Performance Analysis of Nike Stores

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In this project, I processed the Nike stores' KPI data. By using historical comparison, growth analysis, structural analysis and other methods, I analyzed the Nike stores' performance in multiple dimensions, like brand, store type, division, gender. The raw data is provided by Nike in 2020 and is modified for interview test. And the raw data won't be shared to others.

Contents

Business Question Overview

There are two sheets in the excel file: **'Door Info'** and **'Sale Info'**.

The **'Door Info'** contains the daily data of 2017/8/14-2017/8/20 and 2016/8/14-2016/8/20.
Attributes are **Store No.,Store Type**, **Date**, **# Traffic**, **# Transaction**, **$ Sales Amount**, **# Sold Unit**.

I mainly applied historical comparison, growth analysis and structural analysis to analyze the brand's weekly performance in three dimensions: **Brand**, **Store Type**, **Store**.

The **'Sale Info'** contains the yearly data of 'this year' and 'last year'.

Attributes are **Store No.**, **Division**, **Gender**, **Product No.**, **SALES**, **UNITS**, **INVENTORY**, **INVENT UNIT**.

I used the similar methods to analyze the brand's yearly performance in five dimensions: **Brand**, **Division**, **Gender**, **Product**, **Store**.

The whole business commentary will be in two parts based on the two sheets. I used Excel to process and present the data.

Data Cleaning

1. Missing Value

From the sheet of **'Door Info'**, I found a gibberish:

A002	FLAGSHIP	2017/8/15	1295	161	QAWERTYUIOP[]\

This is a **$ Sales Amount value.**

I calculated the sum of store A002's Sales Amount and the sum of A002's SOLD Unit in 2017 (except for the day of 2017/8/15), and used the average of Sales price multiple SOLD Unit of 2017/8/15 to replace the gibberish.

2. Abnormal situation

From the sheet of **'Door Info'**, in the data of the last year, I found It's abnormal that #Traffic=0 while #Transaction>0. I used (Traffic per Transaction) * Transaction to adjust Traffic

Data Analysis Part I

This part is based on the 'Door Info' sheet. We analyze on a daily or weekly base.

1. Brand's Overall Performance

I summed up the data of the week of 8/14 - 8/20 of 2017 and 2016, the results show as below:

Brand Overall Performance						
Years	# Traffic	# Transaction	%Transaction/Traffic	$ Sales Amount	# Sold Unit	$ Average Price
2017	533286	28895	5.42%	1853185.4	33551	55.2
2016	332389	13759	4.14%	897322.7	19247	46.6
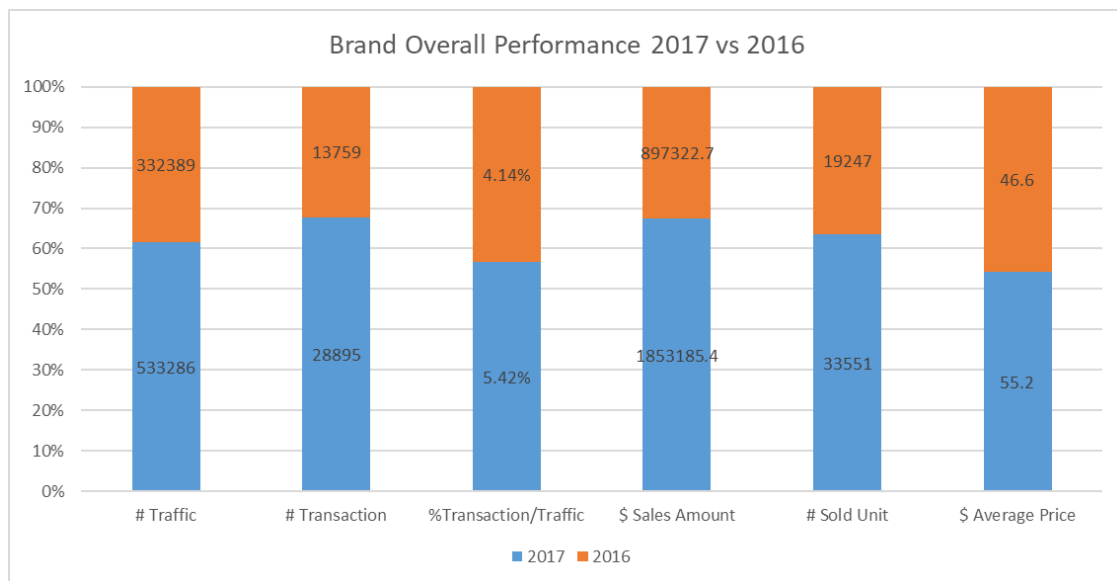
From the above results we can find every attribute of 2017 is higher than 2016. This shows the overall performance of Nike Brand improved.

