

# IOWA LIQUOR INVENTORY

restocking predictions for 2024 at  
Iowa's busiest liquor retailer

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# business context

**stakeholder:** store manager at Hy-Vee Grocery Store in Des Moines, IA

**goal:** predict liquor inventory restocking throughout 2024





# project overview

**the big picture:** start by training models on **all** liquor types from 2017-2023

**project target:** the number of bottles sold in each transaction

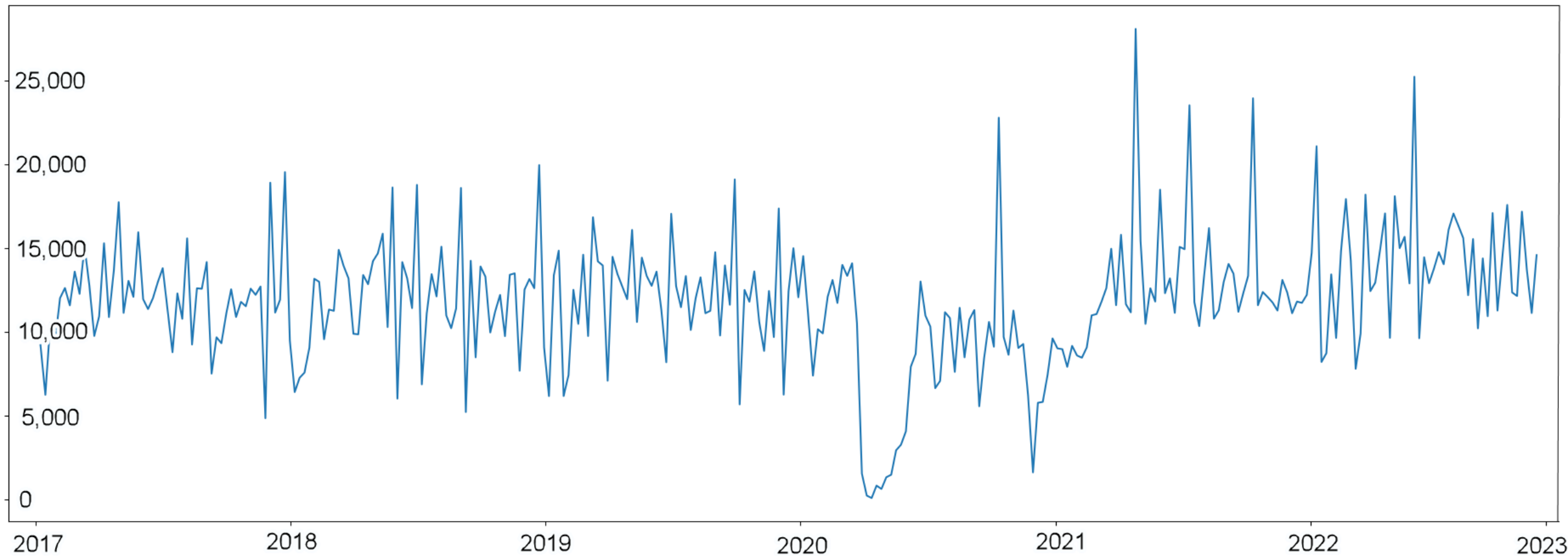
**results:** predictions for popular liquor categories throughout 2024 on a weekly basis



# data source

- originally downloaded from [Iowa's open data page](#)
- features data from all Iowan liquor retailers dating back to 2012
- this project narrows the scope to **Iowa's busiest store dating to 2017**
- this data subset contains **well over 17 million transactions**

inventory sold 2017-2023 (all categories)



## modeling methodology

- 1.**isolate** the 'Date' & 'Bottles Sold' columns
- 2.**set aside** the last year of data as a **test set** (2023)
- 3.**train the model** on the first five years' data (2017-2022)
- 4.**compare** the model's performance on **train & test sets**
- 5.**forecast** for 2024 using all six years' data

