RETAIL SALES ANALYSIS

By SQL and Power BI

Description:

This retail sales analysis is focused on deriving insights from transactional data using **SQL** and **Power BI**. The queries cover a wide range of business analysis, including sales performance, customer demographics, and operational metrics.

Objective:

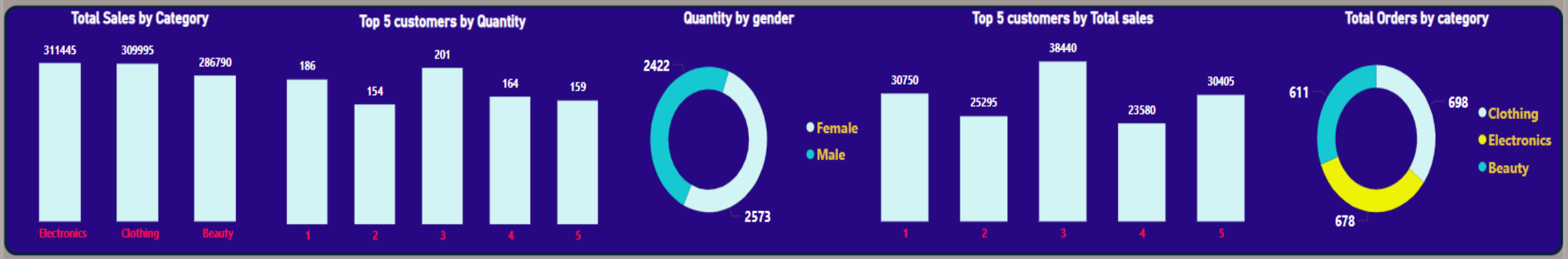
The goal of the retail sales analysis is to derive meaningful insights from a retail database. This includes querying specific sales data, identifying high-value customers, analyzing product categories, customer demographics, and understanding the distribution of sales over time.

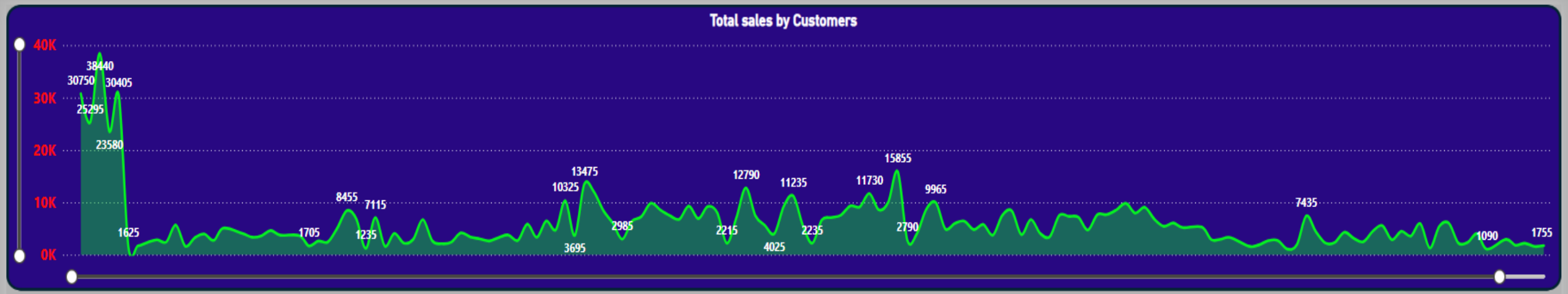
Overall Insights:

The analysis helps uncover trends related to product performance, customer demographics, sales seasonality, and high-value customers.
These insights are valuable for marketing, operational efficiency, product inventory management, and customer relationship management in retail operations.