The increase of %Transaction/Traffic ratio indicates that customers who enter the store are more likely to buy goods. This may be due to the improvement of the service of the staff or the improvement of the product quality.

We can also find that the average price of products increased, but the sales volume has not decreased, which shows that Nike has good user stickiness and the brand is developing well.
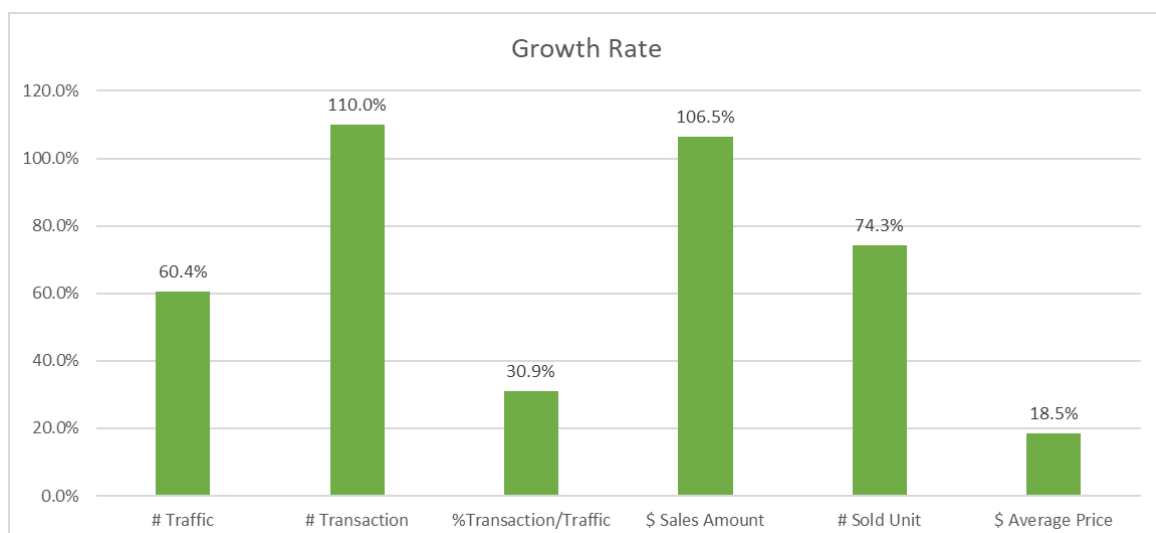
From the table of the Growth Rate, we can find #Transaction has the highest growth rate, which indicates the increase of purchase is the main reason of Nike's development.

I also summed up the #Transaction of each date.
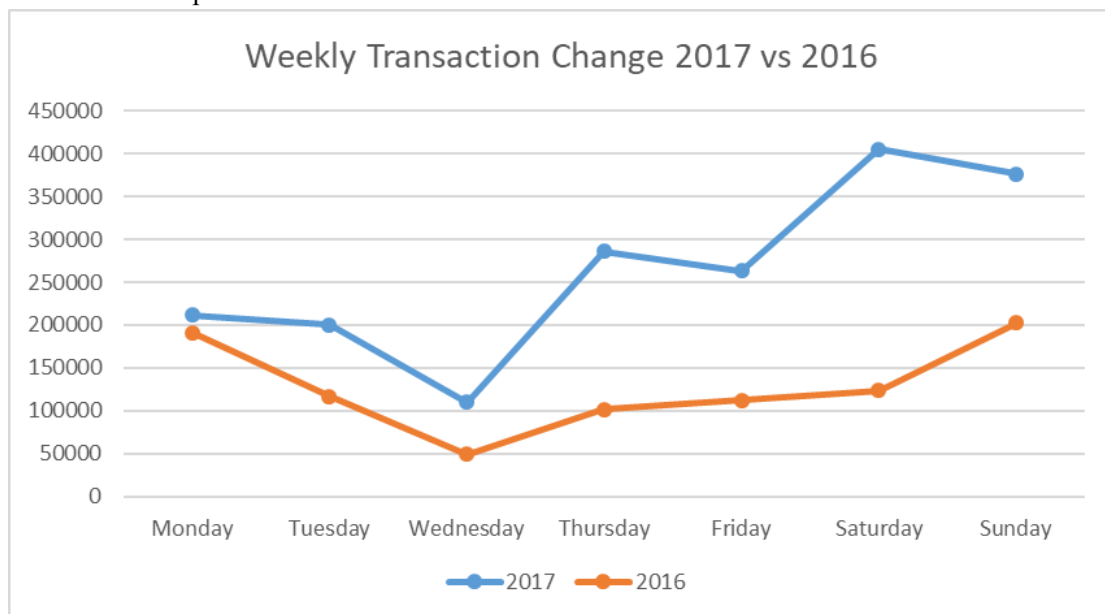
We can find people are more likely to purchase Nike's products on weekends, and less likely on Wednesday, this is pretty understandable.