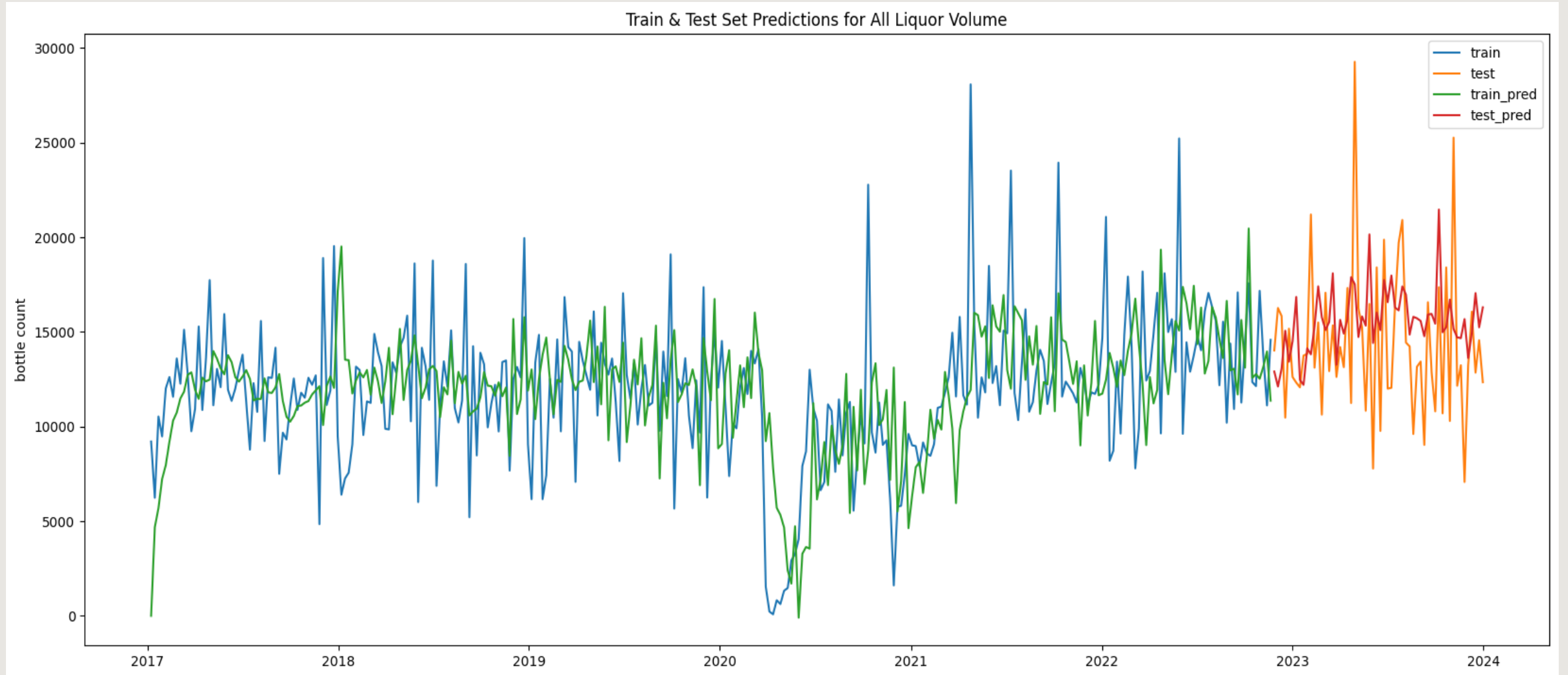
# evaluating predictions

## Root Mean Square Error (RMSE)

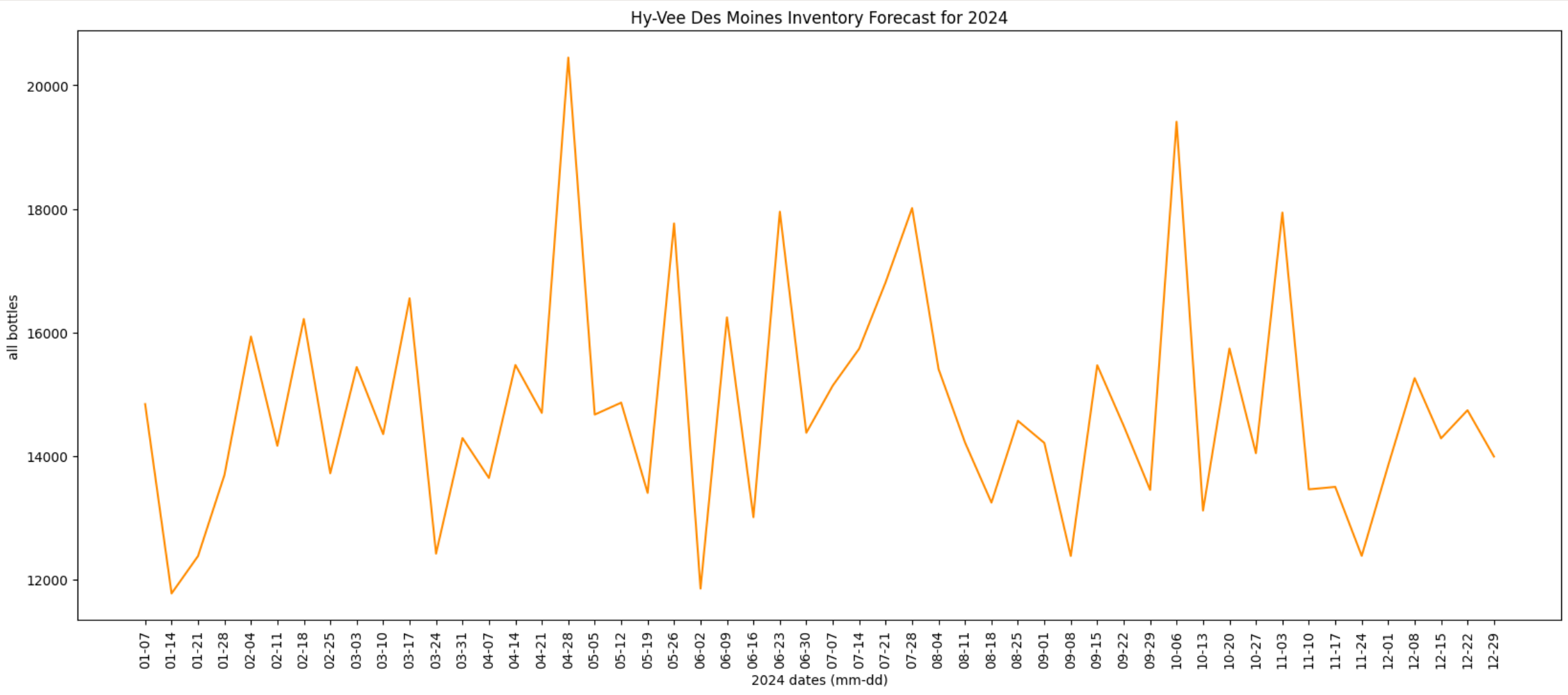
- measures model prediction accuracy
- the lower, the better

# overall inventory predictions for Hy-Vee #3

train & test set predictions



overall 2024 inventory **forecast** for Hy-Vee #3



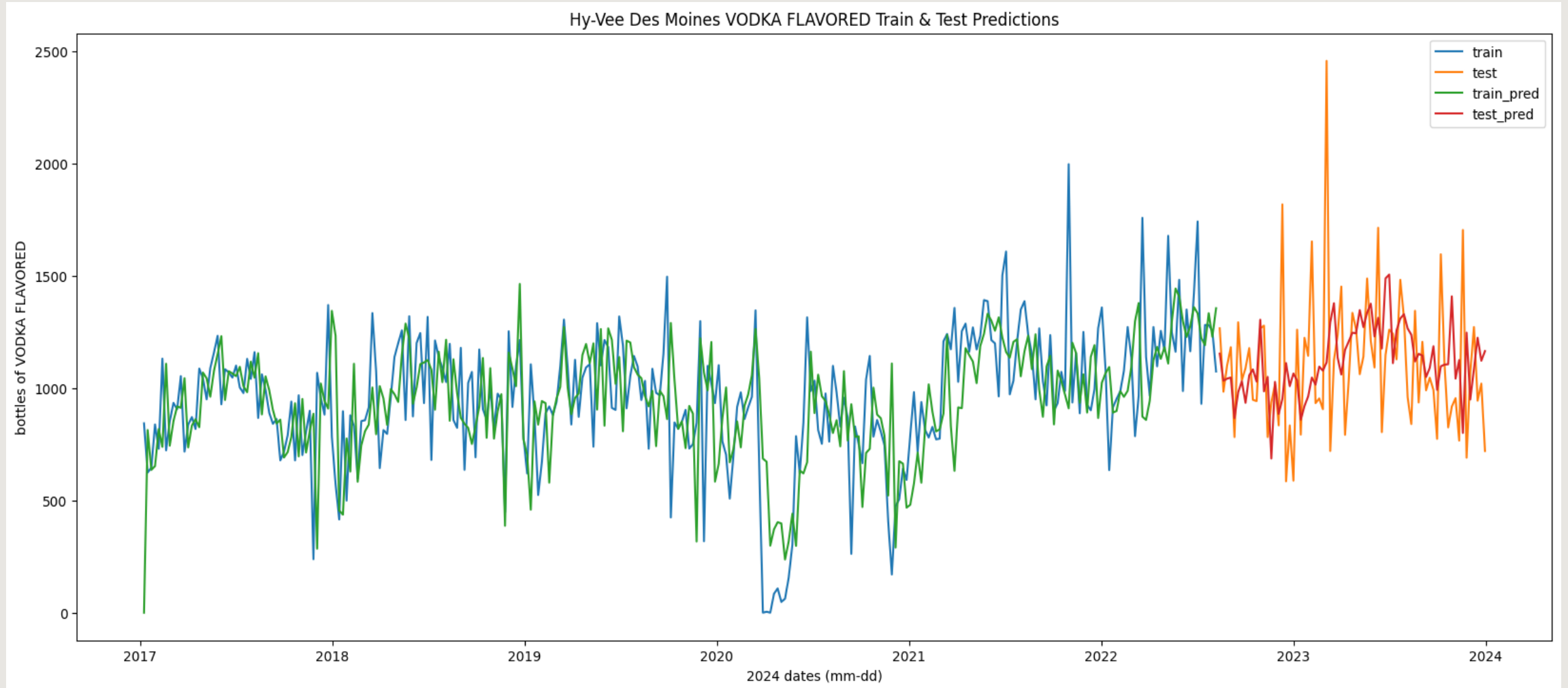


liquor category	# of bottles sold 2017-2023
flavored vodka	23,299
liqueurs	19,167
tequila	14,833
rum	13,019
non-flavored vodka	11,507
schnapps	9,310
bourbon	9,195
gin	6,753
blended & other whiskies	5,893

