

Sales Trends Analysis: A SQL-Powered Analysis

Introduction

In the world of data-driven decision-making, SQL (Structured Query Language) emerges as a key player. Leveraging SQL allows us to explore, analyze, and derive meaningful patterns from our sales data. In this analysis we dive deep into a comprehensive sales trends analysis of the United States Retail Services from 2010 to 2022 using the power of SQL.

Dataset Overview

Source of the data: <https://www.kaggle.com/datasets/mohammadkaiftahir/us-store-sales-dataset>

Before delving into the analysis, let's take a quick look at the dataset. Our sales data spans from January 2010 to December 2022 and includes information such as:

Month: month number of the sales

Year: year of the sales

Naics_code: North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments (<https://www.census.gov/naics/>)

Kind_of_business: specific type of the business

Industry: which industry the business belongs to

Sales: total sales recorded by the business

SQL Queries for Data Exploration

1. Which industry has the highest sales revenue for 2022

```
select
    industry,
    sum(sales) revenue
from
    retail_sales rs
where
    year = 2022
group by
    industry
```

```
order by
revenue desc;
```

Result:

ABC industry	123 revenue
Automotive	5,624,234
Food & Beverage	3,273,212
Restaurants & Bars	2,352,998
General Merchandise	1,896,031
Home Goods & Electronics	1,782,212
Miscellaneous	1,494,243
Home Goods & Building Supplies	1,011,613
Fuel & Gasoline	806,410
Fashion & Accessories	746,805
Health & Personal Care	728,466
Sports & Recreation	211,939
Office Supplies & Gifts	64,018

The automotive industry has the highest total sales revenue for the year 2022 with an impressive total sales revenue of 5.62 trillion dollars. On the other hand, the Office Supply and Gifts industry has the lowest revenue with 64 million dollars for the year of 2022.

2. Which kind of business within the Automotive industry had the highest sales revenue for 2022?

```
select
    kind_of_business,
    sum(sales) Revenue
from
    retail_sales rs
where
    year = 2022
    and industry like "Automotive%"
group by
    kind_of_business
order by
    Revenue desc;

select sum(sales) from retail_sales rs2 where industry like "Automotive%";
```

Result:

asc kind_of_business	127 Revenue
Motor vehicle and parts dealers	1,527,928
Automobile and other motor vehicle dealers	1,403,735
Automobile dealers	1,284,189
New car dealers	1,123,378
Used car dealers	160,811
Automotive parts, acc., and tire stores	124,193

3. What is the contribution percentage of each within the Automotive industry in 2022?

```
select
  kind_of_business,
  sum(sales) / (select sum(sales)
    from retail_sales rs2
    where industry like "Automotive%" and year = 2022) * 100 perc revenue
from
  retail_sales rs
where
  year = 2022
  and industry like "Automotive%"
group by
  kind_of_business
order by
  perc revenue desc;
```

Result:

asc kind_of_business	127 perc_revenue
Motor vehicle and parts dealers	27.1669
Automobile and other motor vehicle dealers	24.9587
Automobile dealers	22.8331
New car dealers	19.9739
Used car dealers	2.8593
Automotive parts, acc., and tire stores	2.2082

"The Motor Vehicle and parts dealers" make the largest contribution (27%) to high total sales in the automotive industry, closely followed by "Automobile and other motor vehicle dealers" which contribute (24%) of total sales in the same industry. In Contrast "Automotive Parts, acc, and tire stores" has the least impact in the total sales automotive industry revenue (2.2 %).

4. How has the sales revenue changed over time for the Motor vehicle and part dealers?

```
select year, sum(sales) yearly_revenue
from retail_sales rs
where kind_of_business = "Motor vehicle and parts dealers"
group by year
order by year desc;
```

Result:

123 year	123 yearly_revenue
2,022	1,527,928
2,021	1,480,124
2,020	1,208,304
2,019	1,237,744
2,018	1,204,941
2,017	1,185,696
2,016	1,151,720
2,015	1,103,521
2,014	1,026,740
2,013	962,057
2,012	886,494
2,011	812,938
2,010	742,913

The "Motor Vehicle and parts dealers" business has seen steady growth in total sales revenue over the past several years however a notable exception in 2020 where the total sales declined compared to the total sales of the previous year. So, in 2020 this business lost a bit of revenue, indicating a negative growth. We are going to further study the year 2020 to understand the effect of the covid-19 pandemic. So, we will look deeper into every kind of business to understand how the pandemic impacted their industry.