2. Store Types' Overall Performance

The amounts of each type of store are showed as below.

Store Type	Store amounts in 2017	Store amounts in 2016
BASKETBALL	1	0
FLAGSHIP	14	6
JORDAN	2	2
KIDS	6	4
LIFESTYLE	6	6
MASSIVE STORE	6	6
RUNNING	3	2
SNEAKER	6	1
SPORT PERFORMANCE	27	22
sum	71	49

We can find that for both years, SPORT PERFORMANCE stores make up the majority.

These was a new BASKETBALL store opened in 2017.

The number of SNEAKER stores and FLAGSHIP stores has grown rapidly, with growth rates of more than 100%.

I summed up the $ Sales Amount of each type of store. Let's take a look at the composition of sales amount.

| Store Type	$ Sales Amount	% percentage
FLAGSHIP	806539.2503	44%
SPORT PERFORMANCE	566882.1429	31%
SNEAKER	123351.5714	7%
MASSIVE STORE	90835.14286	5%
LIFESTYLE	67162.71429	4%
KIDS	62828.85714	3%
RUNNING	56826.57143	3%
BASKETBALL	49172.28571	3%
JORDAN	29586.85714	2%

% percentage shows the sales amounts of each store as a percentage of the total sales amounts.
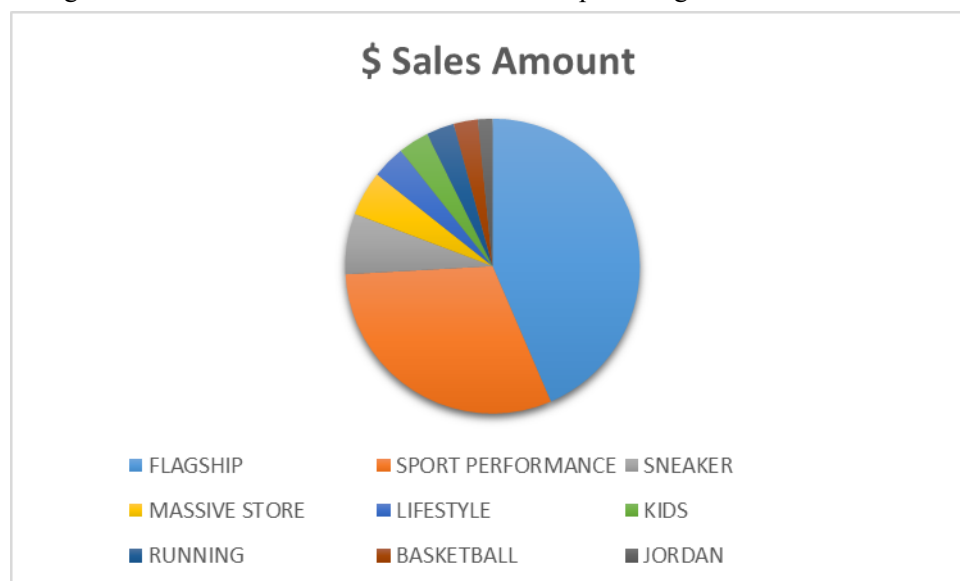
We can find that the sales amounts of FLAGSHIP and SPORT PERFORMANCE stores take around 75% of the total sales amounts. They are the main contributors to sales amounts.