popular liquor  
categories

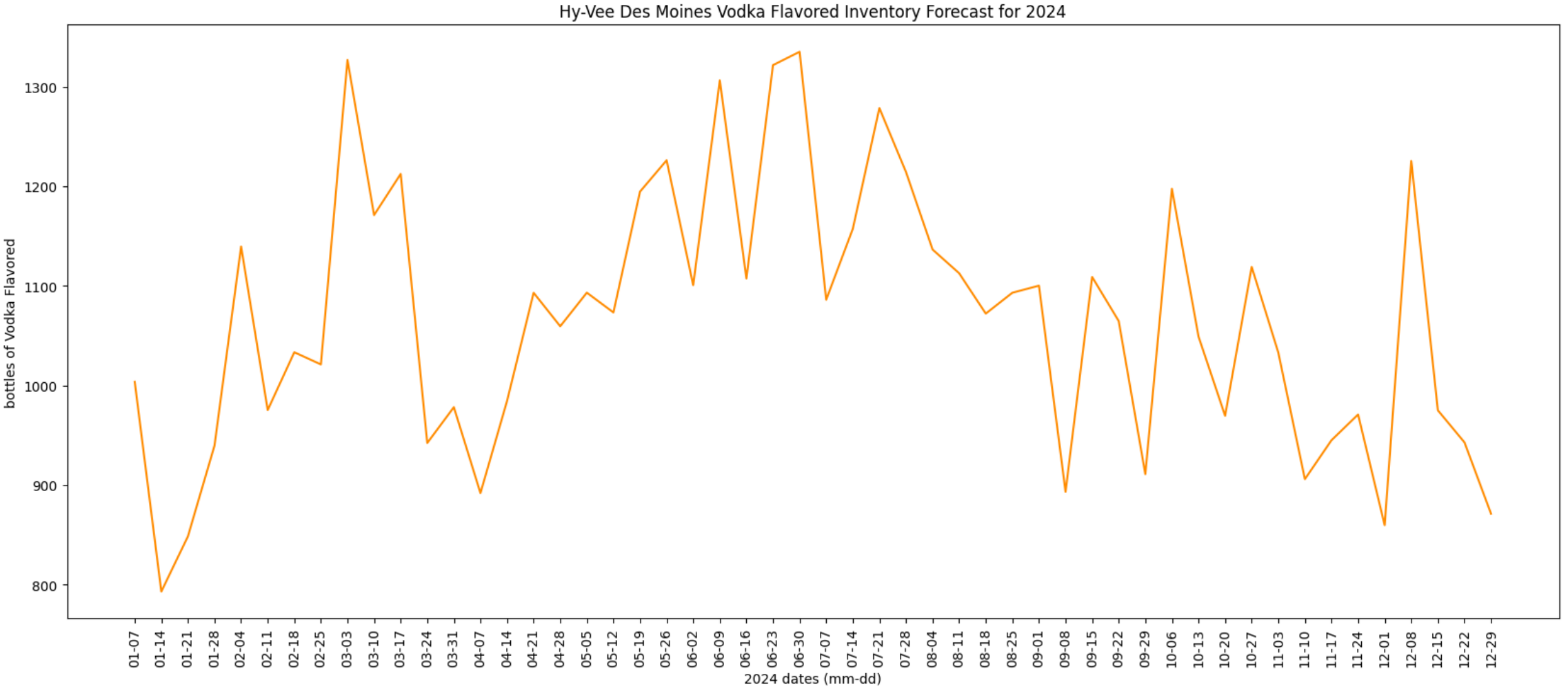
# flavored vodka

train & test set predictions



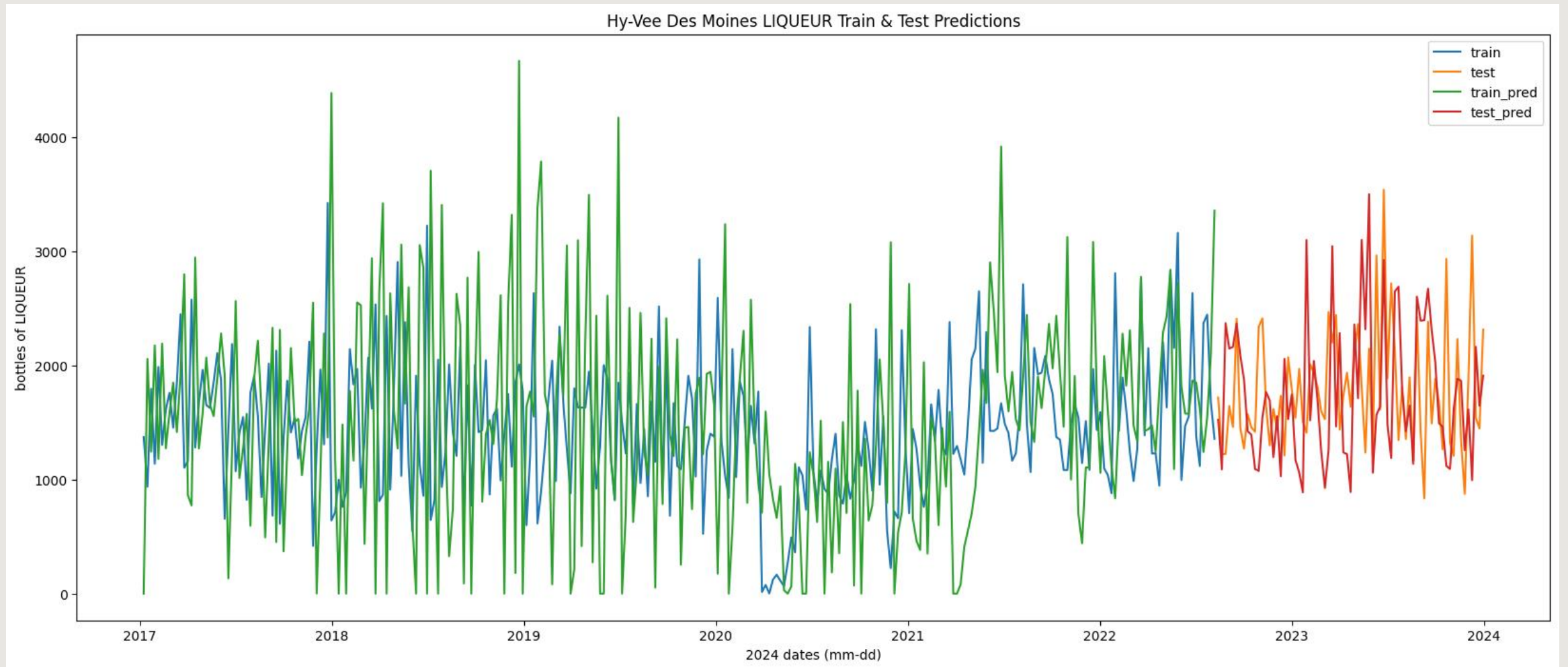
# flavored vodka

forecast for 2024



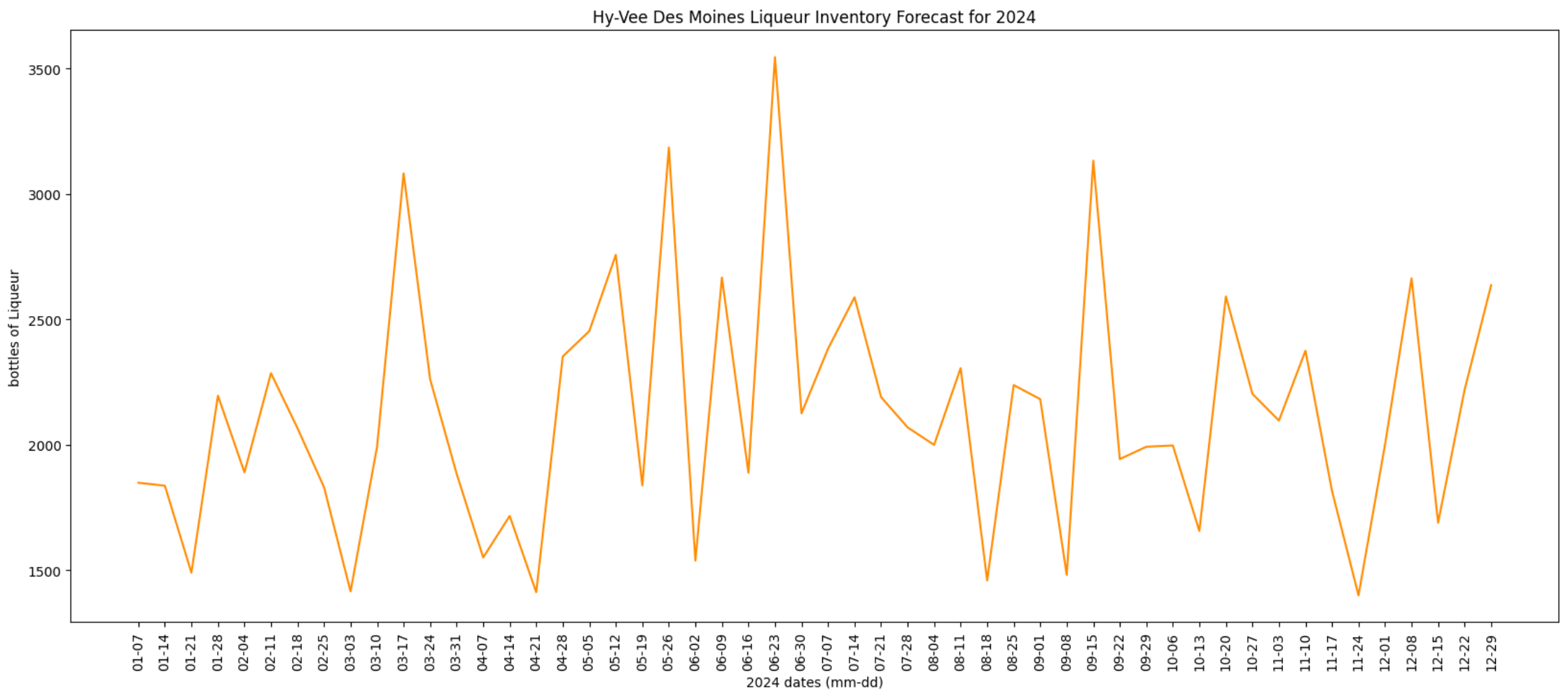
