

# Detailed Analysis of product and its Sales

Software Used - SQL

```
SELECT * FROM cm_orders
```

	invoice_id bigint	Branch text	City text	category text	unit_price double precision	quantity double prec
1	1	WALM003	San Antonio	Health and beauty	74.69	
2	2	WALM048	Harlingen	Electronic accessories	15.28	
3	3	WALM067	Haltom City	Home and lifestyle	46.33	
4	4	WALM064	Bedford	Health and beauty	58.22	
5	5	WALM013	Irving	Sports and travel	86.31	
6	6	WALM026	Denton	Electronic accessories	85.39	
7	7	WALM088	Cleburne	Electronic accessories	68.84	
8	8	WALM100	Canyon	Home and lifestyle	73.56	
9	9	WALM066	Grapevine	Health and beauty	36.26	
10	10	WALM065	Texas City	Food and beverages	54.84	
11	11	WALM013	Irving	Fashion accessories	14.48	
12	12	WALM035	San Angelo	Electronic accessories	25.51	

--Which city has the highest total sales?

```
SELECT cm_orders."City", ROUND(SUM(cm_orders.total)::"numeric") as total_sales  
from cm_orders  
GROUP by cm_orders."City"  
ORDER by total_sales desc  
LIMIT 5;
```

	City text	total_sales numeric
1	Weslaco	46352
2	Waxahac...	40703
3	Plano	25688
4	San Anto...	24951
5	Port Arthur	24524

--What is the average profit margin per category?

```

SELECT cm_orders.category,
round(avg(cm_orders.profit_margin)::numeric,2) as avg_profit_margin
FROM cm_orders
group by cm_orders.category
ORDER by avg_profit_margin DESC

```

	category text	avg_profit_margin numeric
1	Health and beauty	0.40
2	Food and beverages	0.40
3	Fashion accessories	0.39
4	Electronic accessories	0.39
5	Home and lifestyle	0.39
6	Sports and travel	0.38

--Which payment method is most used in each branch?

```

WITH cte AS (
  SELECT
    "Branch",
    payment_method,
    COUNT(invoice_id) AS txn_count,
    ROW_NUMBER() OVER (PARTITION BY "Branch" ORDER BY COUNT(invoice_id) DESC) AS rn
  FROM cm_orders
  GROUP BY "Branch", payment_method
)
SELECT "Branch",payment_method,txn_count
FROM cte
WHERE rn=1
Order by txn_count desc;

```

	Branch text	payment_method text	txn_count bigint
1	WALM058	Credit card	145
2	WALM009	Credit card	139
3	WALM084	Credit card	125
4	WALM055	Credit card	122
5	WALM074	Cash	121
6	WALM030	Credit card	120
7	WALM069	Credit card	118
8	WALM087	Credit card	117
9	WALM046	Credit card	117
10	WALM075	Credit card	115
11	WALM003	Credit card	115
12	WALM029	Credit card	113
13	WALM086	Credit card	112

--What are the top 5 categories by total quantity sold?

```
select category, count(invoice_id)
from cm_orders
group by
category
```

	category text	total_quantity_sold double precision
1	Fashion accessories	9653
2	Home and lifestyle	9610
3	Electronic accessories	1494
4	Food and beverages	952
5	Sports and travel	920
6	Health and beauty	854

--What is the hourly sales trend across all stores?

```
SELECT
  EXTRACT(HOUR FROM cm_orders.time:: time) AS hour_of_day,
  ROUND(SUM(total)::numeric, 2) AS total_sales
FROM cm_orders
GROUP BY hour_of_day
ORDER BY total_sales
LIMIT 5;
```

	hour_of_day numeric	total_sales numeric
1	15	142016.77
2	16	134918.07
3	19	128581.06
4	17	116301.16
5	18	113072.80



--Sales & Revenue Analysis

--What is the total sales across all branches?

```
SELECT "Branch", ROUND(SUM(total)::Numeric,2) AS sales
FROM cm_orders
GROUP BY "Branch"
ORDER BY sales desc
LIMIT 5;
```

	Branch text	sales numeric
1	WALM009	25688.34
2	WALM074	25555.42
3	WALM003	24950.56
4	WALM058	24524.37
5	WALM030	24460.60

--Which category has generated the highest revenue?

```
SELECT DISTINCT "category", ROUND(SUM(total)::numeric) AS revenue
FROM cm_orders
GROUP BY "category"
ORDER BY revenue DESC;
```

	category text	revenue numeric
1	Fashion accessories	489481
2	Home and lifestyle	489250
3	Electronic accessories	78175
4	Food and beverages	53471
5	Sports and travel	52498
6	Health and beauty	46851