For the growth rates of each type of stores' sales amounts,

Store Type	Sales Amount Grouth Rate
SNEAKER	3013.37%
FLAGSHIP	161.84%
KIDS	124.99%
SPORT PERFORMANCE	83.46%
RUNNING	24.64%
MASSIVE STORE	7.35%
LIFESTYLE	-17.52%
JORDAN	-19.57%

Sales Amount Growth Rate
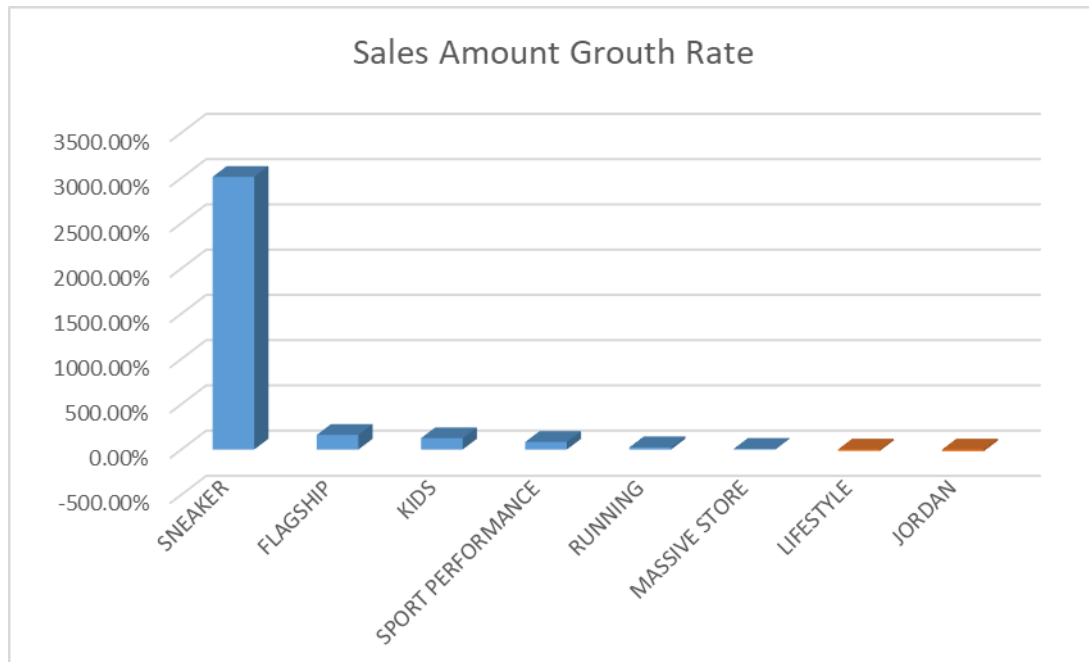
SNEAKER stores and FLAGSHIP stores has grown rapidly, this is mainly due to the opening of many new stores. KIDS and SPORT PERFORMANCE stores also grown pretty fast. This may be due to the increase in the number of stores, the increase in people's consumption ability and the change of life style.

The sales amounts of LIFESTYLE and JORDAN decreased. As we known, the amounts of these two types of store stayed the same. We need more information to find the results of decreasing.

3. Stores' Overall Performance

I summed up the attributes of each store. Here are the statistical values of each variable over the two years.

Stats Variables	# Traffic	# Transaction	$ Sales Amount	# Sold Unit
2017				
mean	7511.07	406.97	26101.20	472.55
Standard Error	1519.12	70.61	5725.23	93.22
median	4992.00	288.00	15617.57	327.00
std	12800.36	594.99	48241.68	785.51
kurtosis	56.24	43.32	51.30	47.53
skewness	7.14	6.03	6.74	6.41
min	395.00	0.00	0.00	0.00
max	108087.00	4798.00	396850.43	6400.00

Stats Variables	# Traffic	# Transaction	$ Sales Amount	# Sold Unit
2016				
mean	6783.45	280.80	18312.71	392.80
Standard Error	1882.29	62.02	5014.26	100.25
median	4298.00	204.00	9960.14	245.00
std	13176.04	434.12	35099.80	701.76
kurtosis	37.93	34.25	37.27	36.15
skewness	5.92	5.50	5.83	5.71
min	1080.00	0.00	0.00	0.00
max	91799.00	3017.00	243953.57	4872.00

First of all, these the means of data reflect the growth trend mentioned above.