# liqueurs

train & test set predictions



# liqueurs

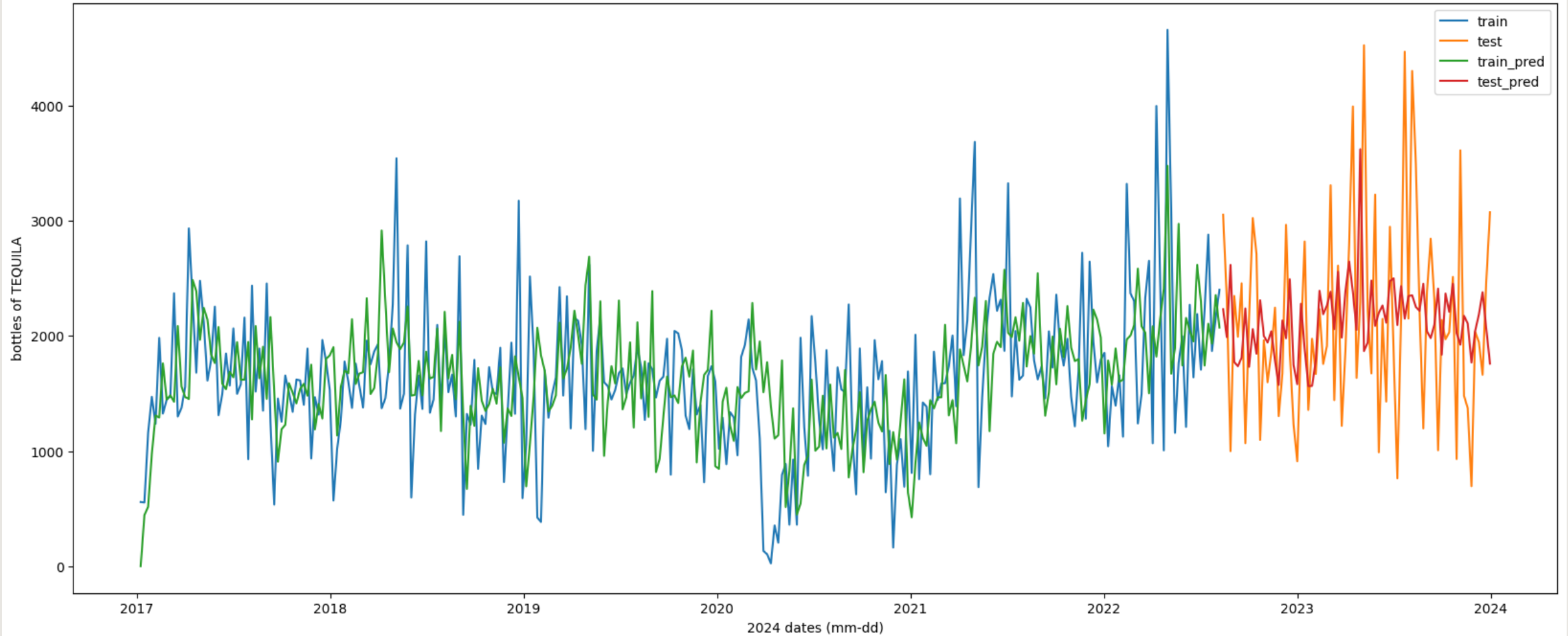
forecast for 2024



# tequila

train & test set predictions

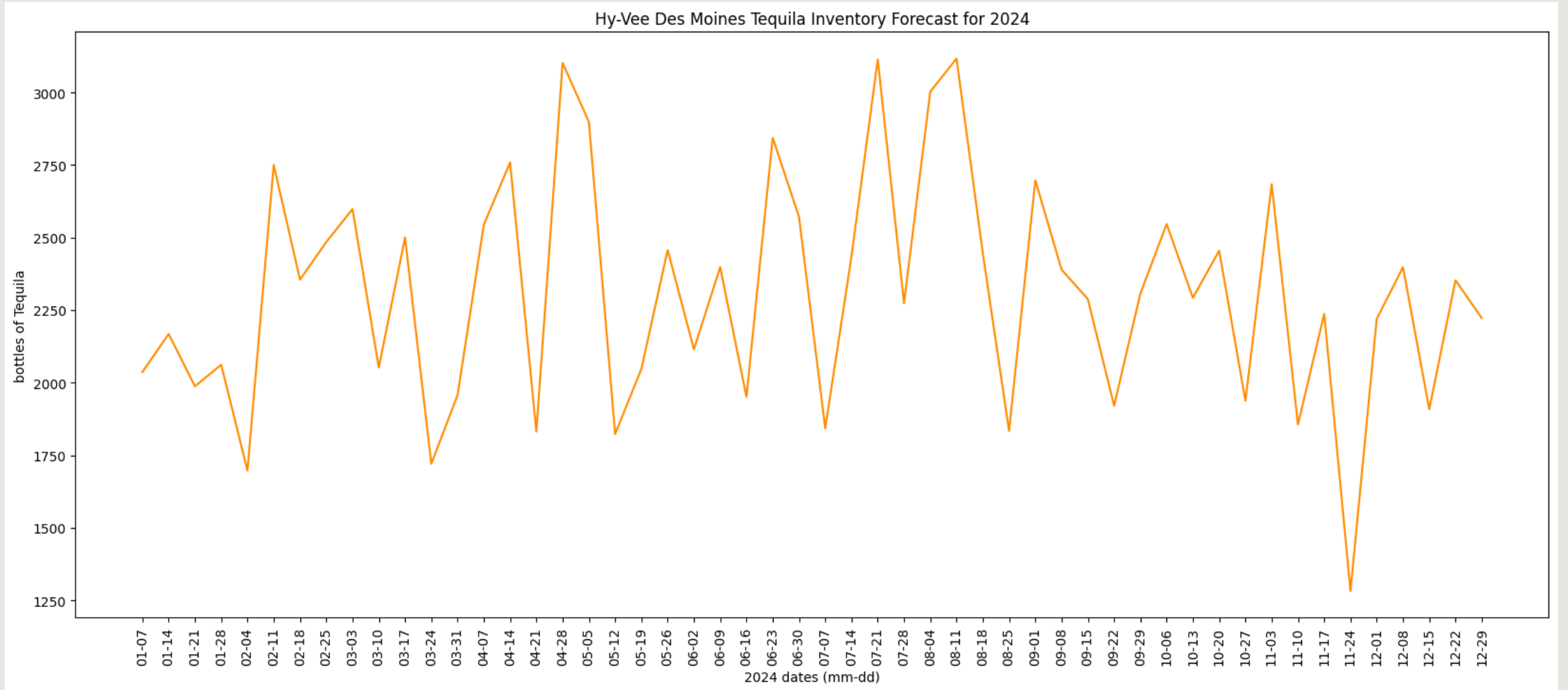
Hy-Vee Des Moines TEQUILA Train & Test Predictions