--What is the average order value?

```
SELECT ROUND(SUM(total)::numeric
/count(distinct invoice_id),2) as avg_order_value
FROM cm_orders
```

	avg_order_value numeric
1	121.35

--How much profit is made per category?

```
SELECT "category", ROUND(SUM(profit_margin)::Numeric, 2) AS total_profit
FROM cm_orders
GROUP BY "category"
ORDER BY total_profit DESC;
```

	category text	total_profit numeric
1	Home and lifestyle	1783.50
2	Fashion accessories	1783.05
3	Electronic accessories	164.73
4	Food and beverages	69.66
5	Sports and travel	63.45
6	Health and beauty	60.84

--Which branch has the highest number of transactions?

```
SELECT "Branch", count(invoice_id) AS no_of_transactions
FROM cm_orders
GROUP BY "Branch"
ORDER BY no_of_transactions desc
LIMIT 5;
```

	Branch text	no_of_transactions bigint
1	WALM058	239
2	WALM009	235
3	WALM030	229
4	WALM069	222
5	WALM074	210

--What is the monthly trend of total sales?

```
SELECT TO_CHAR(TO_DATE(cm_orders.date,'DD-MM-YY'),'MONTH') as
month,ROUND(SUM(total)::Numeric,2) AS sales
FROM cm_orders
group by month
order by sales desc
```

	month text	sales numeric
1	DECEMBER	252617.00
2	NOVEMBER	244885.00
3	JANUARY	137481.16
4	MARCH	131692.34
5	FEBRUARY	122667.88
6	OCTOBER	74612.00
7	AUGUST	68894.00
8	SEPTEMBER	65543.00
9	MAY	31341.00
10	JULY	29080.00
11	JUNE	25645.00
12	APRIL	25268.00

-- What is the daily average revenue?

```
SELECT TO_CHAR(TO_DATE(cm_orders.date,'DD-MM-YY'),'DAY') as Day,  
ROUND(SUM(total)::numeric / COUNT(DISTINCT invoice_id), 2) AS avg_daily_revenue  
FROM cm_orders  
GROUP BY TO_CHAR(TO_DATE(cm_orders.date,'DD-MM-YY'),'DAY')
```

	day text	avg_daily_revenue numeric
1	FRIDAY	119.65
2	MONDAY	117.32
3	SATURDAY	128.82
4	SUNDAY	121.24
5	THURSDAY	119.00
6	TUESDAY	123.45
7	WEDNESDAY	119.61

--Which products (unit\_price range) contribute the most to sales?

```
SELECT  
CASE  
  WHEN unitprice <= 10 THEN '0-10'  
  WHEN unitprice <= 20 THEN '10-20'  
  WHEN unitprice <= 30 THEN '20-30'  
  WHEN unitprice <= 40 THEN '30-40'  
  WHEN unitprice <= 50 THEN '40-50'  
  WHEN unitprice <= 60 THEN '50-60'  
  WHEN unitprice <= 70 THEN '60-70'  
  WHEN unitprice <= 80 THEN '70-80'  
  WHEN unitprice <= 90 THEN '80-90'  
  ELSE '90-100'  
END AS unit_price_range,  
ROUND(SUM(total)::numeric, 2) AS total_sales  
FROM cm_orders  
GROUP BY unit_price_range  
ORDER BY total_sales DESC  
LIMIT 1;
```

	unit_price_range text	total_sales numeric
1	70-80	240195.44
2	60-70	214650.81
3	50-60	171496.67
4	80-90	154939.37
5	40-50	136983.45
6	30-40	108577.20
7	20-30	81435.28
8	90-100	66524.10
9	10-20	34924.06

## --🛒 Customer & Product Behavior

--What is the average quantity sold per invoice?

```
SELECT ROUND(SUM(total)::numeric, 2)/count(invoice_id) as avg_quant_sold  
FROM cm_orders
```

	avg_quant_sold numeric
1	0.01217273547998796268

--Which hour of the day sees the highest sales?

```
SELECT TO_CHAR(time::time, 'HH24') AS hour,ROUND(SUM(total)::numeric, 2) as total_sales  
FROM cm_orders  
group by TO_CHAR(time::time, 'HH24')  
order by total_sales DESC
```

	hour text	total_sales numeric
1	15	142016.77
2	16	134918.07
3	19	128581.06
4	17	116301.16
5	18	113072.80
6	20	109066.74
7	13	66288.74
8	14	61472.38
9	10	60756.22
10	11	60700.79
11	12	57820.65
12	07	35325.00
13	09	34295.00

