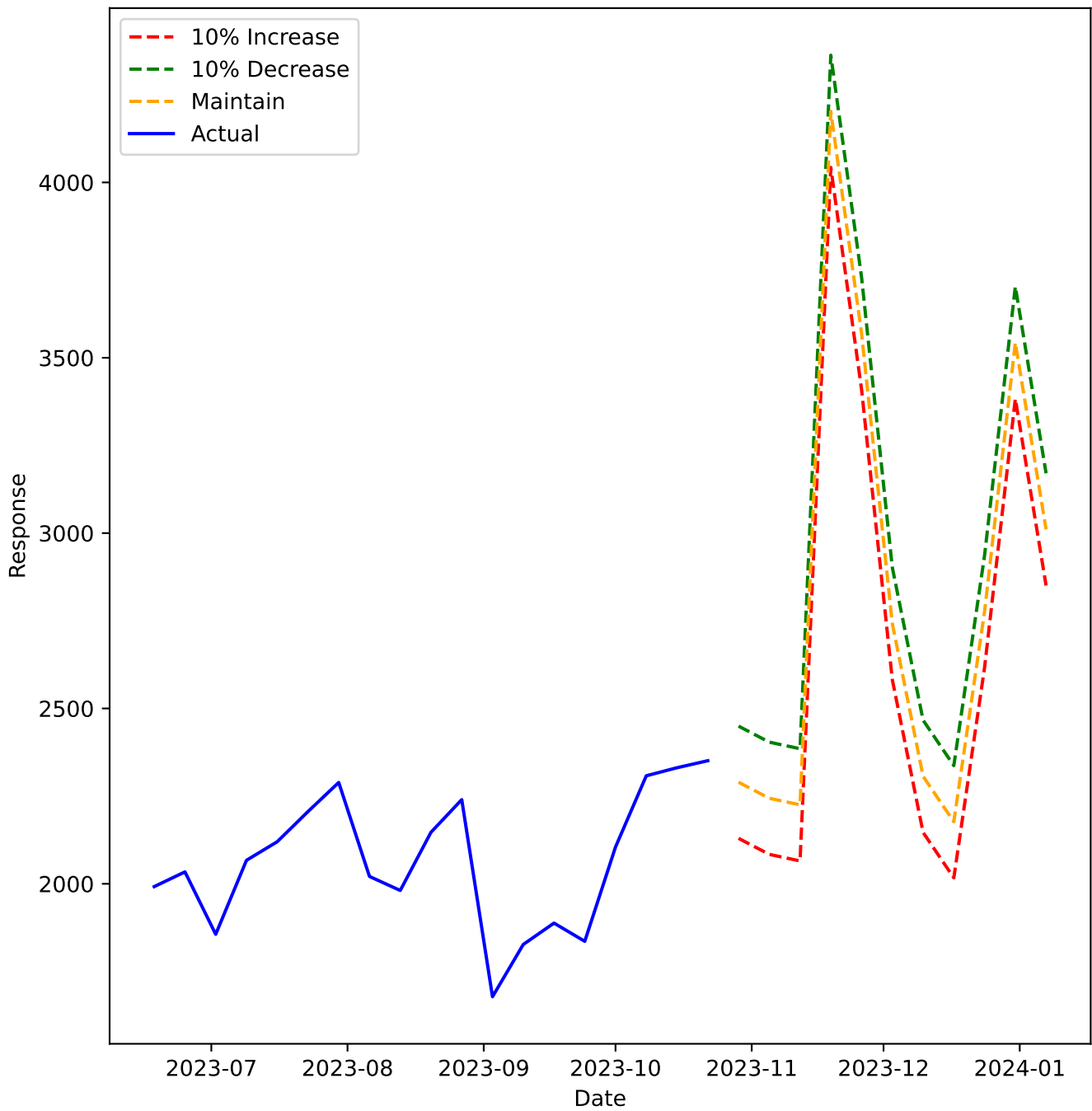
Product3



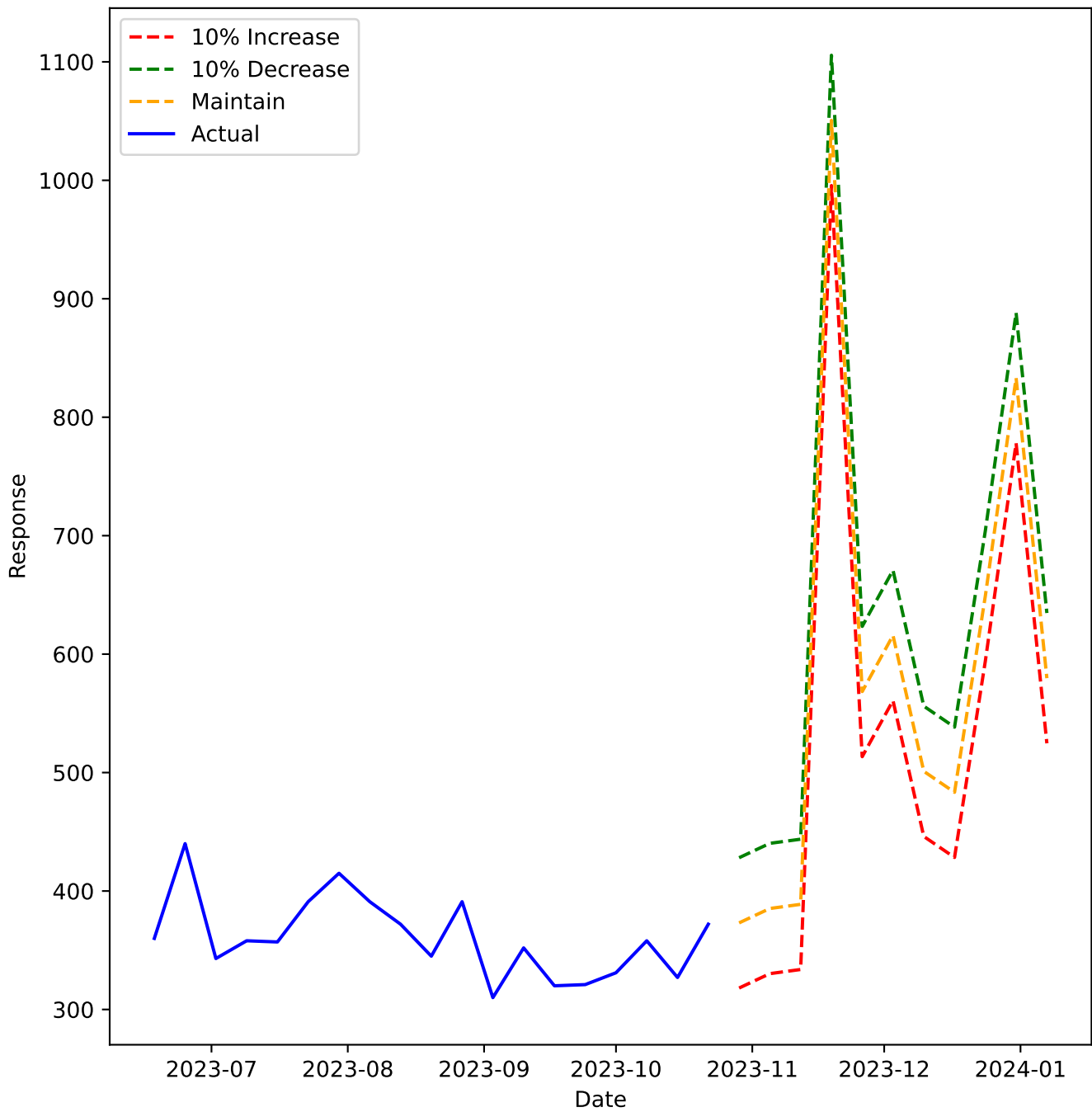
Product4



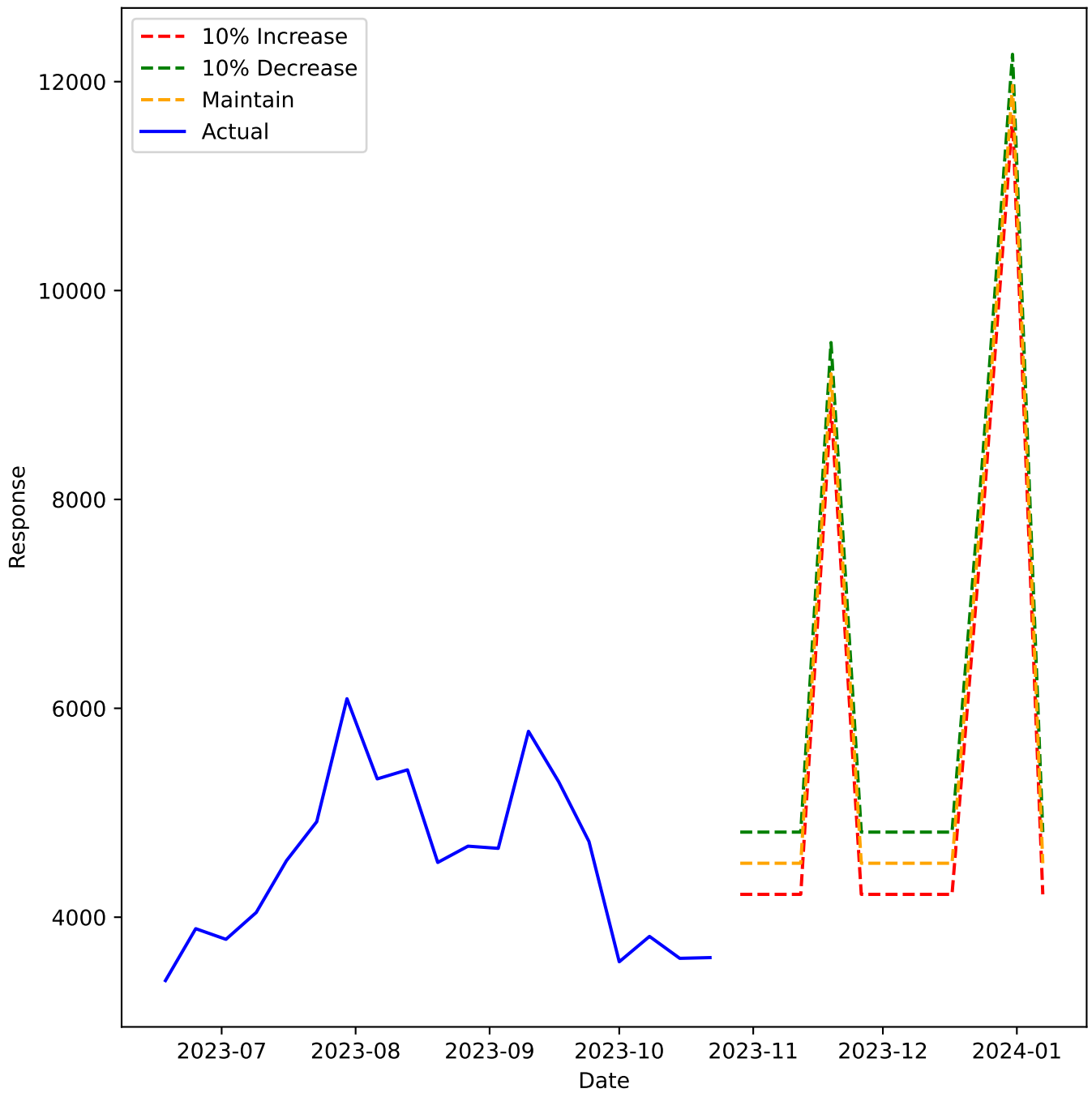
Product5



Product6



Product7



Key

Presuming we are have used data segmented at a week level

Lag1 = previous weeks data

Lag2 = data from the previous 2 weeks

MA2 = 2 week Moving Average (Lag1 + Lag2) / 2

Elast = (Current Price - Initial Price) / Initial Price

If elast =0 then price elasticity has no affect on sales
Easter, Black Friday, Christmas etc... key UK holiday dates

Measurements

Actual Value = the value used that we are trying to predict

Predicted Value = the value the model predicted

Residuals = difference between actual and predicted values at each point

Squared Error = the Residual squared, at each point

Absolute Error = absolute value of Residual/Predicted

Adjusted R-sqaure is a goodness of fit between Predicted and Actual

Mean Squared Error (MSE) = the Overall mean of Squared Error

Root Mean Squared Error (RMSE) = square root of MSE

MAPE = Mean of Absolut Error

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