5. How much did "Motor Vehicle and parts dealers" experience a month-over-month growth rate in 2020?

```
select
    curr.month current_month,
    prev.month previous_month,
    (curr.sales - prev.sales)/prev.sales * 100
    MoM_growth_rate
from retail_sales curr
join retail_sales prev on curr.month = prev.month + 1
```

```

and curr.year = prev.year
and curr.kind_of_business =
prev.kind_of_business
where curr.year = 2020
and curr.kind_of_business = "Motor vehicle and parts
dealers";

```

Result:

123 current_month	123 previous_month	127 MoM_growth_rate
2	1	4.4935
month: int 3	2	-16.1071
4	3	-15.8888
5	4	54.217
6	5	6.2933
7	6	1.6195
8	7	-0.4481
9	8	-2.6036
10	9	1.4908
11	10	-10.0046
12	11	12.7119

we examined the Month over Month growth rate in 2020 for "Motor vehicle and parts dealers" industry and observed a rise in sales during February however sales declined in march and April before showing significant improvement in may leading to positive growth which persisted through July before declining in August, September and November. December marks a better month with a growth rate of 12. This indicates that 2020 was a volatile year for this business with fluctuations in sales throughout the year.

6. which businesses have the highest total sales for the "food and beverage" industry for each year?

```

with yearly_total_sales as (
  select year, kind_of_business, sum(sales) total_sales
  from retail_sales
  where industry = "Food & Beverage"
  group by year, kind_of_business
),
top_yearly_sales as (

```

```

select year, max(total_sales) max_sales
from yearly_total_sales
group by year
)
select cte1.year , cte1.kind_of_business, cte2.max_sales
from yearly_total_sales as cte1
join top_yearly_sales cte2 on cte1.year = cte2.year and
                           cte1.total_sales =
cte2.max_sales;

```

Result:

123 year	ABC kind_of_business	123 max_sales
2,022	Food and beverage stores	947,550
2,021	Food and beverage stores	880,260
2,020	Food and beverage stores	850,215
2,019	Food and beverage stores	775,014
2,018	Food and beverage stores	749,867
2,017	Food and beverage stores	728,843
2,016	Food and beverage stores	702,020
2,015	Food and beverage stores	687,375
2,014	Food and beverage stores	670,473
2,013	Food and beverage stores	641,515
2,012	Food and beverage stores	628,205
2,011	Food and beverage stores	609,137
2,010	Food and beverage stores	580,530

The 5 distinct business within the Food & Beverage industry are :

```

SELECT DISTINCT kind_of_business
FROM retail_sales rs
WHERE industry = 'Food & Beverage';

```

ABC kind_of_business
Food and beverage stores
Grocery stores
Supermarkets and other grocery (except convenience) stores
Beer, wine, and liquor stores
Warehouse clubs and superstores

Within the food and beverages industry there are 5 distinct business type "Food and beverage stores", "Grocery stores" "Supermarkets and other grocery (except convenience) stores", "Beer, wine, and liquor stores", "Warehouse clubs and superstores", from 2010 to 2022 "Food and beverage stores" consistently reported the highest total sales however it's unclear how many businesses exist within each business type and this can potentially explain the observed trend, despite this the "Food and beverage stores" remains the largest contributor to this industry overall sales. To make a more accurate comparison between business type we can calculate the maximum average sale instead of the maximum total sales, that way we can have a fair comparison of sales figures.