And we can find the attributes have high variation or dispersion and are heavy-tailed and not symmetrically distributed. This shows that there are great differences between different stores.

A minimum of zero may be due to the fact that some stores are not officially open.

I ranked these stores by # Traffic and $ Sales Amount for both years. Here are the TOP 5 and BOTTOM 5 stores based on different attributes and years.

rank	# Traffic	Store Type	$ Sales Amount	Store Type
2017				
1	A018	FLAGSHIP	A018	FLAGSHIP
2	A005	SPORT PERFORMANCE	A005	SPORT PERFORMANCE
3	A050	BASKETBALL	A009	FLAGSHIP
4	A052	SPORT PERFORMANCE	A002	FLAGSHIP
5	A065	FLAGSHIP	A065	FLAGSHIP
67	A042	RUNNING	A062	KIDS
68	A041	SNEAKER	A041	SNEAKER
69	A039	JORDAN	A039	JORDAN
70	A004	SPORT PERFORMANCE	A028	FLAGSHIP
71	A028	FLAGSHIP	A004	SPORT PERFORMANCE

2016				
rank	# Traffic	Store Type	$ Sales Amount	Store Type
1	A018	FLAGSHIP	A018	FLAGSHIP
2	A005	SPORT PERFORMANCE	A005	SPORT PERFORMANCE
3	A033	LIFESTYLE	A014	SPORT PERFORMANCE
4	A068	MASSIVE STORE	A013	RUNNING
5	A014	SPORT PERFORMANCE	A009	FLAGSHIP
45	A003	KIDS	A041	SNEAKER
46	A036	SPORT PERFORMANCE	A047	SPORT PERFORMANCE
47	A041	SNEAKER	A028	FLAGSHIP
48	A047	SPORT PERFORMANCE	A015	KIDS
49	A004	SPORT PERFORMANCE	A004	SPORT PERFORMANCE

First of all, the TOP 2 stores didn't change at all, they are of great significance to Nike brand.

The new BASKETBALL story is very popular, people visited it a lot in 2017. People like freshness and new concepts.

It's pretty strange that there are FLAGSHIP stores in the BOTTOM5, we need more information to find the reason.

Quantifiably, in 2017, the TOP5 stores take 38.23% of total sales amount, in 2016, 46.67%.

This decline is good, indicating that Nike's dependence on top stores has decreased. This is conducive to reduce operational risk and long-term development.
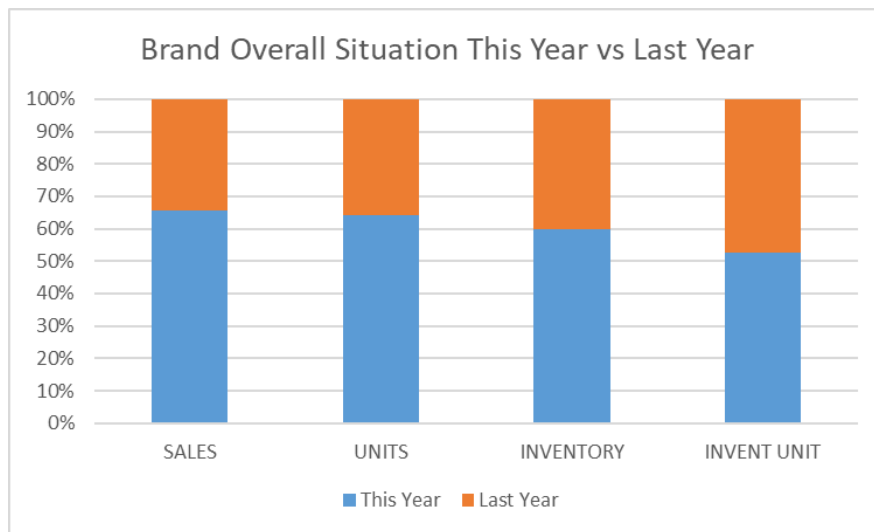
Data Analysis Part II

This part is based on the 'Sales Info' sheet. We analyze on a yearly base.

