Bike Store Data Analysis with SQL

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Project Objective

•**Analyze Overall Sales Performance:** Evaluate the store's sales metrics, such as monthly and yearly sales, to understand trends.

•**Assess Staff Contribution to Sales:** Examine individual and team staff performance to determine their direct impact on sales, including metrics like sales per employee and customer satisfaction ratings.

•**Identify Key Sales Drivers:** Pinpoint factors that significantly influence sales, such as popular product categories, customer demographics, or time of year, to better understand customer preferences.

•**Optimize Inventory Management:** Review inventory turnover and product stock levels to ensure adequate supply of high-demand products while minimizing excess inventory.

•**Benchmark Against Industry Standards:** Compare the bike store's sales and performance metrics with industry averages to evaluate competitive positioning.

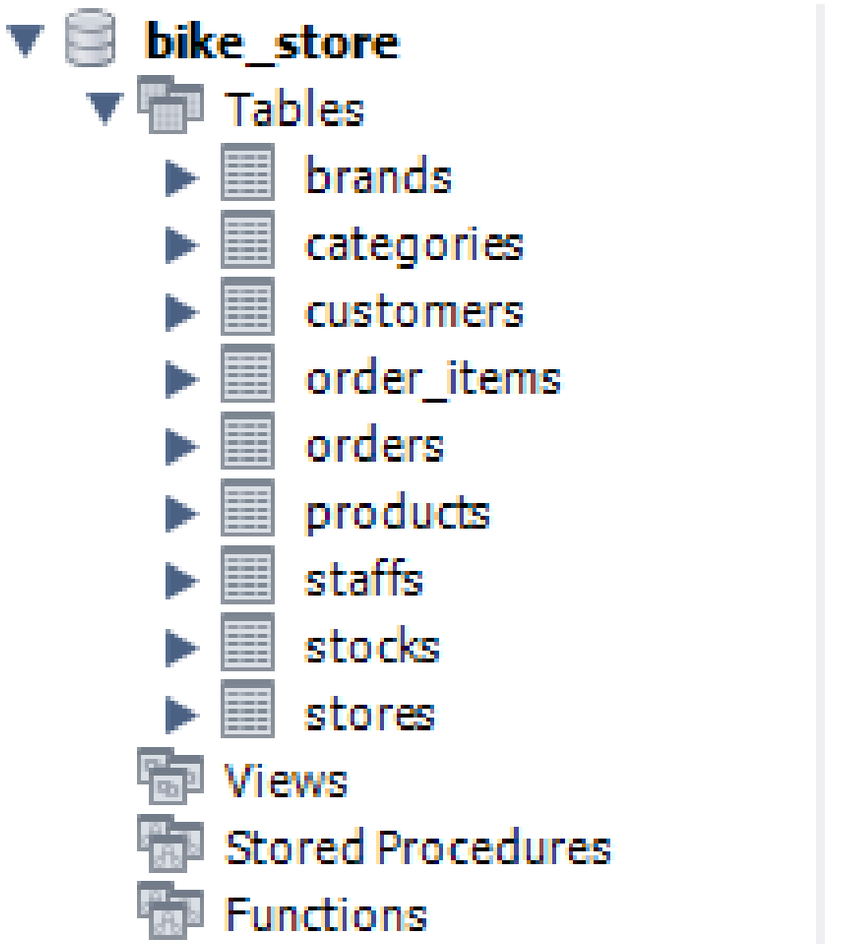
•**Address Real-World Business Challenges:** Apply analysis results to tackle real-world issues like inventory shortages, low-performing staff, or declining sales, and provide actionable insights.

•**Provide Actionable Recommendations:** Offer data-driven recommendations to improve sales strategies, optimize staff performance, and enhance customer satisfaction, supporting sustainable growth.