7. what is the revenue change in percentage for each industry from 2019 to 2020?

```
with rev_2020 as (  
  select industry, sum(sales) sales_2020  
  from retail_sales rs  
  where year = 2020  
  group by industry  
)  
rev_2019 as (  
  select industry, sum(sales) sales_2019  
  from retail_sales rs  
  where year = 2019  
  group by industry  
)  
select  
  rev_2020.industry,  
  sales_2019,  
  sales_2020,  
  (sales_2020 - sales_2019)/sales_2019 * 100 YoY_growth  
from  
  rev_2020  
join rev_2019 on  
  rev_2020.industry = rev_2019.industry  
order by  
  YoY_growth desc;
```

ABC industry	123 sales_2019	123 sales_2020	123 YoY_growth
Miscellaneous	899,266	1,121,336	24.6946
Home Goods & Building Supplies	742,580	839,850	13.0989
Home Goods & Electronics	1,322,438	1,456,612	10.146
Food & Beverage	2,689,614	2,932,231	9.0205
Sports & Recreation	150,321	160,453	6.7402
Health & Personal Care	628,667	650,043	3.4002
General Merchandise	1,648,068	1,664,615	1.004
Automotive	4,606,586	4,462,952	-3.118
Fuel & Gasoline	548,505	457,316	-16.625
Office Supplies & Gifts	57,748	47,718	-17.3686
Restaurants & Bars	2,121,944	1,590,299	-25.0546
Fashion & Accessories	712,940	523,161	-26.6192

what kind of business are included in "miscellaneous" industry?

```
select distinct kind_of_business , naics_code
from retail_sales rs
where industry = 'Miscellaneous';
```

ABC kind_of_business	ABC naics_code
Miscellaneous store retailers	453.0
Used merchandise stores	45330.0
Nonstore retailers	454.0

This result shows that miscellaneous store has seen a 24% increase in their revenue from 2019 to 2020. There are 3 different kinds of businesses in the "miscellaneous industry": "Miscellaneous store retailers", "Used merchandise stores", "Nonstore retailers" followed by "Home goods and building supplies" with 13%, the definition of this business is located on <https://www.census.gov/naics/> NAICS = North American industrial Classification System looking at the definition must to the business in this categories are business having sales made directly to home and this make sense because in 2020 people were at home due to covid-19 pandemic.

what is the contribution percentage of the miscellaneous businesses in 2020?

```
select
  kind_of_business,
  sum(sales)/(select
    sum(sales)
    from
      retail_sales rs
    where year = 2020 and
          industry = "Miscellaneous") * 100 perc
from
  retail_sales rs2
where year = 2020 and
      industry = "Miscellaneous"
group by
  kind_of_business
order by
  2 desc;
```

asc kind_of_business	123 perc
Nonstore retailers	87.2447
Miscellaneous store retailers	11.2962
Used merchandise stores	1.4592

87% of the sales in 2020 in "Miscellaneous" industry comes from the "Nonstore retailers", this could be attributed to the fact that people spent more time either due to remote work or to quarantine measures leading to an increase demand of door-to-door sales or home ordering like "AMAZON". "Sport and recreation" have 6% growth in revenue let's check the kind of businesses insight this industry.

```
select distinct kind_of_business
from retail_sales rs
where industry like "Sports%";
```

asc kind_of_business
Sporting goods, hobby, musical instrument, and book stores
Sporting goods stores
Hobby, toy, and game stores
Book stores

This makes sense because people have more time, so they find various hobbies to spend their time on.

8. What is the year-over-year growth rate for each industry per year?

```
with total_sales as (
  select year, industry, sum(sales) revenue
  from retail_sales rs
  group by year, industry
)
select curr.industry,
       prev.year,
       curr.year,
       (curr.revenue - prev.revenue)/prev.revenue * 100
  as YoY_growth
from total_sales curr
join total_sales prev on curr.year = prev.year + 1
                    and curr.industry = prev.industry
order by curr.industry, curr.year desc ;
```