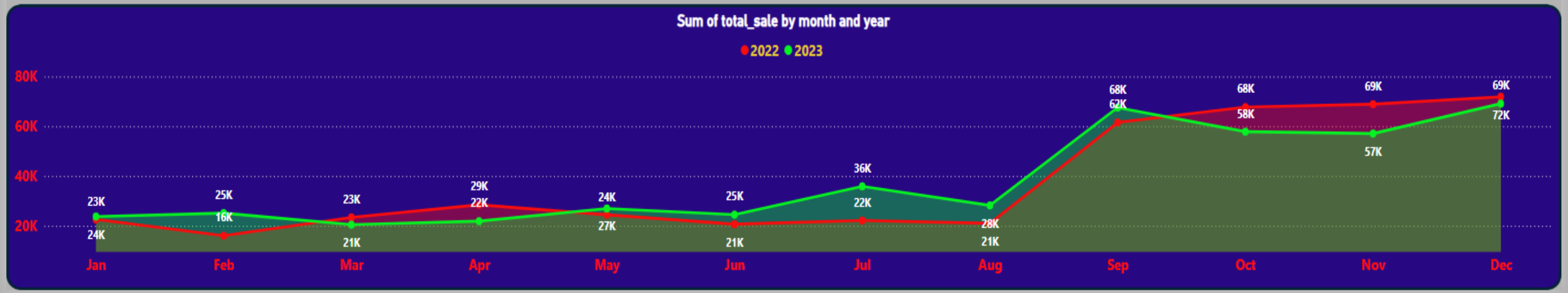
Retail Sales Analysis

Total Orders	Total Customers	Avg Price per Unit	Total Sales	Total Units Sold
1987	155	₹ 179.92	908.23K	4995




Total sales by Customers
40K
30K
20K
10K
0K
38440
30750
30405
25295
23580
1625
1705
8455
7115
1235
13475
10325
3695
2985
12790
2215
11235
4025
2235
11730
15855
9965
2790
7435
1090
1755

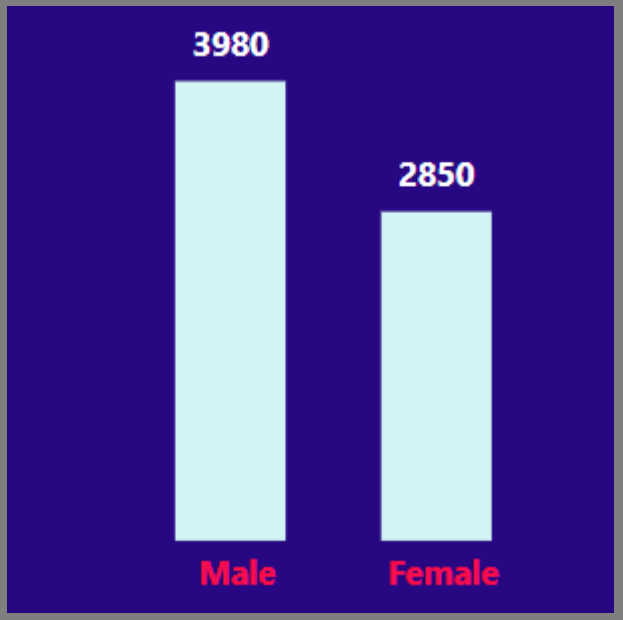

Quantity sold >= 4 on Nov,2022 in Clothing
12
10
8
6
4
12
7
4
5
4
4
7
4
7
8
5
6
4
4
4
4
7
4
8
6
7
4
4


Sum of total_sale by month and year
2022
2023
80K
60K
40K
20K
23K
24K
25K
16K
23K
21K
29K
22K
24K
27K
25K
21K
36K
22K
28K
21K
68K
62K
68K
58K
69K
57K
69K
72K
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

➔Retrieve all sales transactions recorded on November 5th, 2022 ?

```
select * from [Retail Sales Analysis]
where sale_date > '2022-11-04' and
sale_date < '2022-11-06'
```

	transactions_id	sale_date	sale_time	customer_id	gender	age	category	quantiy	price_per_unit	cogs	total_sale
1	180	2022-11-05	10:47:00.0000000	117	Male	41	Clothing	3	300	129	900
2	214	2022-11-05	16:31:00.0000000	53	Male	20	Beauty	2	30	8.10000038146973	60
3	240	2022-11-05	11:49:00.0000000	95	Female	23	Beauty	1	300	123	300
4	856	2022-11-05	17:43:00.0000000	102	Male	54	Electronics	4	30	9.30000019073486	120
5	943	2022-11-05	19:29:00.0000000	90	Female	57	Clothing	4	300	318	1200
6	1137	2022-11-05	22:34:00.0000000	104	Male	46	Beauty	2	500	145	1000
7	1256	2022-11-05	09:58:00.0000000	29	Male	23	Clothing	2	500	190	1000
8	1265	2022-11-05	14:35:00.0000000	86	Male	55	Clothing	3	300	111	900
9	1587	2022-11-05	20:06:00.0000000	140	Female	40	Beauty	4	300	105	1200
10	1819	2022-11-05	20:44:00.0000000	83	Female	35	Beauty	2	50	13.5	100
11	1896	2022-11-05	20:19:00.0000000	87	Female	30	Electronics	2	25	30.75	50



i.e. 3980 + 2850 = 6830

The Total sales done in that particular day is .....

```
select sum(total_sale) as [Total sales 2022-11-05]
from [Retail Sales Analysis]
where sale_date > '2022-11-04' and
sale_date < '2022-11-06'
```

Total sales 2022-11-05
6830

➔ Calculate the total sales for each category ?

