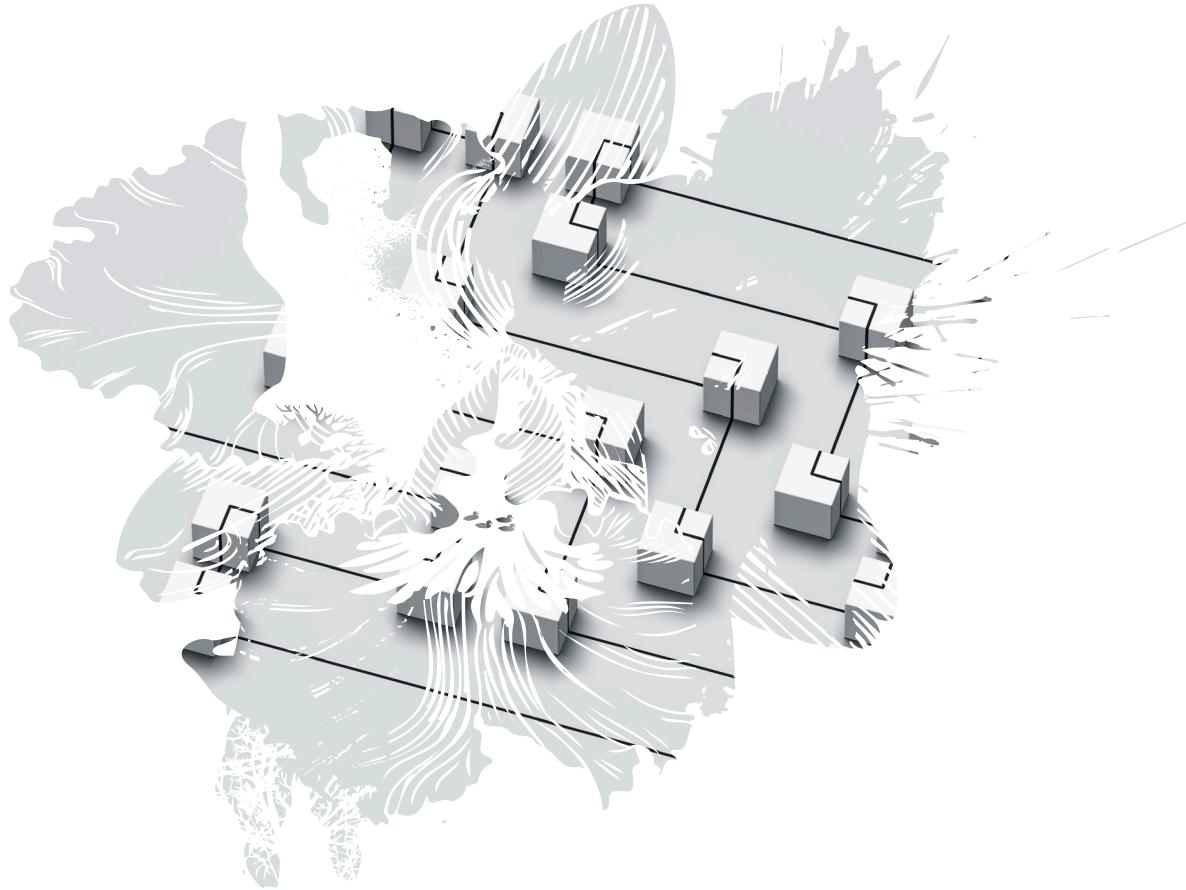




By: Amir
Dehbozorgi

Financial Action



The Challenge

Why do so many financial applications and workbooks fail to change someone's spending habits?

Hypothesis

I believe that these applications fail to provoke action. Without crossing over into the boundaries of rewards and consequences, I asked, what information can you provide to cause change in someone's spending habits?

Prophet

Prophet follows the sklearn model API. Where it creates an instance of the prophet class and then call its fit and predict methods. This method allowed me to use machine learning to forecast individual spending data to see the past and potential future trends.