industry	123 year	123 year	123 YoY_growth
Home Goods & Buildin	2,021	2,022	6.8436
Home Goods & Buildin	2,020	2,021	12.7364
Home Goods & Buildin	2,019	2,020	13.0989
Home Goods & Buildin	2,018	2,019	1.6393
Home Goods & Buildin	2,017	2,018	5.5384
Home Goods & Buildin	2,016	2,017	3.6182
Home Goods & Buildin	2,015	2,016	4.4573
Home Goods & Buildin	2,014	2,015	3.6751
Home Goods & Buildin	2,013	2,014	4.9252
Home Goods & Buildin	2,012	2,013	6.2071
Home Goods & Buildin	2,011	2,012	4.3342
Home Goods & Buildin	2,010	2,011	3.4383
Home Goods & Electro	2,021	2,022	5.4025
Home Goods & Electro	2,020	2,021	16.0819
Home Goods & Electro	2,019	2,020	10.146
Home Goods & Electro	2,018	2,019	5.5226
Home Goods & Electro	2,017	2,018	6.1438
Home Goods & Electro	2,016	2,017	3.8788
Home Goods & Electro	2,015	2,016	4.1542
Home Goods & Electro	2,014	2,015	5.7082
Home Goods & Electro	2,013	2,014	4.5645
Home Goods & Electro	2,012	2,013	3.3142
Home Goods & Electro	2,011	2,012	5.9162
Home Goods & Electro	2,010	2,011	5.4853
Miscellaneous	2,021	2,022	11.6659
Miscellaneous	2,020	2,021	19.3342
Miscellaneous	2,019	2,020	24.6946
Miscellaneous	2,018	2,019	9.4873
Miscellaneous	2,017	2,018	9.7883
Miscellaneous	2,016	2,017	9.8152
Miscellaneous	2,015	2,016	7.6173
Miscellaneous	2,014	2,015	6.3637
Miscellaneous	2,013	2,014	6.7997
Miscellaneous	2,012	2,013	4.5684
Miscellaneous	2,011	2,012	7.0129

Over all the YoY growth of various industries indicates that the pandemic negatively impacted the Automotive, Fashion & Accessories, Office Supplies & Gifts, Fuel & Gasoline, and the Restaurants & Bars industries in 2020. However these same industries experience significant growth in the subsequent year in 2021. The "Food & Beverage", "Miscellaneous", "Home Goods & Building Supplies" has seen a direct positive impact in 2020 and 2021, although the growth rate was heading back to the normal ranges in 2022.

9. What are the yearly total sales for women's clothing stores and men's clothing stores?

```
select
    year,
    sum(case when kind_of_business like "Women's clothing%"
then sales end) women_sales,
    sum(case when kind_of_business like "Men's clothing%"
then sales end) men_sales
from
    retail_sales rs
group by year;
```

123 year ▼	123 women_sales ▼	123 men_sales ▼
2,022	40,531	[NULL]
2,021	38,865	2,090
2,020	27,807	4,135
2,019	38,382	9,304
2,018	39,891	9,288
2,017	39,212	9,296
2,016	40,065	9,272
2,015	40,471	9,361
2,014	41,175	9,226
2,013	41,586	8,838
2,012	41,794	8,272
2,011	40,048	7,860
2,010	37,690	7,285

we can clearly see that women's clothing sales are much higher than men's clothing sales.

10. What is the yearly ratio of total sales for women's clothing stores to total sales for men's clothing stores?

```

with clothing_sales as (
  select
    year,
    sum(case when kind_of_business like "Women's clothing%"
then sales end) women_sales,
    sum(case when kind_of_business like "Men's clothing%"
then sales end) men_sales
  from
    retail_sales rs
  group by year
)
select
  year,
  women_sales / men_sales men_to_women_ratio
from
  clothing_sales;

```

123 year	123 men_to_women_ratio
2,022	[NULL]
2,021	18.5957
2,020	6.7248
2,019	4.1253
2,018	4.2949
2,017	4.2182
2,016	4.3211
2,015	4.3234
2,014	4.4629
2,013	4.7054
2,012	5.0525
2,011	5.0952
2,010	5.1736

The difference between women and men clothing sales increases Substantially in 2021 compare to previous years and in 2021 the women's total sales was 18% higher than men.