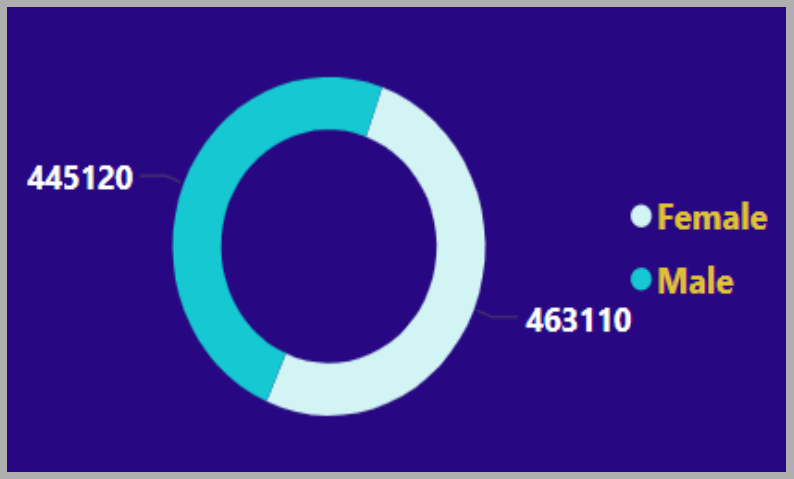
```
select category,
sum(total_sale) as [Total Sales]
from [Retail Sales Analysis]
group by category
```

category	Total Sales
Beauty	286790
Electronics	311445
Clothing	309995

Similarly Total Sales by Gender .....

```
select gender,
sum(total_sale) as [Total Sales] from [Retail Sales Analysis]
group by gender
```

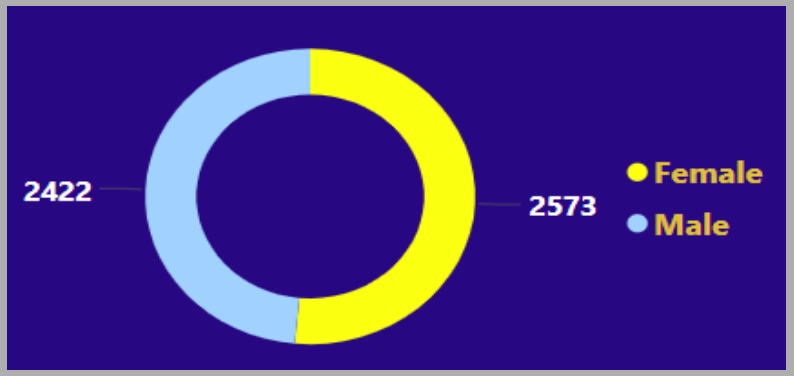
gender	Total Sales
Male	445120
Female	463110



Similarly Total Quantity by Gender .....

```
select gender,
sum(quantiy) as [Total quantiy]
from [Retail Sales Analysis]
group by gender
```

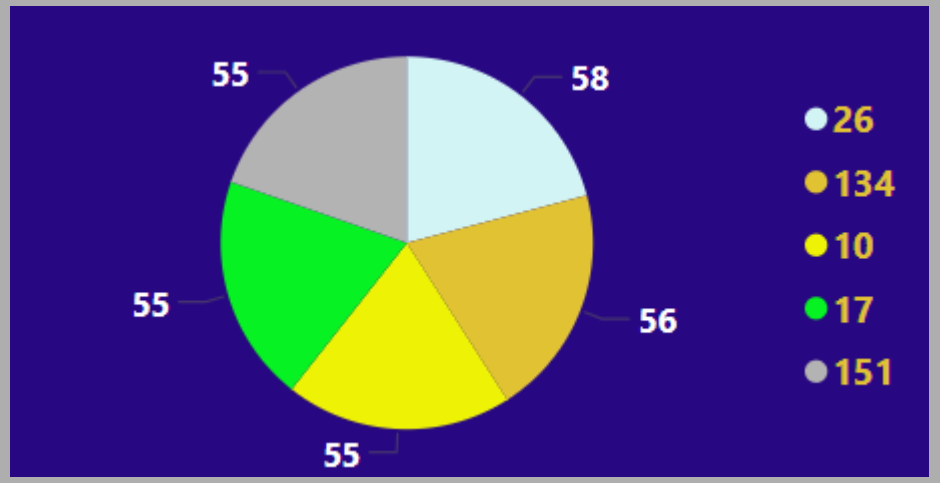
gender	Total quantiy
Male	2422
Female	2573