At first, created a database for “Bike Store” and imported all the tables to this schemas. Tables are brands, categories, customers, order_items, orders, products, staffs, stocks and stores.

```
Create database Bike_Store;
use bike_store;


select * from brands;
select * from categories;
select * from customers;
select * from order_items;
select * from orders;
select * from products;
select * from staffs;
select * from stocks;
select * from stores;
```



1. Brand Wise Bike Quantity Sold

```sql
-- Brand Wise Quantity Sold
with sales_report as (
select
    o. order_id,
    o. item_id,
    o. product_id,
    o. quantity,
    o. list_price,
    p. brand_id,
    p. category_id,
    c. category_name,
    b. brand_name
from
    order_items as o
inner join
    products as p
on
    o. product_id = p. product_id
inner join
    categories as c
on
    p.category_id = c.category_id
inner join
    brands as b
on
    b. brand_id = p. brand_id)
```

```sql
select
    brand_name,
    sum(quantity) as total_QTY_sold
from sales_report
group by brand_name
order by total_QTY_sold desc
;
```

	brand_name	total_QTY_sold
▶	Electra	2612
	Trek	1839
	Surly	908
	Sun Bicycles	731
	Pure Cycles	376
	Haro	331
	Heller	138
	Ritchey	118
	Strider	25

2. Category Wise Quantity Sold

```sql
-- Category Wise Quantity Sold
with sales_report as (
select
    o. order_id,
    o. item_id,
    o. product_id,
    o. quantity,
    o. list_price,
    p. brand_id,
    p. category_id,
    c. category_name,
    b. brand_name
from
    order_items as o
inner join
    products as p
on
    o. product_id = p. product_id
inner join
    categories as c
on
    p.category_id = c.category_id
inner join
    brands as b
on
    b. brand_id = p. brand_id)
```

```sql
select
    category_name,
    sum(quantity) as total_QTY_sold
    from sales_report
group by category_name
order by total_QTY_sold desc
;
```

category_name	total_QTY_sold
Cruisers Bicycles	2063
Mountain Bikes	1755
Children Bicycles	1179
Comfort Bicycles	813
Road Bikes	559
Cyclocross Bicycles	394
Electric Bikes	315

```sql
-- Year wise orders
select
    year(order_date) as order_year,
    count(order_id) as total_received_orders
from orders
group by order_year
order by order_year
;
```

3. Year Wise Orders

order_year	total_received_orders
2016	635
2017	688
2018	292

```sql
-- Month Wise Order for a Particular Year
select
    month (order_date) as order_month,
    count(order_id) as received_order
from orders
where order_date = 2016
group by order_month
order by order_month;
```

4. Month Wise Order for a Particular Year

order_month	received_order
1	50
2	49
3	55
4	43
5	51
6	45
7	50
8	63
9	67
10	64
11	43
12	55

```sql
-- Average delay between required date and shipping date
with cte as (
select
    order_id,
    order_date,
    required_date,
    shipped_date,
    datediff(required_date, shipped_date) as time_difference
from orders)
select
    avg(time_difference) as Days_Delay
    from cte
;

-- Top 10 Highest Purchasing Customers
with top_customers as (
select
     o. order_id,
     o. customer_id,
     c. first_name,
     c. last_name
from
     orders o
join
     customers c
on
     o. customer_id = c. customer_id)

select
     first_name,
     count(order_id) as totalOrders
from top_customers
group by first_name
order by totalOrders desc
limit 10
     ;
```

5. Avg. Delay Between Required & Shipping Date

	Days_Delay
▶	0.0152

6. Top 10 Purchasing Customers

	first_name	totalOrders
▶	Lorrie	5
	Latasha	5
	Aleta	5
	Jamaal	5
	Genoveva	5
	Carola	4
	Diana	4
	Garry	4
	Kasha	4
	Lolita	4

7. Support Staff Overall Performance Analysis

```sql
-- Stuff performance analysis based on orders handling, avg. delay, sales
with staff_performance as (
select
    o. order_id,
    o. customer_id,
    o. order_date,
    o. required_date,
    o. shipped_date,
    o. staff_id,
    s. first_name,
    s. last_name,
    i. product_id,
    i. quantity,
    i. list_price
from
    orders o
join
    staffs s
on
    o.staff_id = s.staff_id
join
    order_items i
on
     o.order_id = i.order_id )
 select
     staff_id,
     first_name,
     last_name,
     avg(datediff(order_date, shipped_date)) as Avg_Delay_OrderToShipment,
     avg(datediff(required_date, shipped_date)) as Avg_Delay_RequiredToShipment,
     count(order_id) as OrderHandling,
     round(sum(list_price),2) as TotalSales,
     round(round(sum(list_price),2)/ count(order_id),2) as SalesPerOrder
     from staff_performance
 group by staff_id, first_name, last_name
 order by orderHandling desc
     ;
```

staff_id	first_name	last_name	Avg_Delay_OrderToShipment	Avg_Delay_RequiredToShipment	OrderHandling	TotalSales	SalesPerOrder
6	Marcelene	Boyer	-1.9700	0.0087	1615	1955964.14	1211.12
7	Venita	Daniel	-1.9659	-0.0014	1580	1938990.58	1227.21
3	Genna	Serrano	-2.0186	0.0767	544	625915.93	1150.58
2	Mireya	Copeland	-2.0670	-0.1263	462	565457.74	1223.93
8	Kali	Vargas	-1.8858	0.1324	269	337904.51	1256.15
9	Layla	Terrell	-2.0047	0.0991	252	302173.67	1199.1