The Code



What data was I using?

I used myself as an example:

- » Downloading my credit card data and using that as my sample to forecast into the future using Prophet.

	Date	
1	12/31/2019	95.6
2	12/29/2019	278.95
3	12/29/2019	1.42
4	12/26/2019	7.99
5	12/19/2019	33.35
6	12/18/2019	550
7	12/16/2019	44.09
8	12/16/2019	17.52
9	12/16/2019	67.57
10	12/15/2019	7.99
11	12/15/2019	74.99
12	12/15/2019	7.71
13	12/15/2019	4.79
14	12/14/2019	164.92

» 2019

121	9/26/2020	
122	9/26/2020	13.
123	9/26/2020	158.68
124	9/24/2020	20.7
125	9/21/2020	12.99
126	9/20/2020	21.76
127	9/20/2020	93.43
128	9/16/2020	37.42
129	9/13/2020	105.89
130	9/12/2020	100.18
131	9/12/2020	14.99
132	9/7/2020	91.98
133	9/6/2020	97.98
134	9/5/2020	24.12
135	9/5/2020	36.48
	9/5/2020	75.46

» 2020

8	7/22/2021	
9	7/20/2021	2
10	7/18/2021	91.75
11	7/17/2021	147.42
12	7/17/2021	232.77
13	7/16/2021	10.5
14	7/16/2021	114.18
15	7/15/2021	1
16	7/15/2021	1.25
17	7/15/2021	74.13
18	7/14/2021	14.99
19	7/14/2021	130
20	7/14/2021	20.8
21	7/13/2021	280.32
22	7/12/2021	70.28
23	7/12/2021	29.34

» 2021

Sorting/Cleaning

#Load date in from CSV file

```
df_2019 = pd.read_csv("../Project_2/2019.csv")
df_2020 = pd.read_csv("../Project_2/2020.csv")
df_2021 = pd.read_csv("../Project_2/2021.csv")
```

#combined all data into one data set

```
df = pd.concat([df_2019,df_2020,df_2021])
```

df.columns

```
Index(['Date', 'Amount'], dtype='object')
```

#change the column names to "ds" and "y" for the following steps using Prophet

```
df = df.rename({"Date": "ds", "Amount": "y"}, axis='columns')
```

df.columns

```
x(['ds', 'y'], dtype='object')
```

forecast = m.predict(future)

forecast[['ds', 'yhat', 'yhat_lower', 'yhat_upper']].tail()

ds	yhat	yhat_lower	yhat_upper
----	------	------------	------------

```
822 2022-07-23 187.282406 -16.587652 377.241027
```