11. What is the year-to-date total sale for each month for 2019, 2020, 2021, 2022 for women's clothing stores?

```

select
  month,

```

```

    year,
    sales ,
    sum(sales) over(partition by year
order by
    month) ytd_sales
from
    retail_sales
where
    kind_of_business like "Women's clothing%"
    and year in (2022, 2021, 2020, 2019)
order by
    year desc,
    month;

```

123 month	123 year	123 sales	123 ytd_sales
1	2,022	2,422	2,422
2	2,022	2,729	5,151
3	2,022	3,658	8,809
4	2,022	3,628	12,437
5	2,022	3,704	16,141
6	2,022	3,213	19,354
7	2,022	3,177	22,531
8	2,022	3,266	25,797
9	2,022	3,197	28,994
10	2,022	3,260	32,254
11	2,022	3,807	36,061
12	2,022	4,470	40,531
1	2,021	2,140	2,140
2	2,021	2,149	4,289
3	2,021	3,255	7,544
4	2,021	3,267	10,811
5	2,021	3,502	14,313
6	2,021	3,368	17,681
7	2,021	3,437	21,118
8	2,021	3,202	24,320
9	2,021	3,113	27,433
10	2,021	3,269	30,702
11	2,021	3,823	34,525
12	2,021	4,340	38,865
1	2,020	2,477	2,477
2	2,020	2,745	5,222
3	2,020	1,568	6,790
4	2,020	535	7,325
5	2,020	1,175	8,500
6	2,020	2,187	10,687
7	2,020	2,567	13,254
8	2,020	2,590	15,844
9	2,020	2,665	18,509
10	2,020	2,823	21,332
11	2,020	2,920	24,252

In the first half of 2019 the women's clothing store revenue was 18 billion, and in the first half of 2020 it decreased to 10 billion dollars due to covid pandemic, the revenue bounce back in the first half of 2021 to 17 billion, and 19 billion in the first half of 2022.

12. What is the month-over-month growth rate of women's clothing business in 2022?

```
select *,
       (current_month_sales
prev_month_sales)/prev_month_sales*100 MoM_growth_rate
from (
      select month,
             sales current_month_sales,
             lag(sales, 1) over (order by month)
prev_month_sales
      from retail_sales rs
      where kind_of_business like "Women's clothing%"
            and year = 2022) temp;
```

123 month	123 current_month_sales	123 prev_month_sales	123 MoM_growth_rate
1	2,422	[NULL]	[NULL]
2	2,729	2,422	12.6755
3	3,658	2,729	34.0418
4	3,628	3,658	-0.8201
5	3,704	3,628	2.0948
6	3,213	3,704	-13.2559
7	3,177	3,213	-1.1204
8	3,266	3,177	2.8014
9	3,197	3,266	-2.1127
10	3,260	3,197	1.9706
11	3,807	3,260	16.7791
12	4,470	3,807	17.4153

This result shows that the women's clothing sales fluctuated a lot during 2022 where we can notice 4 months (April, June, July, September) with negative growth. Overall, the first month of the year and the last month of the year have performed the best for the women's clothing business.

Final Insights

Automotive:

The automotive industry had a YoY growth of 2.71% in 2022. However, the industry faced a significant decline in the YoY growth rate to -3% in 2020. When examining the data from 2010 to 2022, it becomes apparent that the auto industry's growth rate has been decreasing steadily until 2021, when it experienced an upturn following the pandemic-induced decline. In 2021, the industry had a tremendous growth rate of 22.69%. Overall, the automotive industry has shown a fluctuating trend in terms of YoY growth.

Fashion & Accessories:

The Fashion & Accessories industry had a YoY growth of 5.04% in 2022. The industry had a massive YoY growth rate of 35.90% in 2021, which was the highest YoY growth rate among all the industries and all years in the given table. However, the industry faced a significant decline in YoY growth rate of -26.62% in 2020. In 2011, the YoY growth rate was more than 6%, which was the highest among all the years in the given table, except the massive growth in 2021. Overall, the Fashion & Accessories industry has shown a fluctuating trend in terms of YoY growth.

Food & Beverage:

The YoY growth for the Food & Beverage industry was 7.09% in 2022, while its highest growth rate of 9% occurred during the pandemic year in 2020. The industry experienced a YoY growth rate of over 4% in 2011. In general, the Food & Beverage industry has shown more consistency and stability in its growth rate compared to other industries.