1. Brand's Overall Performance

Brand Overall Performance				
	SALES	**UNITS**	**INVENTORY**	**INVENT UNIT**
This Year	3240596	23934	41903410	278815
Last Year	1684607	13428	28194975	252129

Compare with last year, this year showed a rapid growth on every attribute. Size of SALES almost doubled.
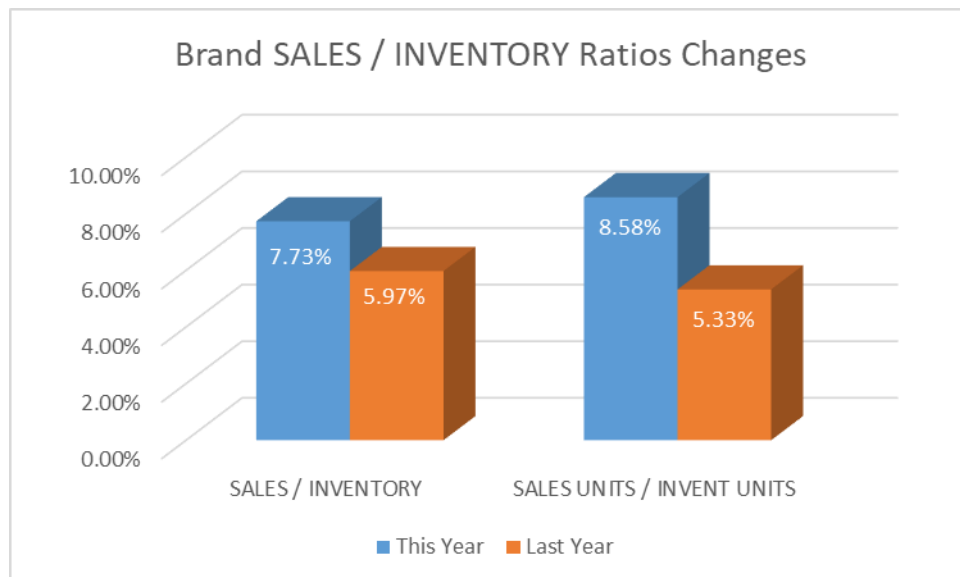
The ratios of SALES / INVENTORY and SALES UNITS / INVENT UNITS increased, which indicates that Nike improves its ability of selling inventories. This helps to improve liquidity and reduce risk.

2. Divisions' Overall Performance

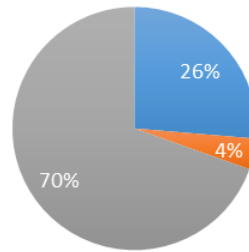Now, let's check out the divisions. I summed up the attributes of each division.

Structure Change				
Division	TY SALES	LY SALES	TY INVENTORY	LY INVENTORY
APPAREL	25%	26%	27%	26%
EQUIPMENT	3%	4%	3%	3%
FOOTWEAR	72%	70%	70%	70%

This year's SALES
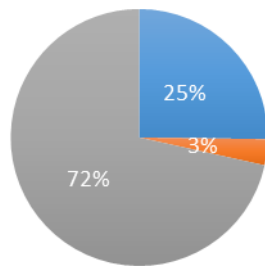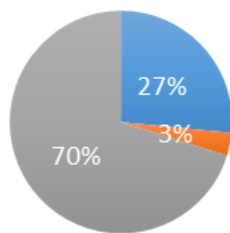
Last year's SALES

This year's INVENTORY


Last year's INVENTORY
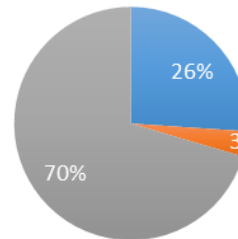
From the above results we can find that SALES and INVENTORY have similar division structure,
And the structure almost didn't change in two years.
FOOTWEAR division is of the most importance to Nike.

3. Genders' Overall Performance

Similarly, I summed up attributes by gender.