➔Find the average age of Top 5 customers who purchased items from the 'Beauty' category?

```
select
      avg(age) as [Average age of top 5 customers at "Beauty"]
          from
          [Retail Sales Analysis]
              where
            category = 'Beauty'
```

Average age of top 5 customers at "Beauty"
40

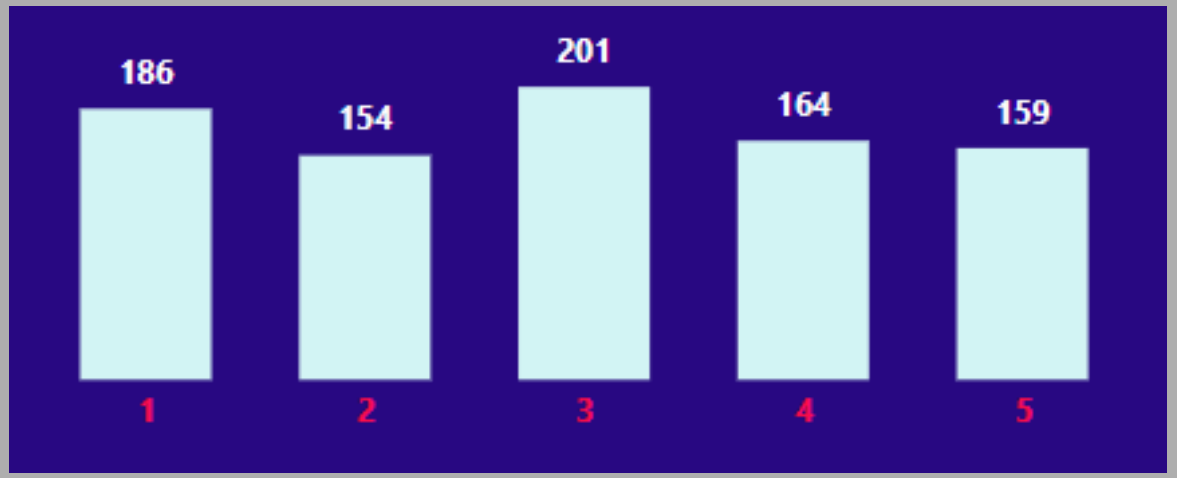


Note: The average age of Top 5 customers who purchased items from the 'Beauty' category is 40

➔Identify the top 5 customers based on the highest quantity sold?

```
select top 5 customer_id as [Customer ID],
sum(quantiy) as [Total quantity] from [Retail Sales Analysis]
group by customer_id order by [Total quantity] desc
```

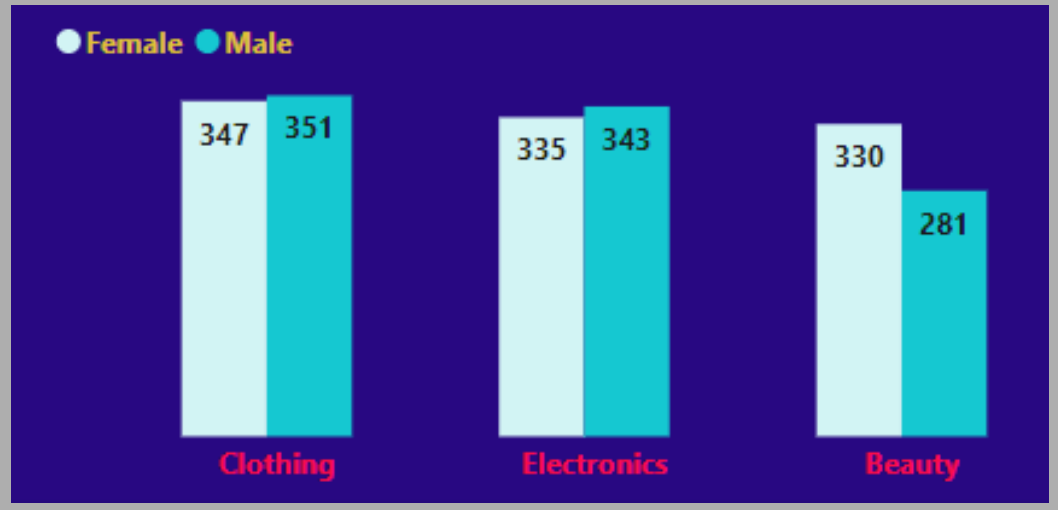
Customer ID	Total quantity
3	201
1	186
4	164
5	159
2	154