Fuel & Gasoline:

The Fuel & Gasoline industry had a YoY growth of 30.19% in 2022 and 35.4% in 2021. The industry faced a significant decline in YoY growth rate of -17.02% in 2015 and -16.62% in 2020. However, the industry had a significant increase in YoY growth rate of 35.44% in 2021, which is the highest in all years. In 2011, the YoY growth rate was more than 18%. Overall, the Fuel & Gasoline industry has shown a fluctuating trend in terms of YoY growth; in fact, it is the most fluctuating industry among all the industries given.

General Merchandise:

The General Merchandise industry had a YoY growth of 3.16% in 2022. In 2021, right after the pandemic year, the YoY growth rate was more than 10%, which was the highest among all the years in the given table. Overall, the General Merchandise industry has shown a steady growth rate over the years, except right after the Pandemic year. However, it looks like it is going back down to its steady growth rates.

Health & Personal Care:

The Health & Personal Care industry had a YoY growth of 3.26% in 2022. The industry had a YoY growth rate of 8.53% in 2021, which was the highest YoY growth rate among all the years in the given table. Overall, the health and personal care industry had steady growth, except right after the Pandemic year, when it saw more growth than ever.

Home Goods & Building Supplies:

The Home Goods & Building Supplies industry saw a YoY growth of 6.84% in 2022. The YoY growth rate for the home goods and building supplies industry saw a significant boost during the pandemic. In 2020, the industry had a growth rate of 13%, and 12% in 2021. The growth rate declined from 5.53% in 2018 to 1.63% in 2019. Overall, the home goods and building supplies had

a steady growth rate, except from 2018 to 2019, when the growth rate declined, and in 2020 and 2021, when the growth rate increased substantially.

Home Goods & Electronics:

The Home Goods & Electronics industry has shown a steady growth rate over the years. However, in 2022, the growth rate declined to 5.4025% from 16.0819% in the previous year. This decline could be due to various factors, including global shortages, which have led to a decrease in the production of electronic devices. In 2020 and 2021, the industry saw a significant increase in growth rate. Overall, the industry growth rate is steady, except during the pandemic. However, it went back down to its normal growth rate in 2022.

Miscellaneous:

The miscellaneous industry had a tremendous increase in the growth rate of 24.69% in 2020 and 19.33% in 2021. In 2022, although declined, it still secured its double-digit growth rate. The miscellaneous industry is another industry that has been positively impacted by the pandemic.

Office Supplies & Gifts:

The Office Supplies & Gifts industry has shown a mixed performance over the years, with some years indicating negative growth rates. In 2020, the office supplies and gifts industry saw a tremendous decline in growth rate, with -17.36%. The pandemic-induced remote working culture has impacted the demand for office supplies, although the following year, 2021, the industry saw huge growth. In 2022, the growth rate went down. However, it was still higher than prior to the pandemic year.

Restaurants & Bars:

The Restaurants & Bars industry has seen a fluctuating growth rate over the years, with the highest growth rate of 28.5073% in 2021. However, the pandemic affected the restaurants and bars industry unfavorably, with a growth rate of -25.0546% in 2020, indicating that the industry was severely impacted by the pandemic-induced restrictions. The positive growth rate in 2021 could be due to the easing of restrictions and the resumption of in-person dining. Although the 2022 growth rate of 15% is less than the previous year, the restaurants and bars industry's growth rate was still more than the normal rates over the years prior to the pandemic.

Sports & Recreation:

The industry was positively impacted by the pandemic, with a growth rate of 28.19% in 2021 and 6.74% in 2020, which is more than the previous year's growth rate. However, the industry's growth rate declined to 3% in 2022, indicating that the growth rate is going back to the normal range.

Overall,

The year-over-year growth rates of various industries indicate that the pandemic negatively impacted the auto, fashion, and accessories, office supplies and gifts, fuel and gasoline, and the restaurants and bars industries in 2020. However, these same industries experienced significant growth in the subsequent year. The food and beverage, miscellaneous, and home goods and building supplies industries had seen a direct positive impact in 2020 and 2021, although the growth rate was heading back to its normal ranges in 2022. Overall, the year 2021 proved favorable for numerous industries