Retail Store Price Optimization

Many businesses, Stores and malls tends to use the power of data when they start pricing their products, From the valuable insights that we can gain or from the different machine learning algorithms that we can use we can get the best pricing plan to gain the maximum profit possible and this is the “**Price Optimization**”.

You can access the dataset that we used in our work from here [Retail Store Prices Data]

Our dataset contains many products and their categories, unit price, shipping price and the pricing of our products compared to the competitors and many more features here is a summary of the features that we have in our data.

1. **product_id** : The id of the product.
2. **product_category_name** : The category that the product belongs to.
3. **month_year** : The date in which the order is made.
4. **qty** : quantity sold from the product.
5. **total_price** : total price of the order unit_price*qty.
6. **freight_price** : The average price for shipping the order.
7. **unit_price** : The price of one unit.
8. **product_name_lenght** : The length of the product name.
9. **product_description_lenght** : The length of th product description.
10. **product_photos_qty** : Number of photos available for the product.
11. **product_weight_g** : Product weight in grams.
12. **product_score** : Average product score.
13. **customers** : Number of customers that ordered this product.
14. **weekday** : Number of weekdays in that month.
15. **weekend** :Number of weekend days in that month.
16. **holiday** : Number of days considered as holiday in that month.
17. **month** : The month of the order.
18. **year** :Year of the order.
19. **s** : It represents the Seasonality which is in short represent how much the demand is for the given product in a season.
20. **volume**: The volume of the product.
21. **comp_1**: The price of the product for the first competitor.
22. **ps1** : The product score for the first competitor.
23. **fp1** : The product freight price for the first competitor.
24. **comp_2** : The price of the product for the second competitor.
25. **ps2** : The product score for the second competitor.
26. **fp2** : The product freight price for the second competitor.
27. **comp_3** : The price of the product for the third competitor.
28. **ps3** : The product score for the third competitor.
29. **fp3** : The product freight price for the third competitor.
30. **lag_price** : The price of the product in the previous month.

Here is the description of our data. Now let’s check the notebook and see how benefit it was.

After checking and understanding the features and after dealing with columns names it is the time to extract the valuable information from our data.

What are the questions we are trying to answer here or what can we do with this data?

1)What are the top products that we have?

2)What are our top categories?

3)What are the most in demand products and categories in each year and month?

4) What are the products with the most quantity sold?

5)What are the most expensive products that we have?

6)Is the pricing distribution and product ratings for us better than all the competitors?

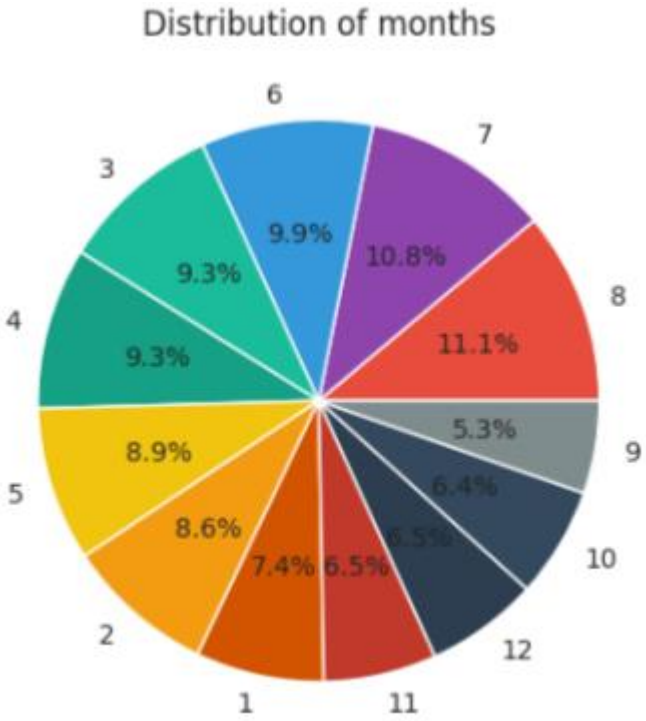
7)What year and months have the most sales?