8. Inventory Stock Analysis Category Wise

```sql
-- Inventory stock analysis by category wise
with stocks_analysis as (
select
    s. store_id,
    s. product_id,
    s. quantity,
    t. store_name,
    p. product_name,
    p. category_id,
    c. category_name
from
    stocks s
join
    stores t
on
    s.store_id= t.store_id
join
    products p
on
    s.product_id= p.product_id
join
    categories c
on
    p. category_id= c.category_id)
select
category_name,
count(category_name) as inTotal
from stocks_analysis
group by category_name
order by inTotal desc
    ;
```

	category_name	inTotal
▶	Cruisers Bicycles	234
	Mountain Bikes	180
	Children Bicycles	177
	Road Bikes	162
	Comfort Bicycles	84
	Electric Bikes	72
	Cyclocross Bicycles	30

9. Inventory Stock Analysis Product Wise

```sql
-- Inventory stock analysis product wise
with stocks_analysis as (
select
    s. store_id,
    s. product_id,
    s. quantity,
    t. store_name,
    p. product_name,
    p. category_id,
    c. category_name
from
    stocks s
join
    stores t
on
    s.store_id= t.store_id
join
    products p
on
    s.product_id= p.product_id
join
    categories c
on
    p. category_id= c.category_id)
select
    product_name,
    count(product_name) as InStock
        from stocks_analysis
group by product_name
order by InStock desc
;
```

	product_name	InStock
▶	Electra Townie Go! 8i - 2017/2018	9
	Electra Townie Original 21D - 2016	6
	Electra Cruiser 1 (24-Inch) - 2016	6
	Electra Girl's Hawaii 1 (16-inch) - 2015/2016	6
	Electra Townie Original 7D EQ - 2016	6
	Electra Townie Original 7D - 2017	6
	Sun Bicycles Cruz 3 - 2017	6
	Sun Bicycles Cruz 7 - 2017	6
	Electra Girl's Hawaii 1 16" - 2017"	6
	Surly Straggler 650b - 2018	6
	Surly Straggler - 2018	6
	Electra Townie Go! 8i Ladies' - 2018	6
	Electra Townie Commute Go! - 2018	6
	Electra Townie Commute Go! Ladies' - 2018	6
	Electra Townie Original 21D - 2018	6
	Electra Townie Original 21D EQ - 2017/2018	6
	Electra Cruiser 7D (24-Inch) Ladies' - 2016/2018	6
	Electra Townie Balloon 8D EQ - 2016/2017/2018	6

10. Inventory Stock Analysis for “Baldwin Bikes ” Store

```sql
-- Inventory stock analysis by Outlet Wise
with stocks_analysis as (
select
    s. store_id,
    s. product_id,
    s. quantity,
    t. store_name,
    p. product_name,
    p. category_id,
    c. category_name
from
    stocks s
join
    stores t
on
    s.store_id= t.store_id
join
    products p
on
    s.product_id= p.product_id
join
    categories c
on
    p. category_id= c.category_id)

select
    Category_Name,
    count(category_name) as No_of_QTY
    from stocks_analysis
WHERE
        store_name = "Baldwin Bikes"
group by
    category_name
order by
    No_of_QTY desc
    ;
```

	category_name	No_of_QTY
▶	Cruisers Bicycles	78
	Mountain Bikes	60
	Children Bicycles	59
	Road Bikes	54
	Comfort Bicycles	28
	Electric Bikes	24
	Cyclocross Bicycles	10

```sql
-- Volume of Customers by City Wise
select
    city,
    count(city) No_of_Customers
 from customers
 group by city
 order by No_of_Customers desc
 ;
-- Bike model wise product sales
with Bike_ModelSales as (
select
   o. order_id,
   o. item_id,
   o. product_id,
   o. quantity,
   o. list_price,
   p. model_year
from
   order_items o
join
   products p
on
   o.product_id= p.product_id)
select
   model_year,
   round(sum(list_price),0) as Sales
   from bike_ModelSales
group by model_year
order by Sales desc
   ;
```