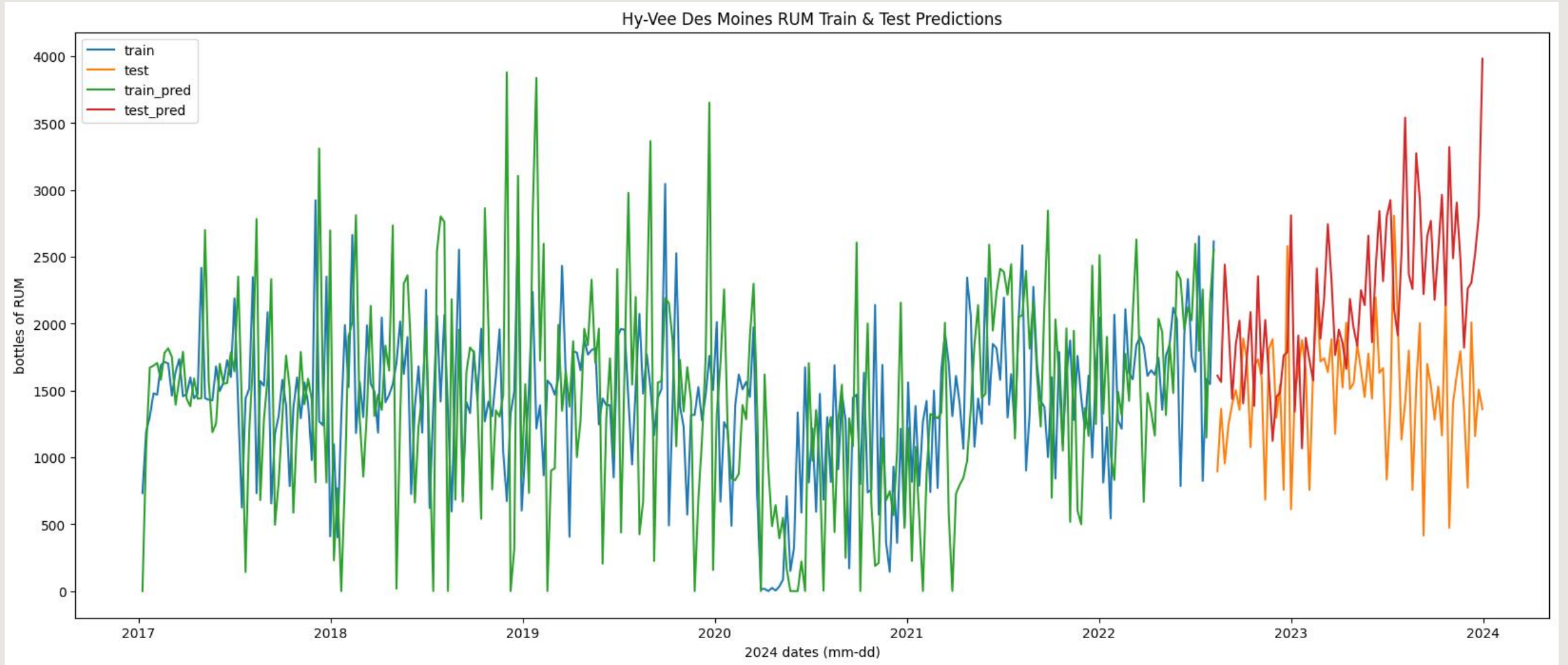
# tequila

## forecast for 2024



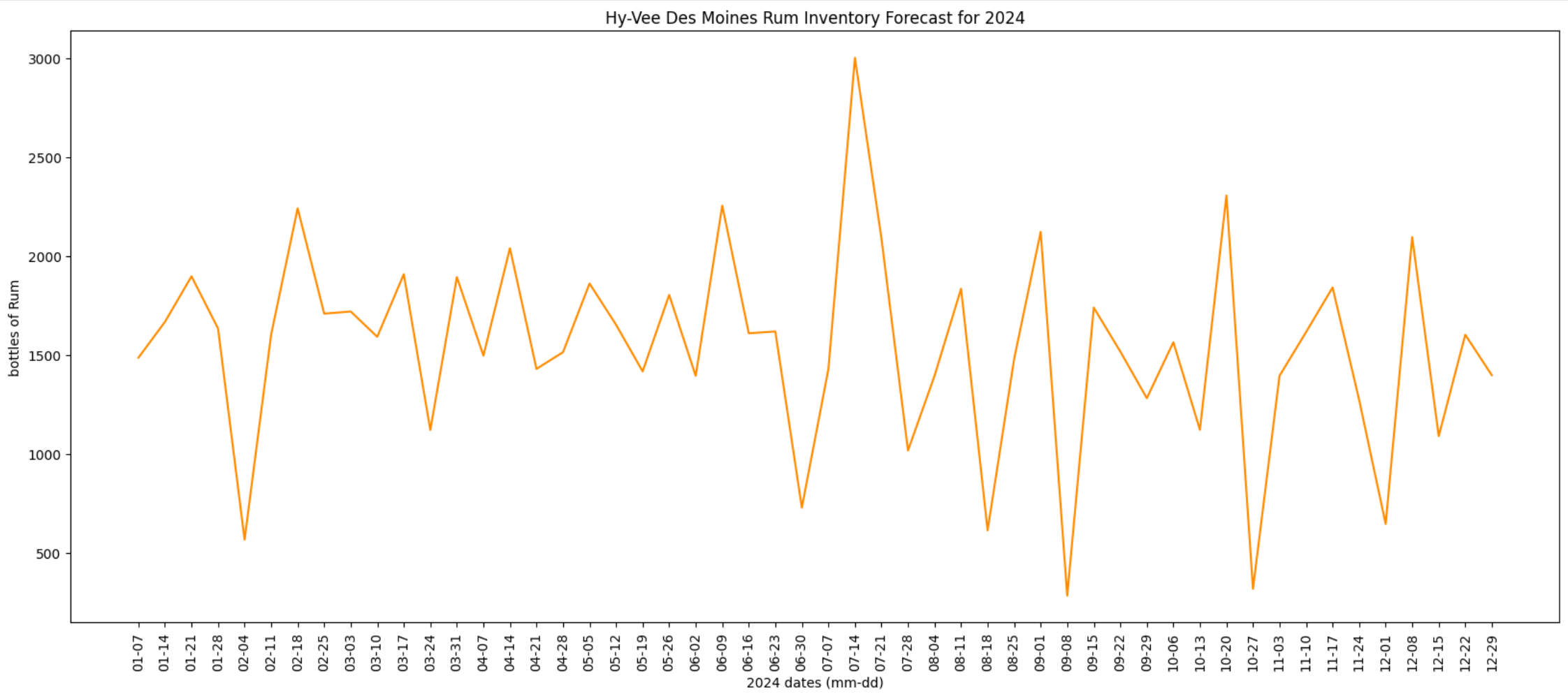
rum

train & test set predictions



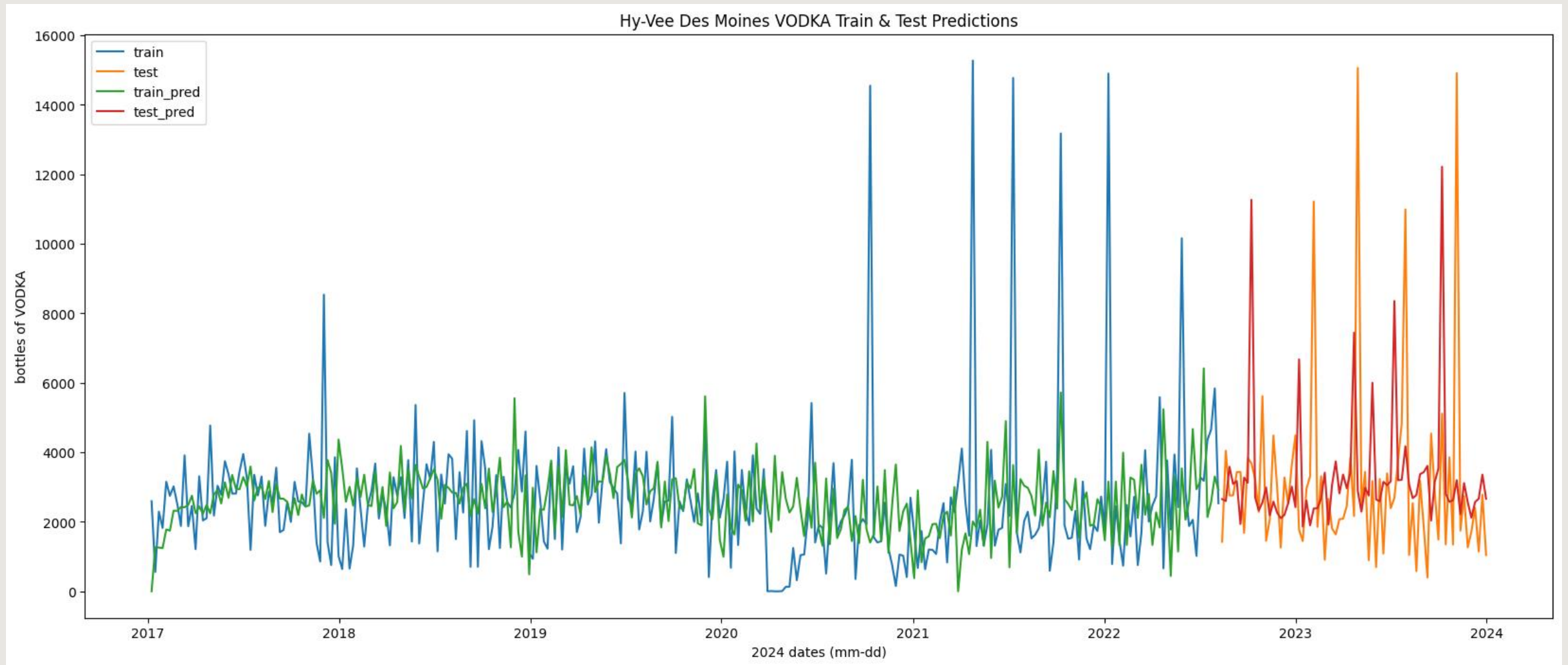
rum

forecast for 2024



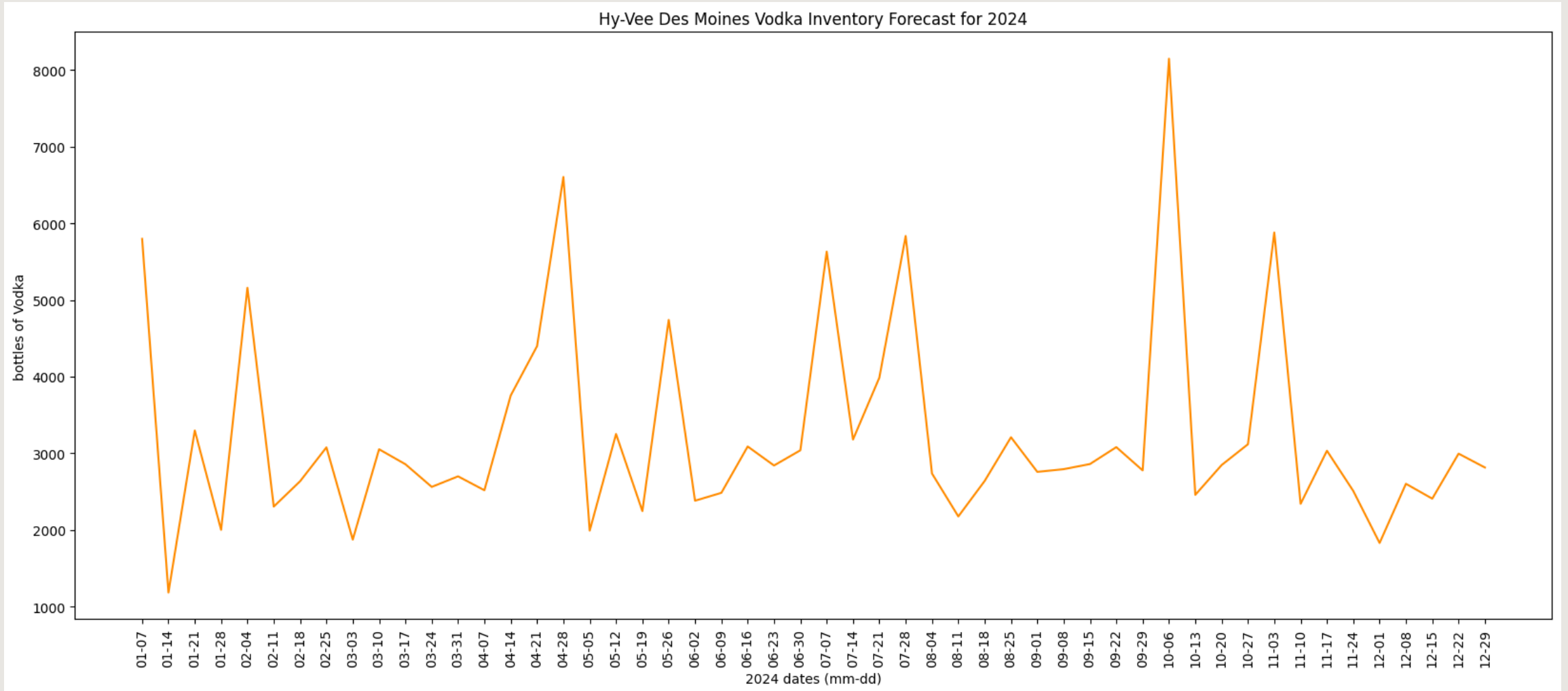
# non-flavored vodka

train & test set predictions