➔**Find the total No. of transactions made by each gender in each category ?**

```
select category as [Category], gender as [Gender],
count (*) as [Total no of transactions] from [Retail Sales Analysis]
group by
category, gender
order by category
```

Category	Gender	Total no of transactions
Beauty	Female	330
Beauty	Male	281
Clothing	Female	347
Clothing	Male	351
Electronics	Female	335
Electronics	Male	343

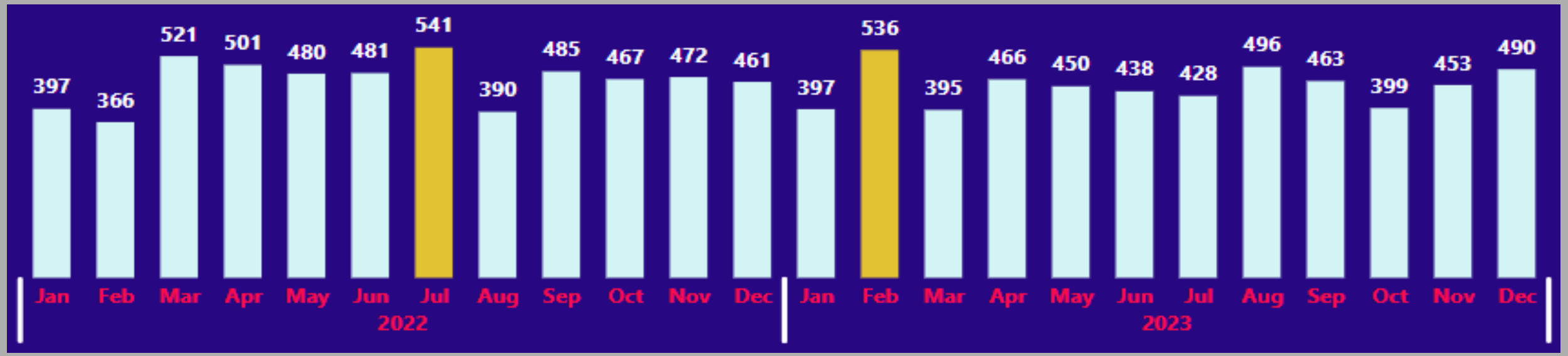


➔Find the average sale for each month. Find out best selling month in each year ?

```sql
    WITH MonthlySales AS (
    SELECT
        YEAR(sale_date) AS SaleYear, MONTH(sale_date) AS SaleMonth,  avg(total_sale) AS avgMonthlySale
    FROM [Retail Sales Analysis]
    GROUP BY YEAR(sale_date), MONTH(sale_date)
)
SELECT
    SaleYear, SaleMonth, avgMonthlySale
FROM (
    SELECT
        SaleYear, SaleMonth, avgMonthlySale,
        RANK() OVER (PARTITION BY SaleYear ORDER BY avgMonthlySale DESC) AS RankInYear
    FROM
        MonthlySales
) AS RankedSales
WHERE
    RankInYear = 1
ORDER BY SaleYear;
```