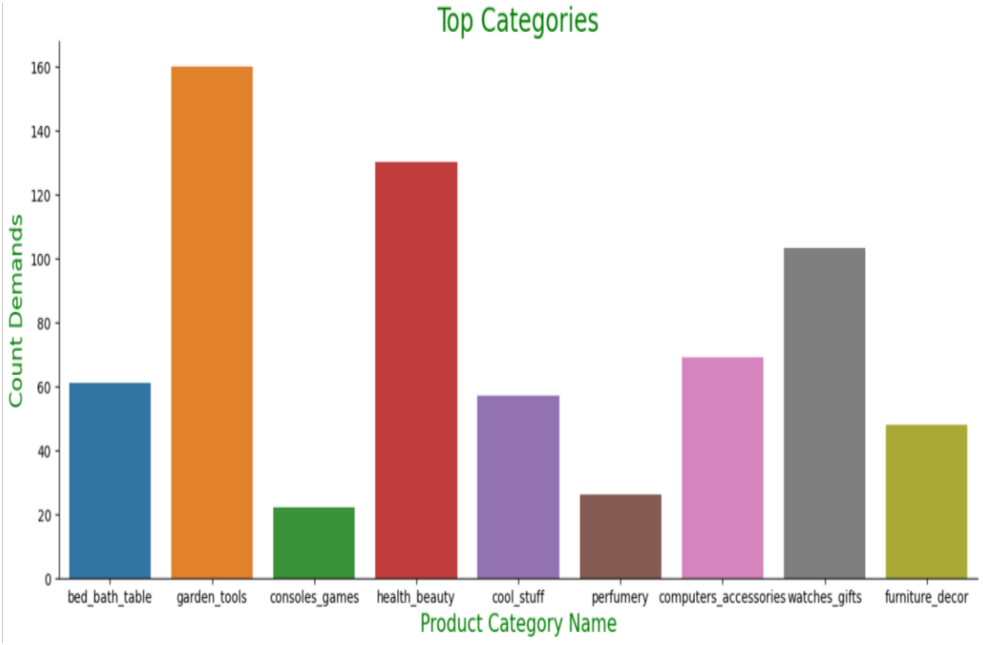
8)How do the prices affect the customers?

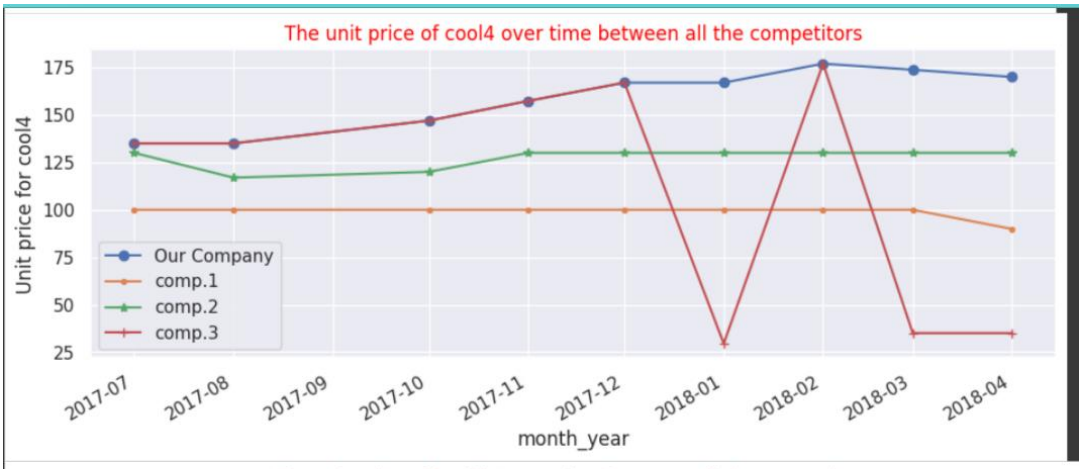
9)How can different stuff affect the product scores?

