



CHALLENGE

ANALYSIS PROCESS

EXPLORE FURTHER

DATA ANALYSIS



Codebasics Challenge #4



# DATA ANALYSIS FOR BUSINESS

Consumer Goods Ad-Hoc Insights

SQL

created by Teodor Cristia



# Challenge #4: Provide Insights to Management in Consumer Goods Domain

**Domain:** Consumer Goods | **Function:** Executive Management

## Problem Statement:

- ◆ Atliq Hardware is a leading computer hardware producer in India that requires quick and informed decisions based on data insights.
- ◆ They need a junior data analyst with strong technical and soft skills to expand their Data Analytics team.
- ◆ The junior data analyst is tasked with generating insights and answering 10 Ad-Hoc requests.
- ◆ The insights generated will be presented to top-level management.

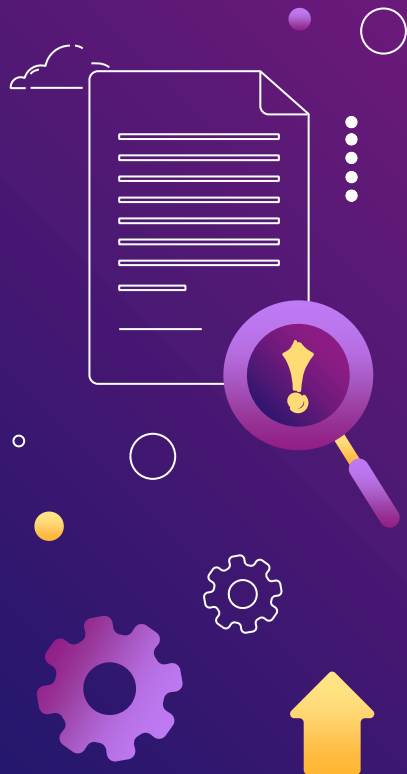




## Task

- ◆ Analyze the dataset provided using SQL to answer 10 Ad-Hoc requests.
- ◆ Generate insights based on the data and present them in a creative and engaging format.
- ◆ Use effective presentation skills to convey the insights to top-level management.
- ◆ Highlight key takeaways and insights from the analysis.
- ◆ Demonstrate strong technical and soft skills as a junior data analyst.