SaleYear	SaleMonth	avgMonthlySale
2022	7	541
2023	2	535

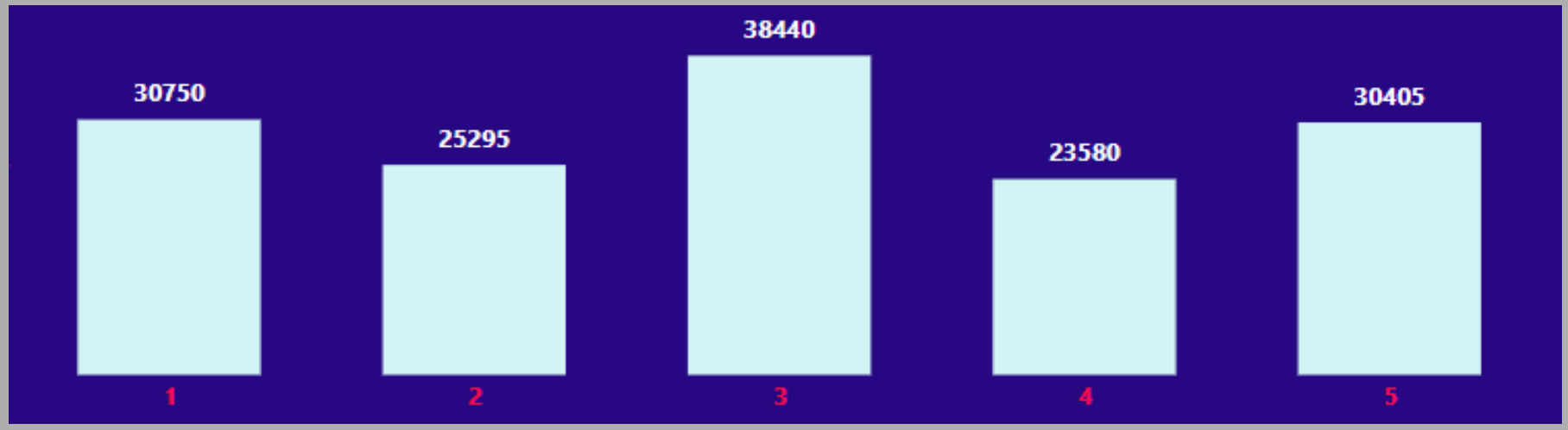
Note: Upon analysis, we observe that **June** recorded the highest sales in 2022, while **February** achieved the peak sales performance in 2023



➔Identify the top 5 customers based on the highest total sales ?

```
select top 5 customer_id as [Customer ID],
sum(total_sale) as [Total sales] from [Retail Sales Analysis]
group by customer_id order by [Total sales] desc
```

Customer ID	Total sales
3	38440
1	30750
5	30405
2	25295
4	23580



➔ Find the number of unique customers who purchased items from each category?

```
select category,
count(distinct customer_id) as [No of unique Customers]
from [Retail Sales Analysis]
group by category;
```

category	No of unique Customers
Beauty	141
Clothing	149
Electronics	144

➔ Find the number of orders who purchased items from each category?

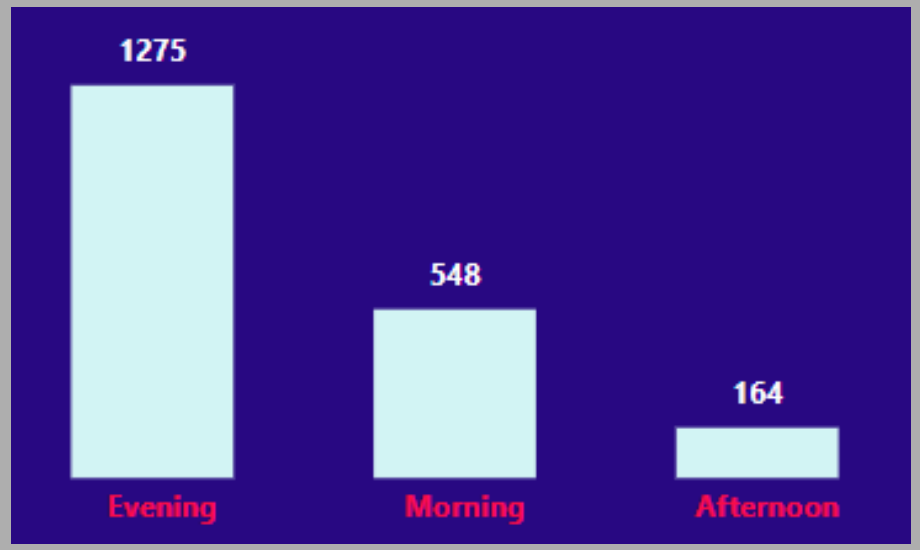
```
select category,
count(transactions_id) as [No of Orders]
from [Retail Sales Analysis]
group by category;
```