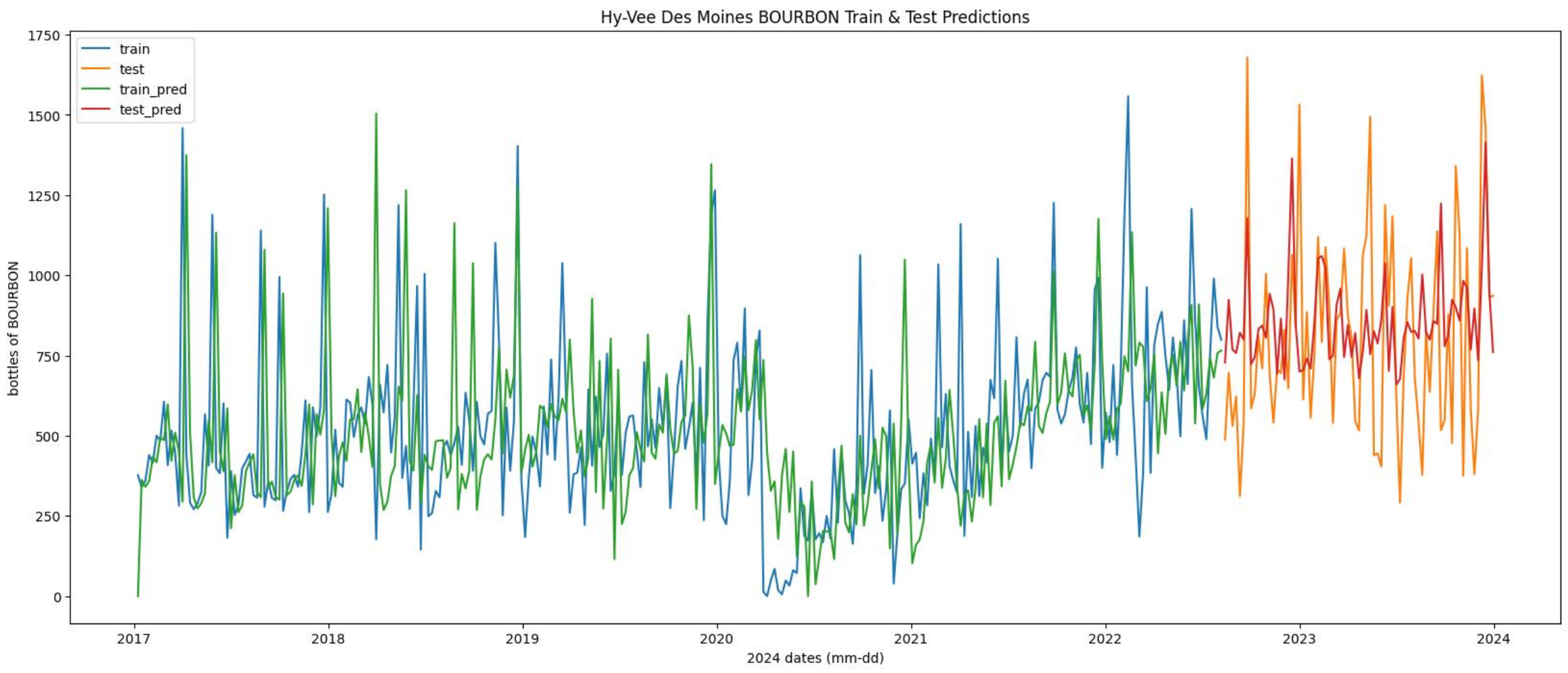
# non-flavored vodka

forecast for 2024



# bourbon

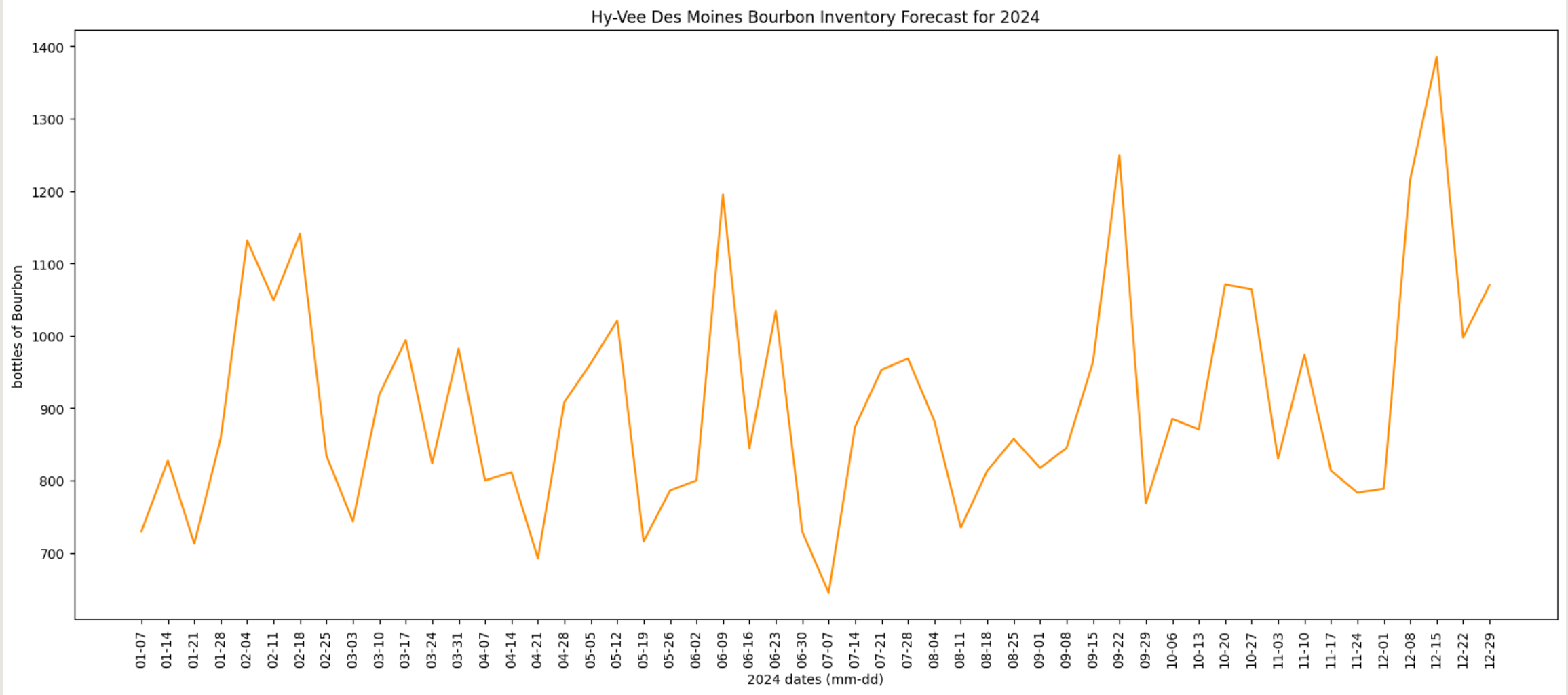
train & test set predictions





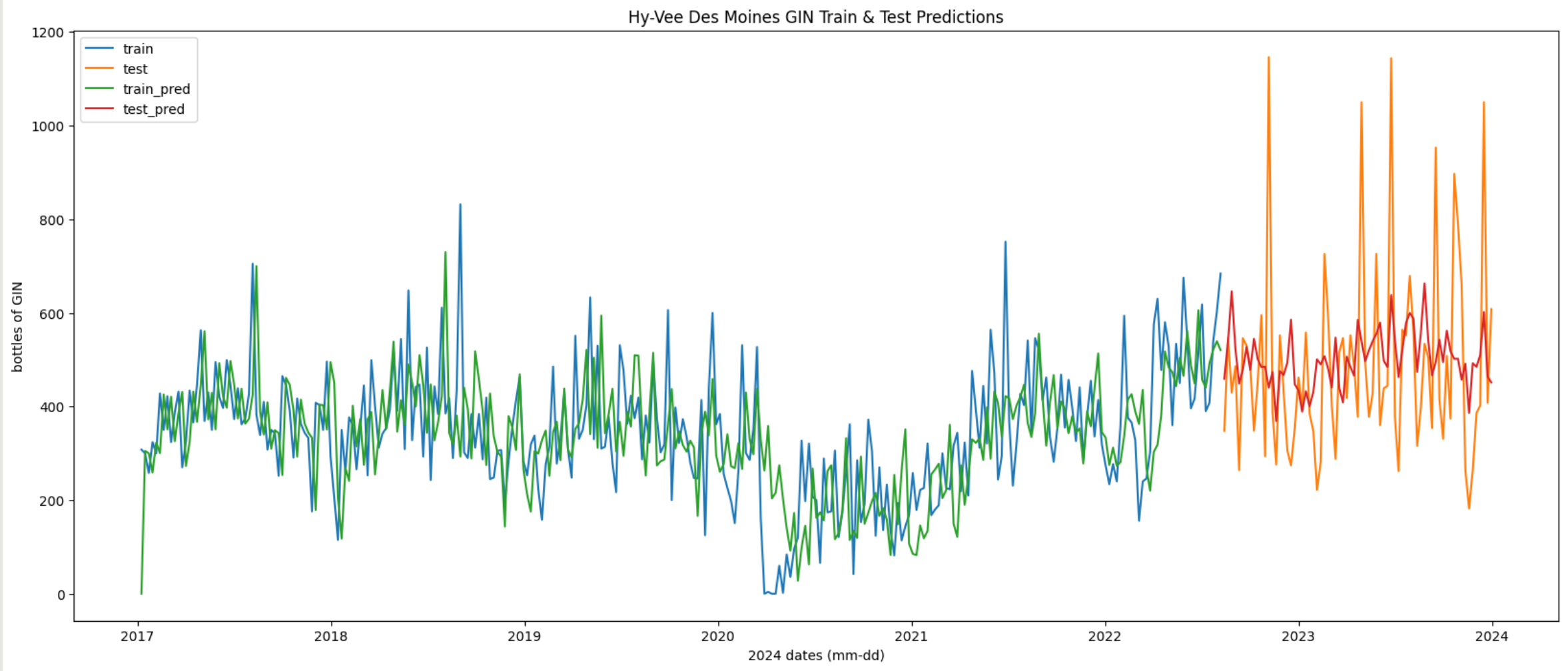
bourbon

forecast for 2024



gin

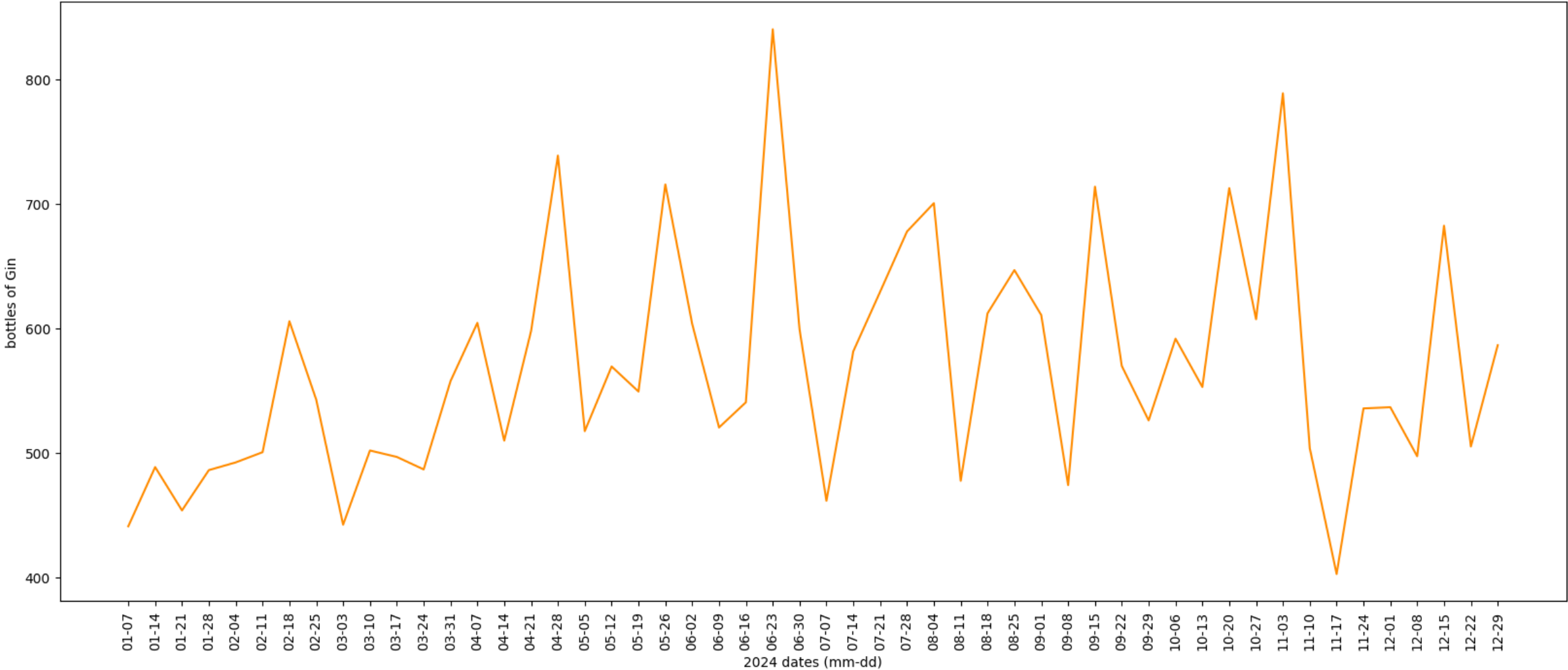
train & test set predictions