Gender	TY SALES	LY SALES	This year's SALES ratio	Grouth Rate
ADULT UNISEX	74913.15	58531.48	2%	28%
KIDS	240058.44	71499.66	7%	236%
MENS	1912597.38	1019347.37	59%	88%
WOMENS	1013027.35	535228.37	31%	89%
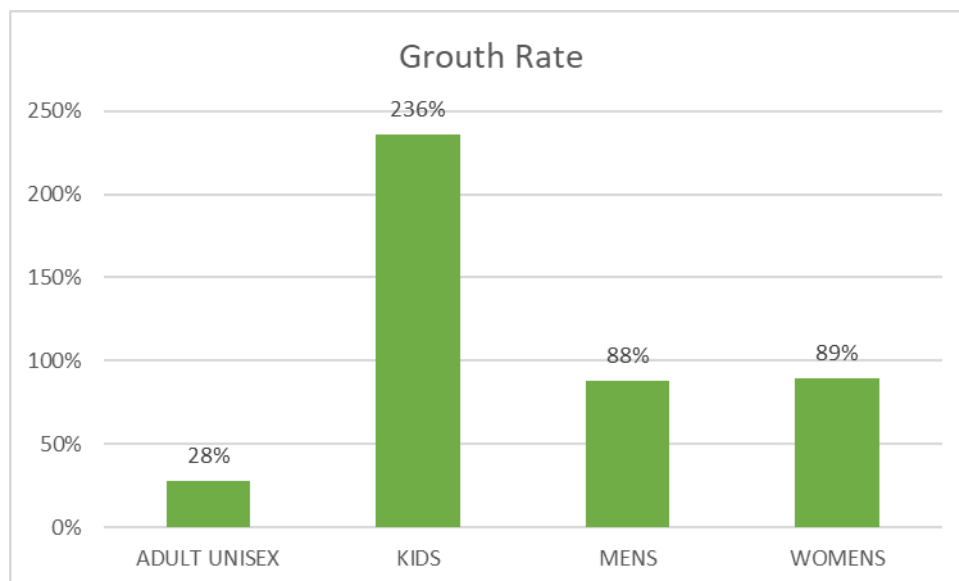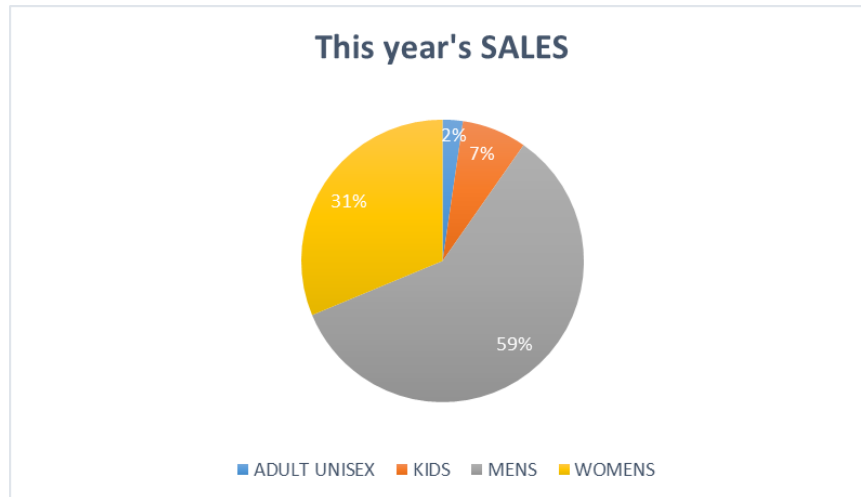
Considering 2017, MENS took the biggest part, but KIDS showed the incredible growth, This is similar to the results in the previous part.
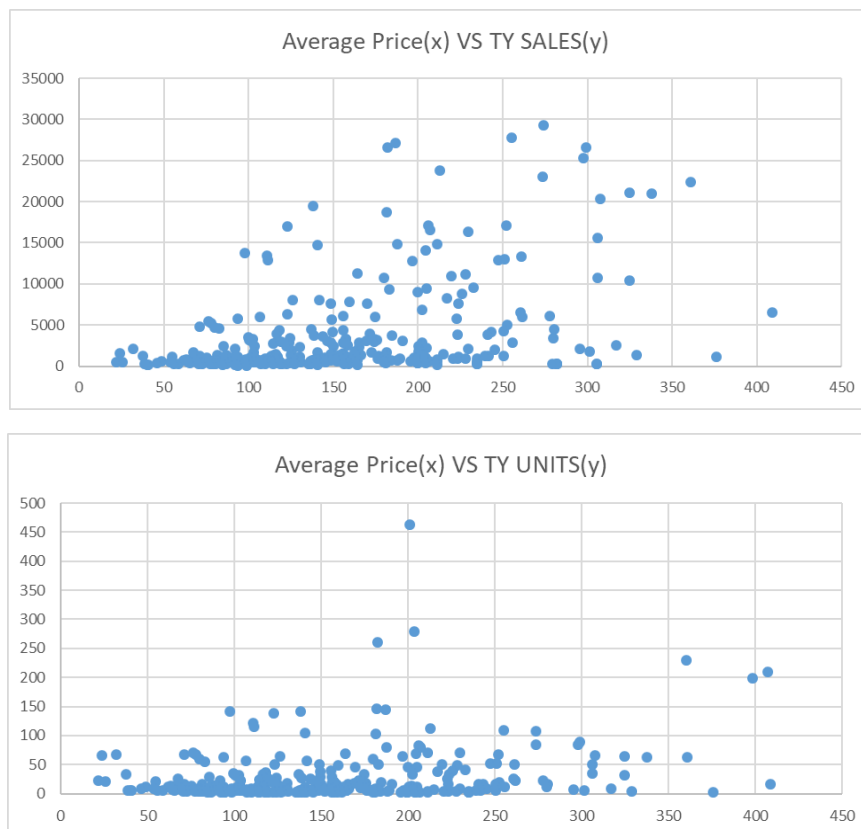
4. Products' Overall Performance