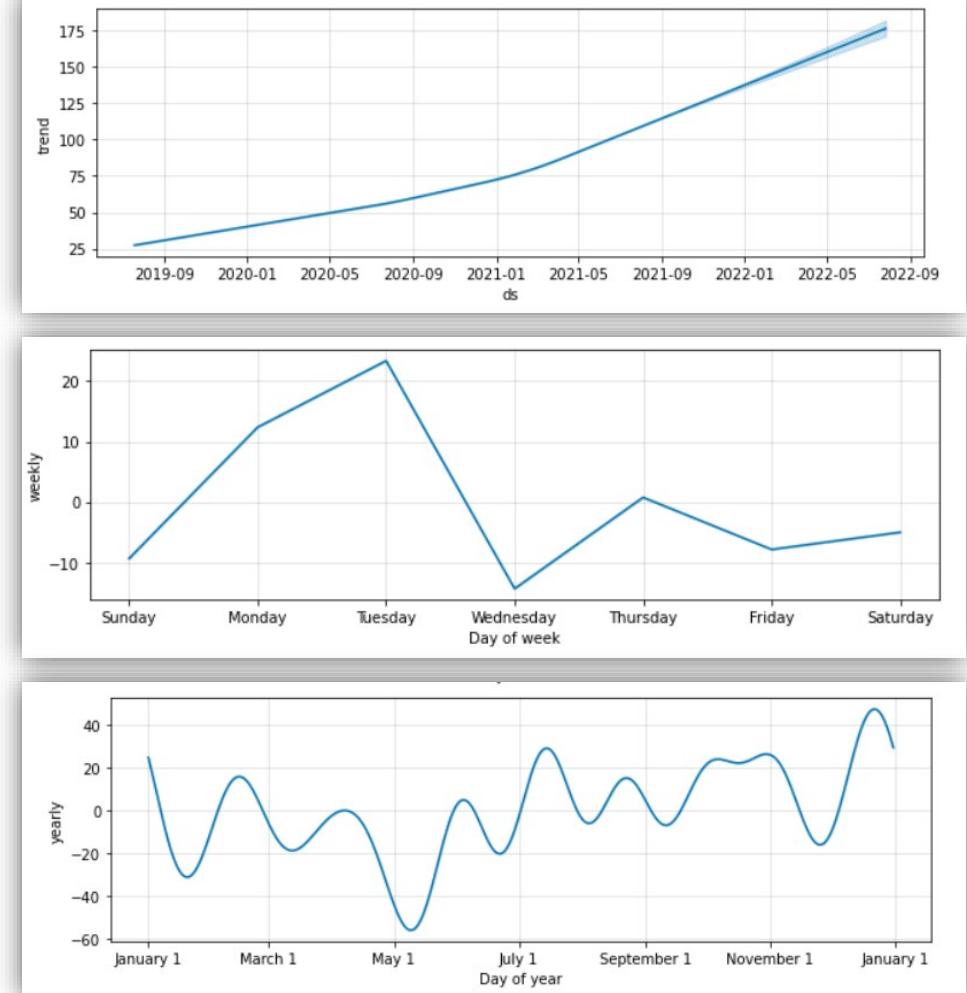
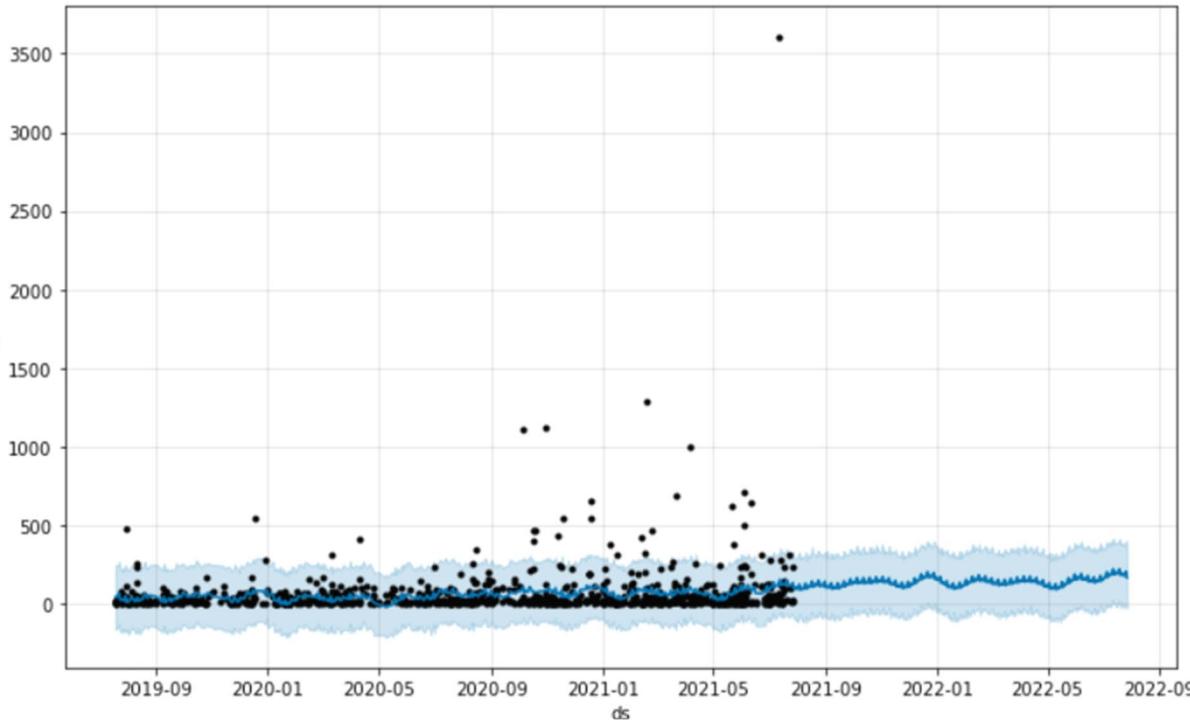
```
823 2022-07-24 180.512292 -22.444612 372.226434
```

```
824 2022-07-25 199.713521 -1.737237 391.475839
```