gin

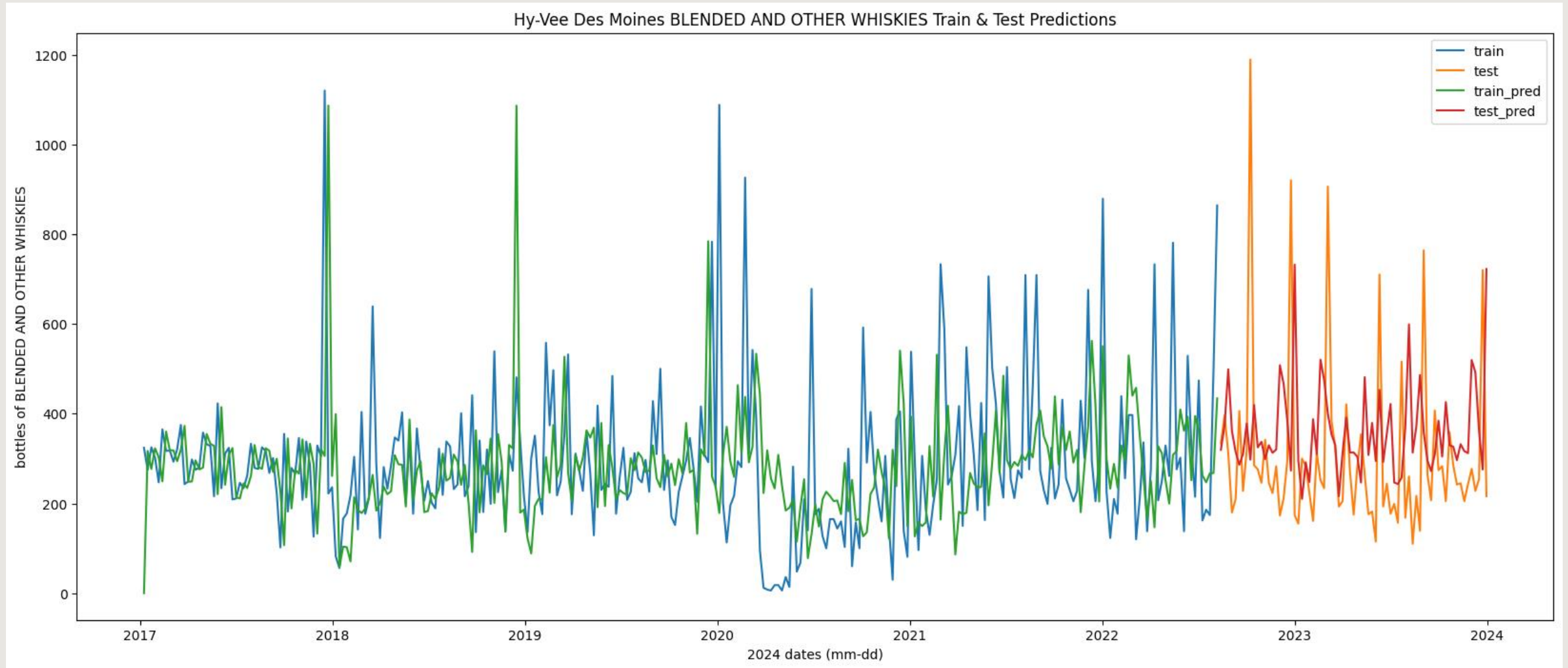
forecast for 2024

Hy-Vee Des Moines Gin Inventory Forecast for 2024



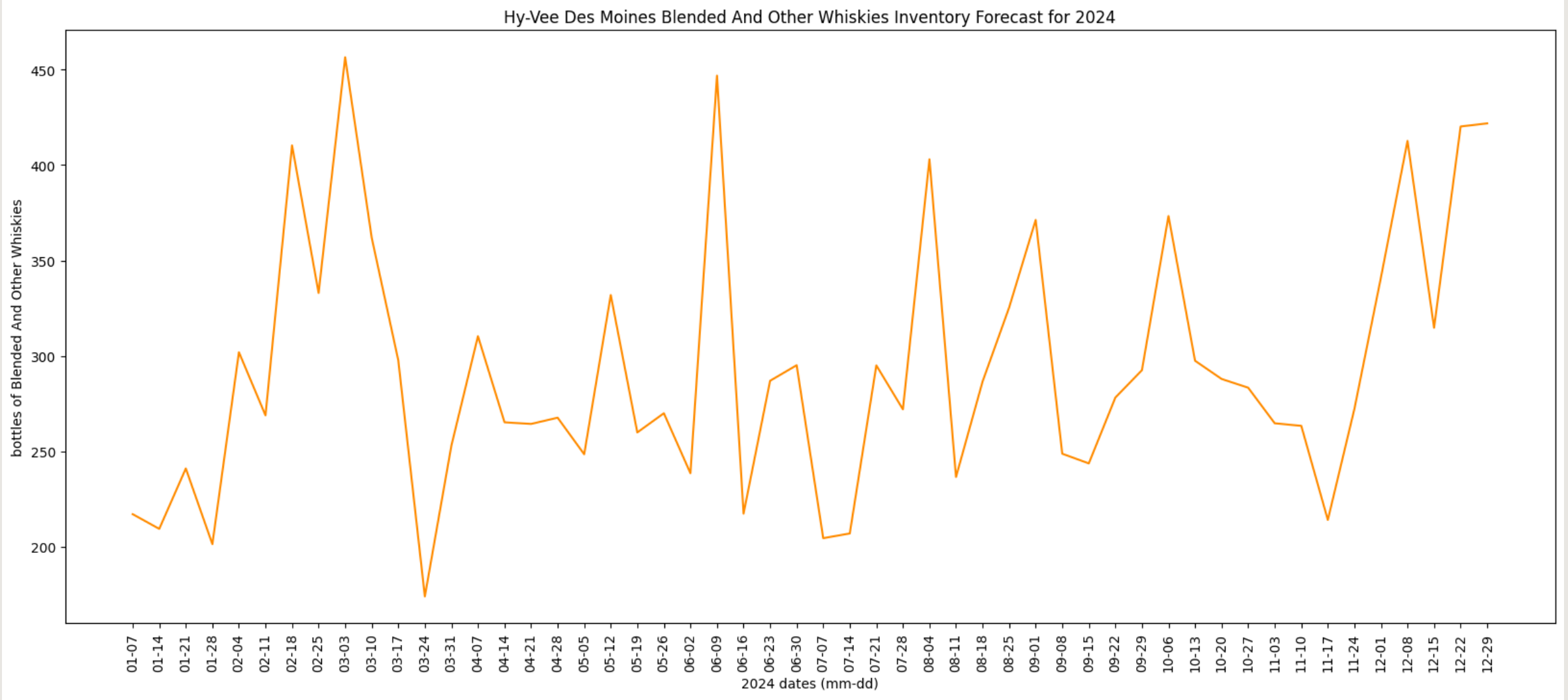
# blended & other whiskies

train & test set predictions



# blended & other whiskies

forecast for 2024



# MODEL EVALUATIONS

category model	test RMSE	# of bottles sold
all categories	4079.8	132,822
flavored vodka	334.7	23,229
liqueur	768.4	19,167
tequila	877.8	14,833
rum	1031.7	13,019
non-flavored vodka	3145.3	11,507
bourbon	303.1	9,195
gin	200.9	6,753
blended & other whiskies	232.4	5,893





Thank You



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