--What is the most sold category during weekends?

```
SELECT category, SUM(quantity) AS total_quantity  
,EXTRACT(DOW FROM TO_DATE(date,'DD-MM-YY')) as DOW  
FROM cm_orders  
WHERE EXTRACT(DOW FROM TO_DATE(date,'DD-MM-YY')) IN (0,6)  
GROUP BY category,EXTRACT(DOW FROM TO_DATE(date,'DD-MM-YY'))  
ORDER BY total_quantity DESC
```

	category text	total_quantity double precision	dow numeric
1	Home and lifestyle	1459	0
2	Fashion accessories	1448	6
3	Home and lifestyle	1375	6
4	Fashion accessories	1348	0
5	Electronic accessories	230	6
6	Electronic accessories	209	0
7	Sports and travel	174	6
8	Food and beverages	151	6

--What is the sales contribution of each payment method?

```
SELECT payment_method, ROUND(SUM(total)::numeric, 2) as total_sales
FROM cm_orders
group by payment_method
```

	payment_method text	total_sales numeric
1	Credit card	488821.02
2	Ewallet	457316.07
3	Cash	263589.29

--What are the top 5 product categories with highest unit\_price but low sales?

```
SELECT category, round(avg(unitprice)::numeric,2) as avg_unit_price,
ROUND(SUM(total)::numeric, 2) as total_sales
FROM cm_orders
GROUP by category
ORDER BY avg_unit_price DESC, total_sales ASC
```

	category text	avg_unit_price numeric	total_sales numeric
1	Sports and travel	56.99	52497.93
2	Food and beverages	56.01	53471.28
3	Health and beauty	54.85	46851.18
4	Electronic accessories	51.64	78175.03
5	Home and lifestyle	50.44	489250.06
6	Fashion accessories	50.12	489480.90

--Are customers buying more in mornings or evenings?

```
SELECT
CASE
  WHEN time::time > '06:00:00' AND time::time < '12:00:00' THEN 'morning'
  WHEN time::time > '18:00:00' AND time::time < '24:00:00' THEN 'evening'
  ELSE 'other'
END AS time_frame,
ROUND(SUM(total)::numeric) AS sales
FROM cm_orders
GROUP BY time_frame;
```

	time_frame text	sales numeric
1	morning	251507
2	evening	377631
3	other	580589



-- 📍 Location Analysis

--Which city performs the best in terms of revenue?

```
SELECT cm_orders."City", ROUND(SUM(total)::numeric) AS revenue
FROM cm_orders
GROUP BY cm_orders."City"
ORDER BY revenue desc
LIMIT 1;
```

	City text	revenue numeric
1	Weslaco	46352

--What is the average rating given per city?

```
SELECT cm_orders."City", round(avg(rating)::numeric,2) as avg_rating
FROM cm_orders
GROUP BY cm_orders."City"
ORDER BY avg_rating DESC
```

	City text	avg_rating numeric
1	Austin	7.00
2	Huntsville	6.81
3	Pflugerville	6.73
4	Denton	6.68
5	College Station	6.67
6	Laredo	6.64
7	Bryan	6.61
8	Alamo	6.60
9	Brownsville	6.59
10	Fort Worth	6.58
11	Cedar Park	6.57
12	Coppell	6.57
13	Frisco	6.56

--Compare profit margins across branches.

```
SELECT cm_orders."Branch", round(avg(profit_margin)::numeric,2) as profit_margin
FROM cm_orders
Group by cm_orders."Branch"
ORDER BY profit_margin desc
```

	Branch text	profit_margin numeric
1	WALM052	0.57
2	WALM051	0.52
3	WALM004	0.48
4	WALM046	0.48
5	WALM050	0.48
6	WALM007	0.48
7	WALM047	0.48
8	WALM041	0.48
9	WALM035	0.48
10	WALM018	0.48
11	WALM043	0.48
12	WALM033	0.48
13	WALM022	0.48

--What is the sales trend by city over months?

```
SELECT cm_orders."City", TO_CHAR(TO_DATE(date,'DD-MM-YY'),'MONTH') as Month,  
ROUND(SUM(total)::numeric, 2) as total_sales  
FROM cm_orders  
GROUP BY cm_orders."City",TO_CHAR(TO_DATE(date,'DD-MM-YY'),'MONTH')  
ORDER BY total_sales DESC
```