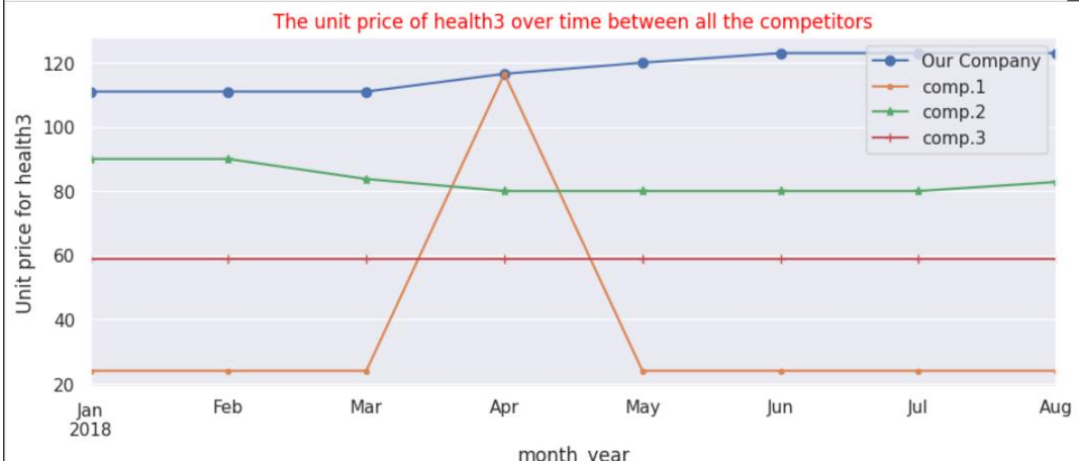
10)How are the prices of our products change every month and comparing the prices to all the competitors.

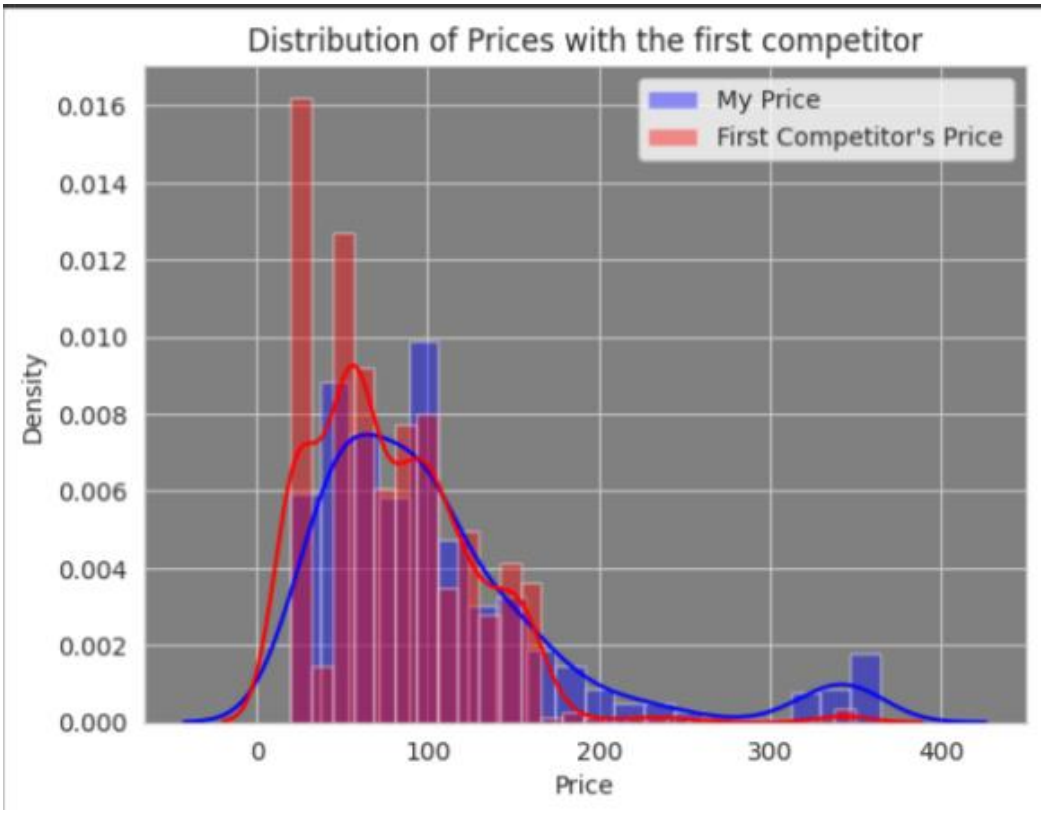
Some of the visualizations we can see in the notebook that answer all these questions.