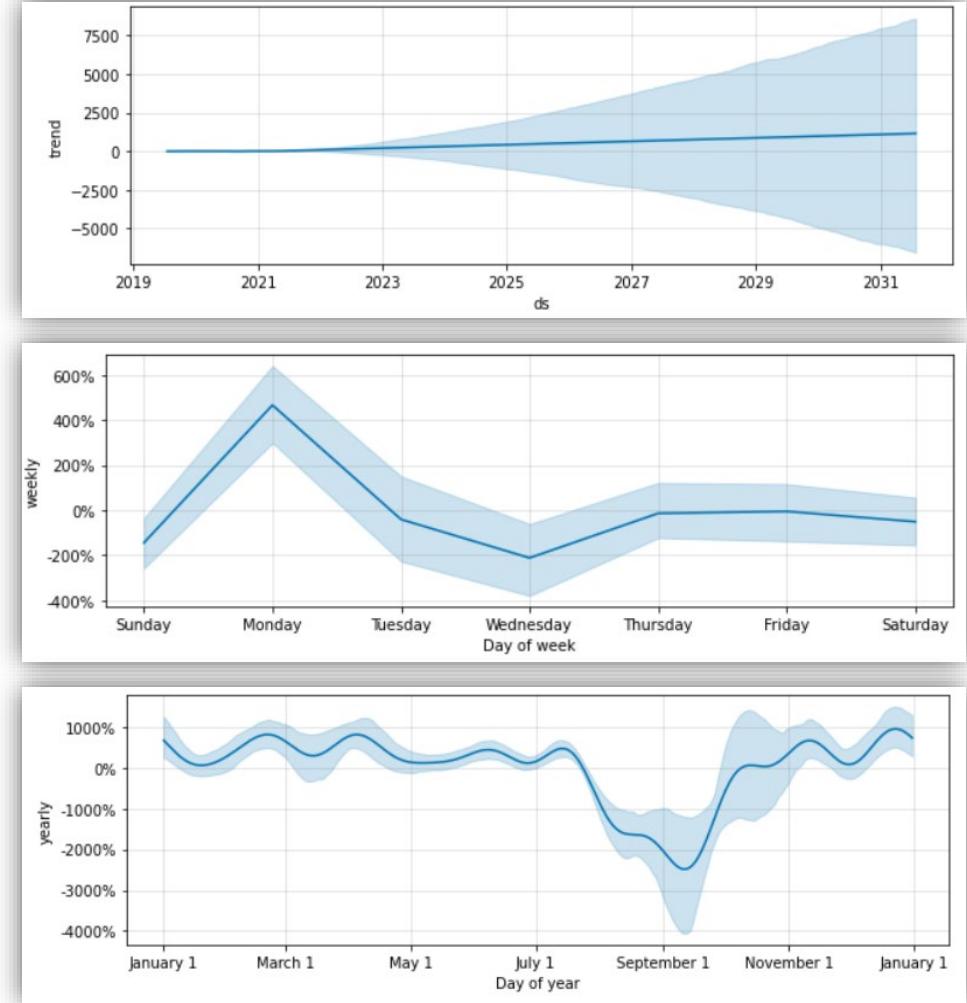
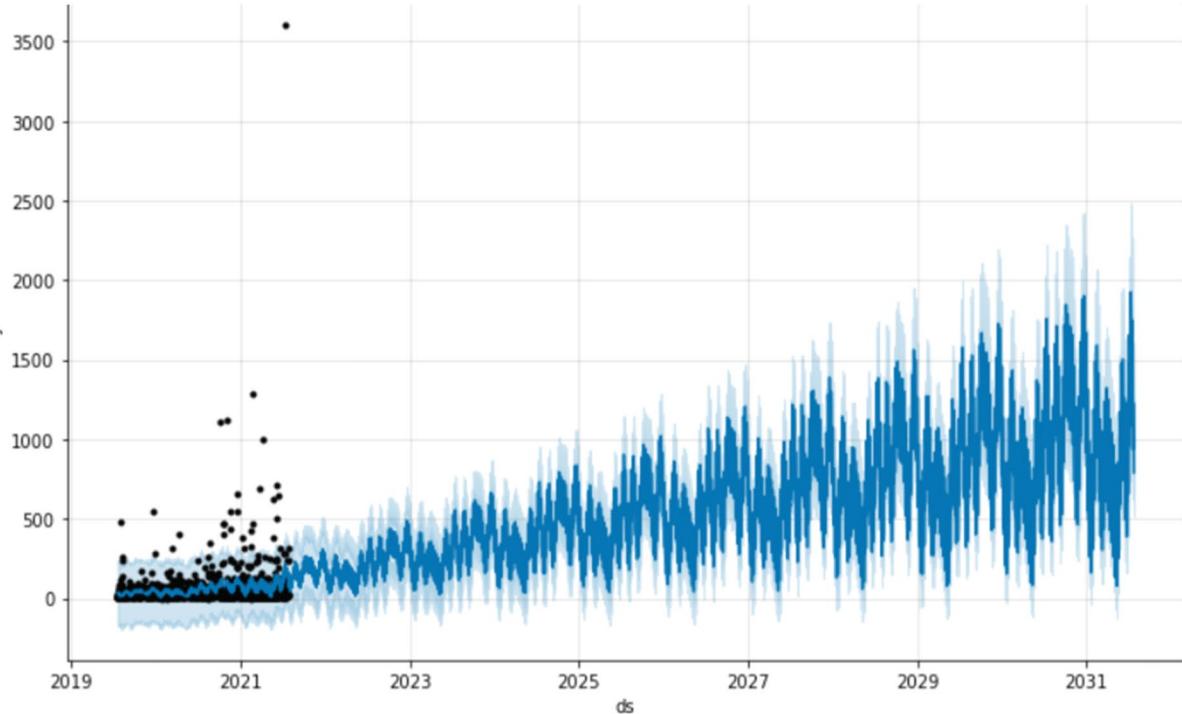
```
825 2022-07-26 208.240835 2.662456 407.799216
```

```
826 2022-07-27 168.196381 -25.329138 378.215314
```