	City text	month text	total_sales numeric
1	Weslaco	DECEMBER	15373.00
2	Waxahachie	DECEMBER	14388.00
3	Waxahachie	NOVEMBER	13400.00
4	Weslaco	NOVEMBER	12630.00
5	Port Arthur	NOVEMBER	8761.00
6	Schertz	NOVEMBER	8573.00
7	Plano	NOVEMBER	8290.00
8	Round Rock	DECEMBER	7668.00
9	Sherman	NOVEMBER	7623.00
10	Schertz	DECEMBER	7585.00
11	Rockwall	DECEMBER	7431.00
12	Temple	NOVEMBER	7163.00
13	Richardson	DECEMBER	7089.00

--🇺🇸 Payment & Customer Feedback

-- Which payment method generates the highest revenue?

```
SELECT payment_method,ROUND(SUM(total)::numeric, 2) as total_sales  
FROM cm_orders  
group by payment_method  
ORDER BY total_sales DESC  
LIMIT 1
```

	payment_method text	total_sales numeric
1	Credit card	488821.02

--Is there a correlation between rating and profit margin?

```
SELECT CORR(rating::numeric, profit_margin)*100 AS correlation  
FROM cm_orders
```

	correlation double precision
1	6.591030205020536

--What's the average rating per payment method?

```
SELECT payment_method, round(avg(rating)::numeric,2) as avg_rating  
FROM cm_orders  
group by payment_method
```

	payment_method text	avg_rating numeric
1	Credit card	5.42
2	Ewallet	6.48
3	Cash	5.42

## --📅 Time Series & Seasonality

--What is the monthly growth rate in month of december?

```
WITH monthly_sales AS (  
  SELECT  
    TO_CHAR(TO_DATE(date, 'DD/MM/YY'), 'YYYY-MM') AS month,  
    SUM(total) AS total_sales  
  FROM cm_orders  
  GROUP BY TO_CHAR(TO_DATE(date, 'DD/MM/YY'), 'YYYY-MM')  
)  
december_growth AS (  
  SELECT  
    month,  
    total_sales,  
    LAG(total_sales) OVER (ORDER BY month) AS prev_month_sales  
  FROM monthly_sales  
  WHERE RIGHT(month, 2) = '11' OR RIGHT(month, 2) = '12'  
)  
SELECT  
  month,  
  total_sales,  
  prev_month_sales,  
  
  100.0 * (total_sales - prev_month_sales) / NULLIF(prev_month_sales, 0)  
  AS growth_rate_percent  
FROM december_growth  
WHERE RIGHT(month, 2) = '12';
```

	month text	total_sales double precision	prev_month_sales double precision	growth_rate_percent double precision
1	2020-12	60783	60146	1.0590895487646725
2	2021-12	66930	59628	12.24592473334675
3	2022-12	58812	61687	-4.66062541540357
4	2023-12	66092	63424	4.206609485368315

--What are the top sales days of the week?

```
SELECT  
  TO_CHAR(TO_DATE(date, 'DD-MM-YY'), 'Day') AS day_of_week,  
  ROUND(SUM(total)::numeric, 2) AS total_sales  
FROM cm_orders  
GROUP BY day_of_week  
ORDER BY total_sales DESC;
```

	day_of_week text	total_sales numeric
1	Saturday	185624.39
2	Tuesday	181217.71
3	Wednesday	174515.70
4	Thursday	174092.76
5	Sunday	171075.85
6	Friday	168103.61
7	Monday	155096.36

Which week of the month has the highest sales?

```
SELECT
  EXTRACT(WEEK FROM TO_DATE(date, 'DD-MM-YY')) AS week_number,
  ROUND(SUM(total)::numeric, 2) AS total_sales
FROM cm_orders
GROUP BY week_number
ORDER BY total_sales DESC
LIMIT 1;
```

	week_number numeric	total_sales numeric
1	48	67616.00

Which month had the lowest number of orders?

```
SELECT
  TO_CHAR(TO_DATE(date, 'DD-MM-YY'), 'Month') AS month_name,
  COUNT(invoice_id) AS total_orders
FROM cm_orders
GROUP BY month_name
ORDER BY total_orders ASC
LIMIT 1;
```

	month_name text	total_orders bigint
1	June	258
2	April	275
3	May	291
4	July	297
5	February	583
6	March	622
7	January	630
8	September	654
9	August	679
10	October	726