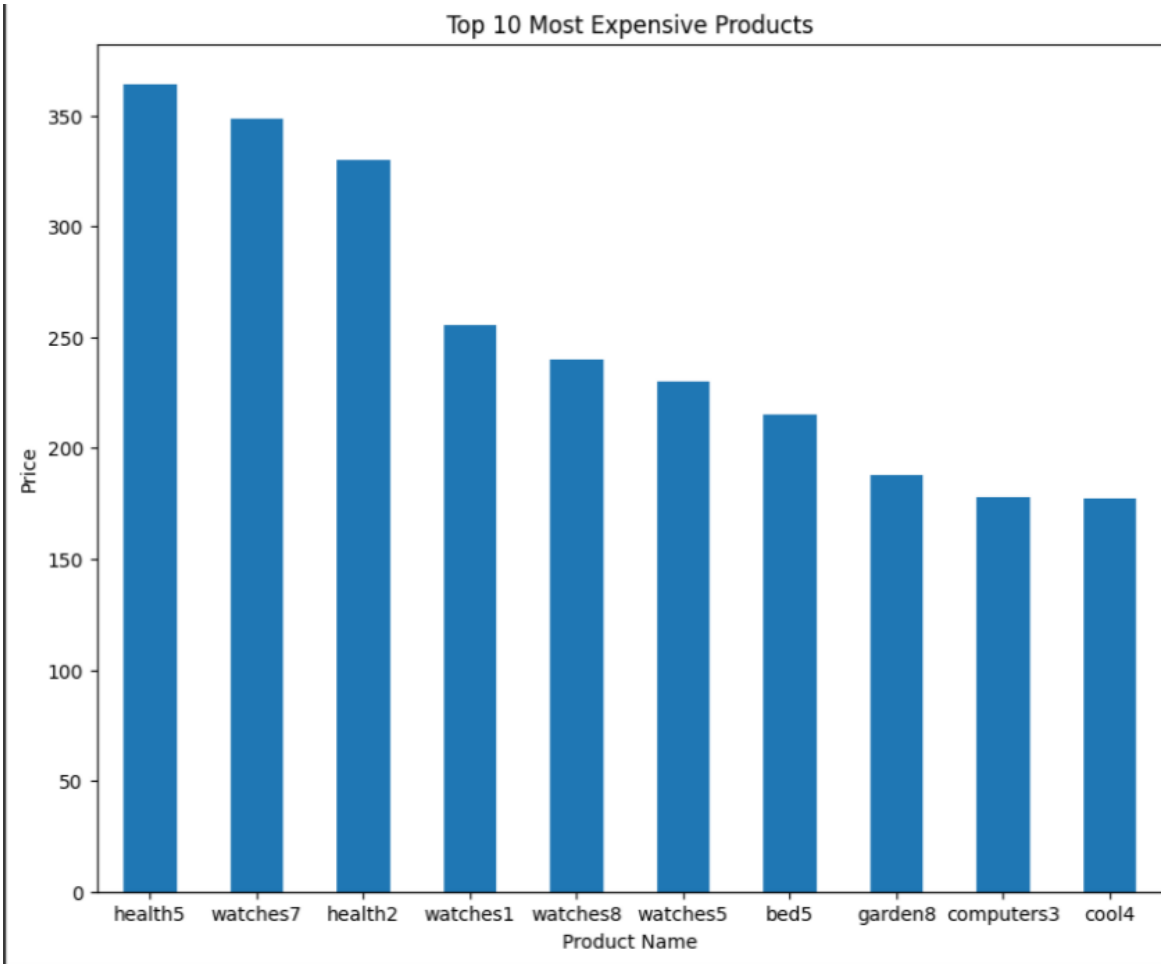


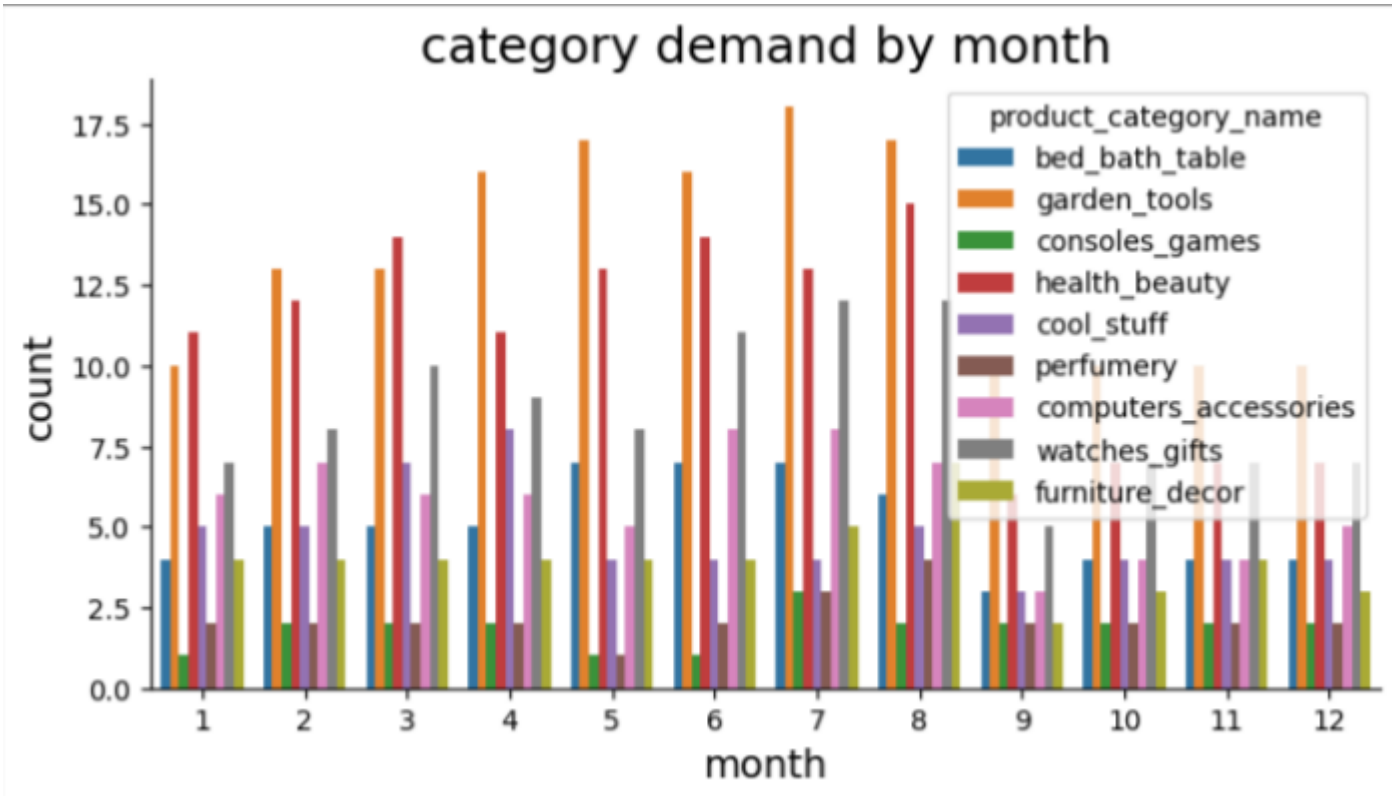

Top Categories
Count Demands
160
140
120
100
80
60
40
20
0
bed_bath_table
garden_tools
consoles_games
health_beauty
cool_stuff
perfumery
computers_accessories
watches_gifts
furniture_decor
Product Category Name


The unit price of cool4 over time between all the competitors
Unit price for cool4
175
150
125
100
75
50
25
Our Company
comp.1
comp.2
comp.3
2017-07
2017-08
2017-09
2017-10
2017-11
2017-12
2018-01
2018-02
2018-03
2018-04
month_year


The unit price of health3 over time between all the competitors
Unit price for health3
120
100
80
60
40
20
Our Company
comp.1
comp.2
comp.3
Jan
2018
Feb
Mar
Apr
May
Jun
Jul
Aug
month_year


Distribution of Prices with the first competitor
My Price
First Competitor's Price
Density
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0
100
200
300
400
Price


Top 10 Most Expensive Products
Price
350
300
250
200
150
100
50
0
health5
watches7
health2
watches1
watches8
watches5
bed5
garden8
computers3
cool4
Product Name



These are not the only visualizations available in the notebook there are many more and for each visualization you can see the insights we gain from it and that's how we can answer all our questions and with this we can get the perfect pricing for our products!

For a better look through our data, we used power bi to create an interactive dashboard that can help us even more with our pricing and here are the questions that we can answer from the dashboard.

1)Are we selling the product at a price that is better than our competitors'?