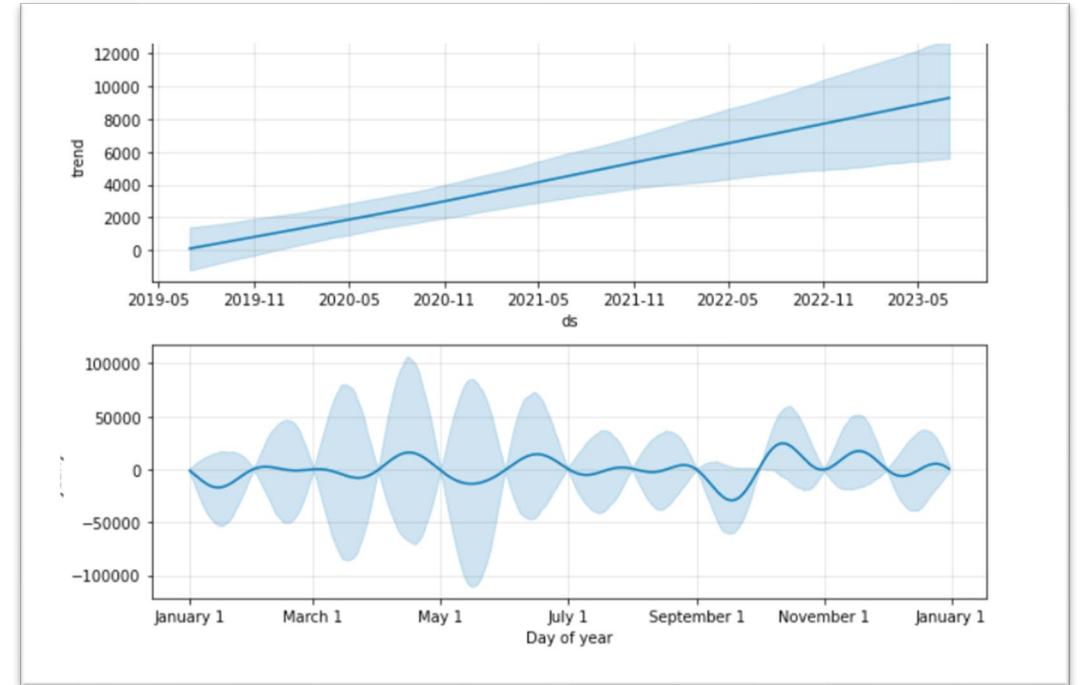
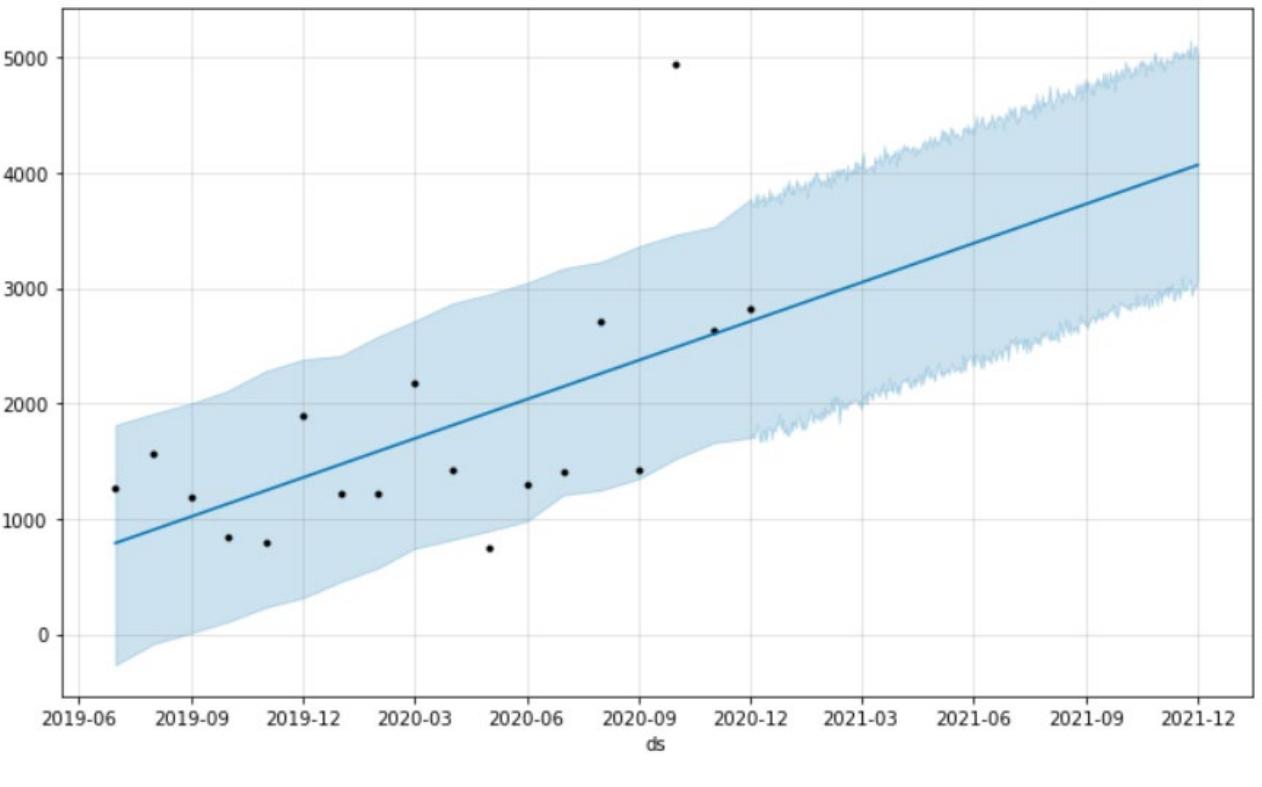
Forecasting out 1 year