I ranked Products' performance by SALES of this year and last year, here's the results

Rank	Product No.	TY SALES	Product No.	LY SALES
1	SKU1887	93065.82	SKU0002	18660.21
2	SKU1560	85527.19	SKU0888	6870.244
3	SKU0049	82888.52	SKU0032	4452.216
4	SKU1561	78887.13	SKU0008	3309.496
5	SKU1888	56794.73	SKU0022	3183.243
sum		3240596		1684607
Top 5 sum		397163.4		36475.41
Ratio		12.26%		2.17%

We can find the two groups of the TOP5 products are completely different. Maybe new products have better sales performance. In this year, the TOP5 stores take 12.26% of total sales, in the last year, 2.17%. On the one hand, this indicates these products increase the whole sales, so they are successful. On the other hand, it shows the overall sales increase is not evenly distributed on the products, which is not ideal in the long-term.

I also tried to find out if there is a linear relation between the average price of a product and its sales amount or sales units. After getting rid of the outliers, I plotted these series.

Average Price(x) VS TY SALES(y)

Average Price(x) VS TY UNITS(y)

The results didn't show clear linear relation.

5. Stores' Overall Performance

I ranked these stores by three attributes. Here are the TOP 5 and BOTTOM 5 stores based on different attributes and years.

rank	Store No.	Store type	TY SALES
1	A018	FLAGSHIP	645003.90
2	A005	SPORT PERFORMANCE	161091.00
3	A009	FLAGSHIP	124891.87
4	A002	FLAGSHIP	121674.23
5	A065	FLAGSHIP	98741.23

rank	Store No.	Store type	LY SALES
1	A018	FLAGSHIP	453589.93
2	A005	SPORT PERFORMANCE	136899.91
3	A013	RUNNING	57725.61
4	A014	SPORT PERFORMANCE	57188.44
5	A039	JORDAN	51024.79

rank	Store No.	Store type	Grouth Rate
1	A015	KIDS	396.84%
2	A017	SPORT PERFORMANCE	340.18%
3	A016	SPORT PERFORMANCE	290.29%
4	A043	SPORT PERFORMANCE	159.24%
5	A009	FLAGSHIP	151.33%

The results are similar with weekly data, FLAGSHIP stores performed well, a KIDS store showed great growth.
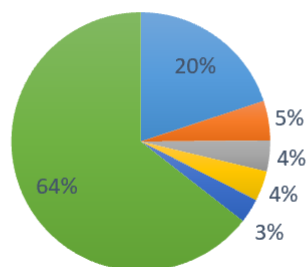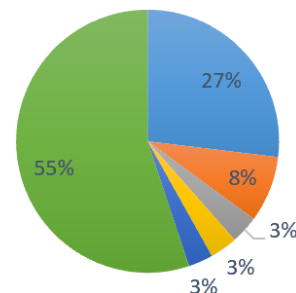
Similarly, the percentage of the TOP5 stores decreased, mostly for the TOP1 store.

This decline is good, indicating that Nike's dependence on top stores has decreased. This is conducive to reduce operational risk and long-term development.