2)What are the most sold by quantity product and category?

3)What are the most sold products by year and by month?

4)What are the most expensive and the most rated (customers favorite) product overtime?

5)What are the most expensive and the most rated product of all time?

6)Products ratings compared to the competitors and shipping prices compared to the competitors.

Some of the visualizations we can see in the Dashboard that answer all these questions.

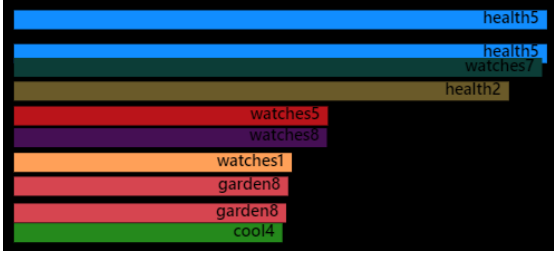
1

" Prices Compared to Competitors "

4

"Most expensive & Most Rated "

Top 10 Expensive products overtime



2

health5

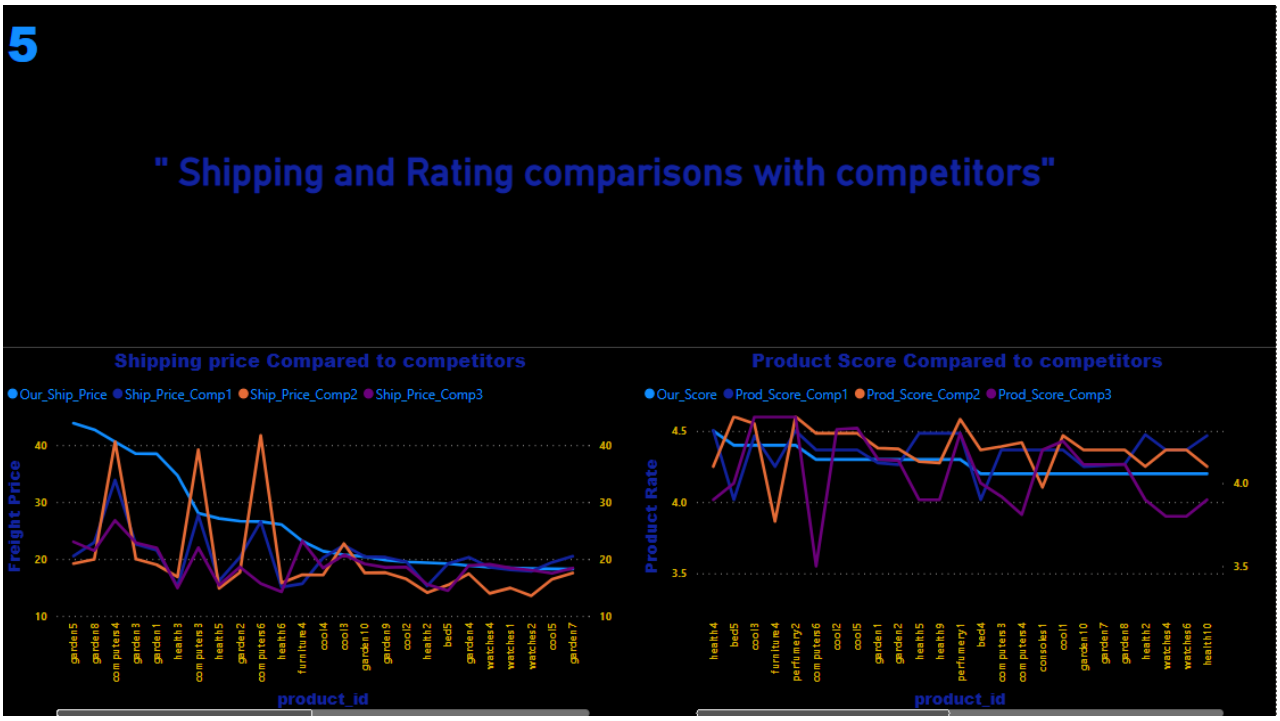
All Time most expensive

health4

All Time top Rated

Top 10 Rated Products overtime

2



The Power Bi & The notebooks will be in the same file with the documentation, and you can see all the findings and insights that gave us great information to optimize the prices and you can see the approaches we can take to do so in the notebook.

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