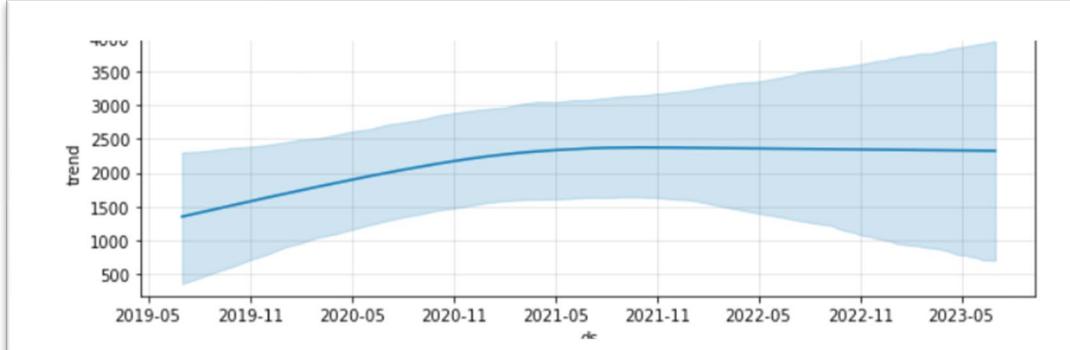
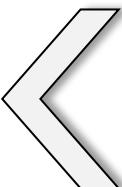
Forecasting out 10 years