11. City/ State Wise Customer Density

city	No_of_Customers
Mount Vernon	20
Scarsdale	17
Ballston Spa	17
Canandaigua	14
Longview	13
Ossining	13
Floral Park	13
Sunnyside	12
Astoria	12
Richmond Hill	12
Merrick	12
San Angelo	12
Howard Beach	12
Smithtown	12
Webster	12

12. Bike Model Wise Sales

model_year	Sales
2016	2379763
2017	2367742
2018	978901

13. Discount Analysis by Product Wise

```sql
-- Total discount by product wise
with discount_analysis as (
select
    o. product_id,
    o. quantity,
    o. list_price,
    o. discount,
    p. product_name
from
    order_items o
join
    products p
on
    o.product_id=p.product_id)
select
    product_name,
    round(sum(discount),2)   as Total_Discount_Percentage
        from discount_analysis
group by product_name
order by Total_Discount_Percentage desc
    ;
```

product_name	Total_Discount_Percentage
Electra Girl's Hawaii 1 (16-inch) - 2015/2016	19.89
Electra Townie Original 7D EQ - 2016	19.41
Electra Cruiser 1 (24-Inch) - 2016	19.08
Electra Townie Original 21D - 2016	19.07
Surly Ice Cream Truck Frameset - 2016	11.33
Electra Girl's Hawaii 1 (20-inch) - 2015/2016	11.05
Trek Fuel EX 8 29 - 2016	10.92
Surly Straggler 650b - 2016	10.77
Trek Conduit+ - 2016	10.52
Surly Straggler - 2016	10.43
Heller Shagamaw Frame - 2016	10.22
Trek Slash 8 27.5 - 2016	10.02
Electra Townie Original 7D - 2015/2016	9.94
Electra Townie Original 7D EQ - Women's - 2016	9.54
Electra Moto 1 - 2016	9.24
Surly Wednesday Frameset - 2016	9.08
Pure Cycles Western 3-Speed - Women's - 201...	9
Pure Cycles Vine 8-Speed - 2016	8.74

Actionable Recommendations

•**Boost Low-Selling Brands**: Brands with the lowest sales volume, such as Heller, Ritchey, and Strider, need focused marketing and advertising efforts to improve sales.

•**Promote All Categories**: While “Cruisers Bicycles” is the most popular category, we should also promote other bicycle categories to increase diversity in customer purchases.

•**Focus on Popular Models**: The 2016 model is the most preferred by customers, followed by 2017 and 2018 models. Ensuring availability of these models may continue to drive sales.

•**Investigate May 2018 Sales Drop**: Although business was strong in 2016 and 2017, a sudden drop in sales occurred in May 2018. Investigating the root cause could reveal opportunities to prevent future declines.

•**Timely Shipping**: The average delay between required date and shipping date is currently acceptable. We should maintain this performance to meet customer expectations.

•**Retain Top Customers**: We’ve identified our top 10 highest-purchasing customers. Offering them loyalty programs or exclusive deals could help in retaining them as loyal customers.

•**Staff Performance Insights**: Mr. Marcelene and Ms. Vinita are top-performing staff members, excelling in order handling, total sales, and other metrics. Conversely, four staff members (ID: 1, 4, 5, and 10) have not handled any orders within the given period, suggesting a need for role assessment or realignment.

•**Inventory Needs**: The inventory of “Cyclocross Bicycles” is low, with only 30 units in stock. To avoid stockouts, additional orders should be placed to ensure a sufficient quantity is available.

•**Restocking Baldwin Bikes**: At the “Baldwin Bikes” store, only 10 units of “Cyclocross Bicycles” remain. Immediate restocking is recommended to avoid disruptions in sales.

•**Expand Customer Reach**: Most of our customers are located in Mount Vernon, Scarsdale, and Ballston Spa. We should consider targeted campaigns to attract customers from other regions across the USA to expand our market.

•**Optimize Discounts**: Products like Electra Girls Hawai, Electra Townie, and Electra Cruisers are discounted at over 19%, while Electra Superbolt, Trek Domane, and Trek Superfly have minimal discounts (below 0.06%). Adjusting these discounts could improve their appeal and boost sales.

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