category	No of Orders
Beauty	611
Electronics	678
Clothing	698

➔ Calculate each shift (Morning <=12, Afternoon Between 12 & 17, Evening >17) and determine the number of orders for each shift ?

```
with hourly_sale
as
(
select *,
case
 WHEN DATEPART(HOUR, sale_time) < 12 THEN 'Morning'
        WHEN DATEPART(HOUR, sale_time) >= 17 THEN 'Evening'
else 'Afternoon'
end as Shift from [Retail Sales Analysis]
)
select
Shift,
count (*) as Total_orders
from hourly_sale
group by Shift
```

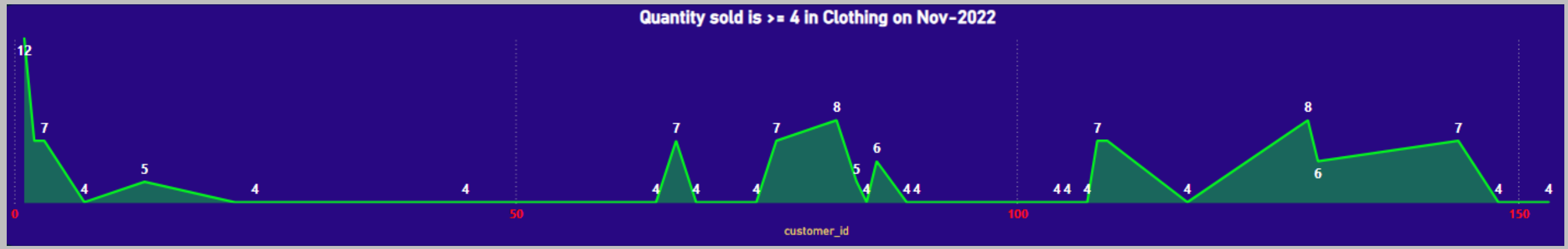
Shift	Total_orders
Evening	1275
Morning	548
Afternoon	164



➔ Retrieves all transactions where the category is 'Clothing' and the quantity sold is greater than or equal to 4 for the month of November 2022 ?

```
SELECT * FROM [Retail Sales Analysis]
WHERE category = 'Clothing'
AND quantiy >= 4 AND sale_date >= '2022-11-01' AND sale_date < '2022-12-01'
order by  sale_date
```

transactions_id	sale_date	sale_time	customer_id	gender	age	category	quantiy	price_per_unit	cogs	total_sale
1259	2022-11-03	17:31:00.0000000	105	Female	45	Clothing	4	50	21	200
943	2022-11-05	19:29:00.0000000	90	Female	57	Clothing	4	300	318	1200
1885	2022-11-09	07:32:00.0000000	148	Female	52	Clothing	4	30	10.8000001907349	120
146	2022-11-10	22:01:00.0000000	74	Male	38	Clothing	4	50	49	200
159	2022-11-10	21:30:00.0000000	42	Male	26	Clothing	4	50	23.5	200
1476	2022-11-11	22:27:00.0000000	130	Female	27	Clothing	4	500	555	2000
284	2022-11-12	09:17:00.0000000	129	Male	43	Clothing	4	50	20.5	200
547	2022-11-14	07:36:00.0000000	3	Male	63	Clothing	4	500	250	2000
64	2022-11-15	06:34:00.0000000	7	Male	49	Clothing	4	25	8.5	100
1615	2022-11-17	13:43:00.0000000	82	Female	61	Clothing	4	25	13.5	100
1497	2022-11-19	21:44:00.0000000	109	Male	41	Clothing	4	30	32.4000015258789	120
1696	2022-11-21	17:59:00.0000000	24	Female	50	Clothing	4	50	55	200
699	2022-11-21	22:21:00.0000000	129	Female	37	Clothing	4	30	16.2000007629395	120
1484	2022-11-23	09:29:00.0000000	22	Female	19	Clothing	4	300	147	1200
735	2022-11-26	21:38:00.0000000	153	Female	64	Clothing	4	500	515	2000
1296	2022-11-26	20:42:00.0000000	45	Female	22	Clothing	4	300	342	1200
965	2022-11-27	21:45:00.0000000	84	Male	22	Clothing	4	50	13	200



Thank You