Forecasting Monthly Data



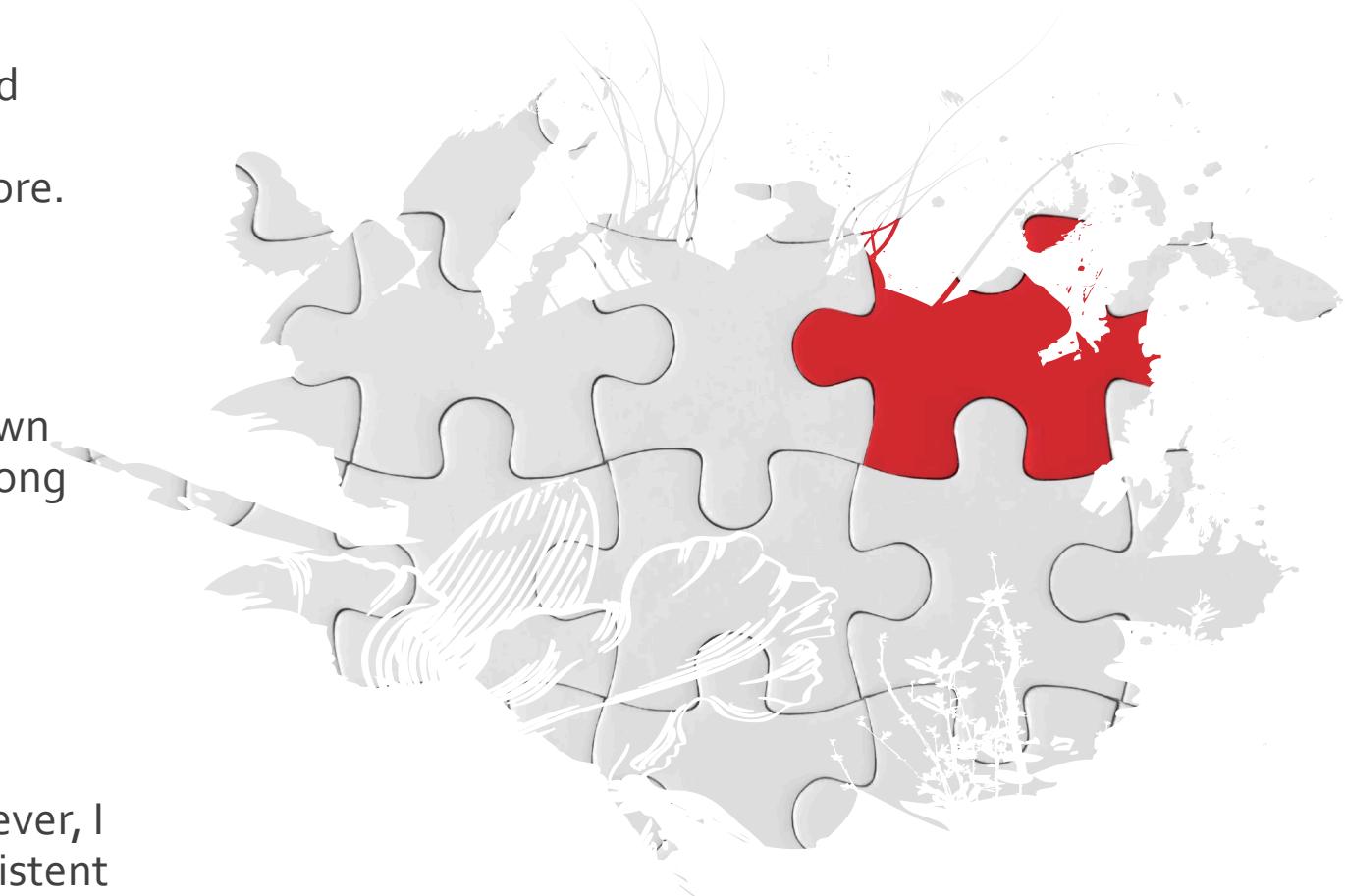
*Used 12 months of fake data to see
if I can change the trend*



Conclusion

Was this information useful?

- » I found this information to be very interesting and useful. It allowed me to dissect my own personal spending trends and highlighted when I spent more.



Could I understand the trend?

- » Yes, seeing the full forecasted model broken down into daily and weekly information gave me a strong understanding of the different trends.

Did it cause a change in me?

- » It's hard to say, it did provoke me to be more conscious of my spending on certain days. However, I don't think this alone is enough to create a consistent change. I believe this is one part but needs additional information and data to fully change someone's spending habits.

If I had more time and money?

What else would I do:

- » I'd do more research on the different financial applications out there to see the range of information provided. What data are they showing and is it enough to provoke change?
- » I'd build out an additional feature that could track your forecast and calculate daily spending limits. This would create specific daily numbers to show what amounts will either decrease, increase, or maintain the current trend they are on.
- » I would fund a project to build out a web application that created a financial workbook that displayed information and data with the intention of creating a change in spending habits.



The End

Thank You