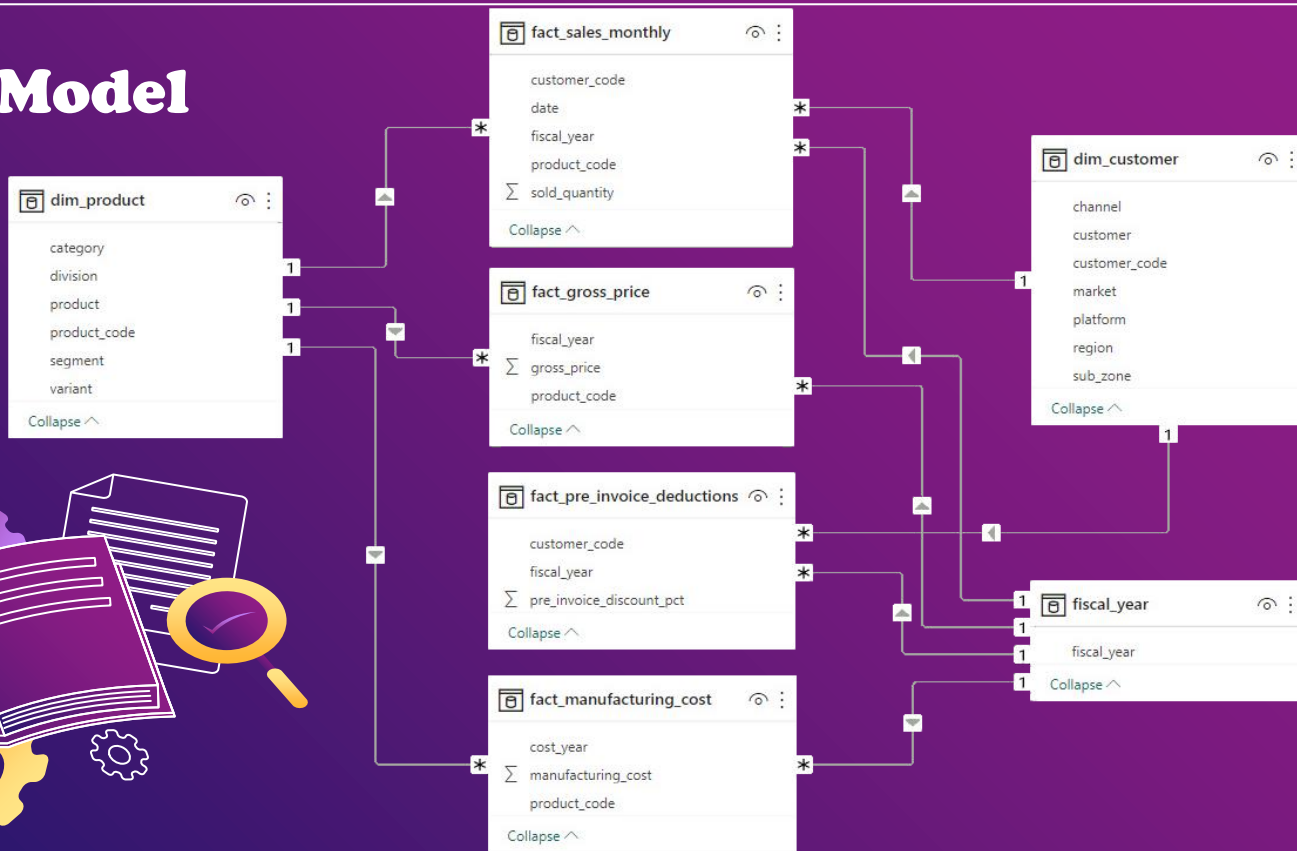
## Important Considerations

- ➔ Queries and visualizations are based on the fiscal calendar.
- ➔ The fiscal calendar at Atliq Hardware is starting in September.
- ➔ The Database provided covers the history of two fiscal years (2020 and 2021), with almost 1 million rows of data.





# Data Model





# Data Analysis Process

**01**

## Requests

Introduce the questions we aim to answer in this presentation.

**03**

## SQL Outputs

Present the results of the data retrieval process.

**05**

## Insights

Key takeaways and observations from data analysis for decision-making and useful insights.

**02**

## SQL Queries

Show the technical process used to retrieve the data.

**04**

## Results Visualizations

Highlight key insights from the data with a clear and easy-to-understand format.





## Request #1

Provide the **list** of **markets** in which **customer** "Atliq Exclusive" operates its business in the **APAC** region.





# SQL Query

```
1 • SELECT DISTINCT
2     market
3 FROM dim_customer
4 WHERE customer = 'Atliq Exclusive'
5     AND region = 'APAC'
6 ORDER BY market;
```

# SQL Output

market
▶ Australia
Bangladesh
India
Indonesia
Japan
Newzealand
Philiphines
South Korea







# Results Visualization



## Insights

- Atliq Exclusive customer operates its business in 8 markets across the APAC region, including **Australia**, **Bangladesh**, **India**, **Indonesia**, **Japan**, **New Zealand**, **Philippines**, and **South Korea**.
  - Analyzing the **quantity sold** and **gross sales** in each market can reveal its importance to customer **Atliq Exclusive** in terms of revenue and growth potential in the **APAC** region.
- ➡ Now, let's take the next step forward and explore it...





# SQL Query

```
1 WITH atliq_exclusive_apac AS (  
2     SELECT  
3         c.market,  
4         SUM(s.sold_quantity) AS total_sold_quantity,  
5         ROUND(  
6             SUM(s.sold_quantity * gp.gross_price) / 1000000, 2  
7         ) AS gross_sales_mln  
8     FROM fact_sales_monthly s  
9     JOIN fact_gross_price gp  
10        ON s.product_code = gp.product_code  
11        AND s.fiscal_year = gp.fiscal_year  
12     JOIN dim_customer c  
13        ON s.customer_code = c.customer_code  
14     WHERE customer = 'Atliq Exclusive'  
15        AND region = 'APAC'  
16     GROUP BY market  
17 )  
18 SELECT  
19     market,  
20     ROUND(  
21         total_sold_quantity / SUM(total_sold_quantity) OVER() * 100, 2  
22     ) AS sold_qty_percentage,  
23     gross_sales_mln  
24 FROM atliq_exclusive_apac  
25 ORDER BY gross_sales_mln DESC;
```



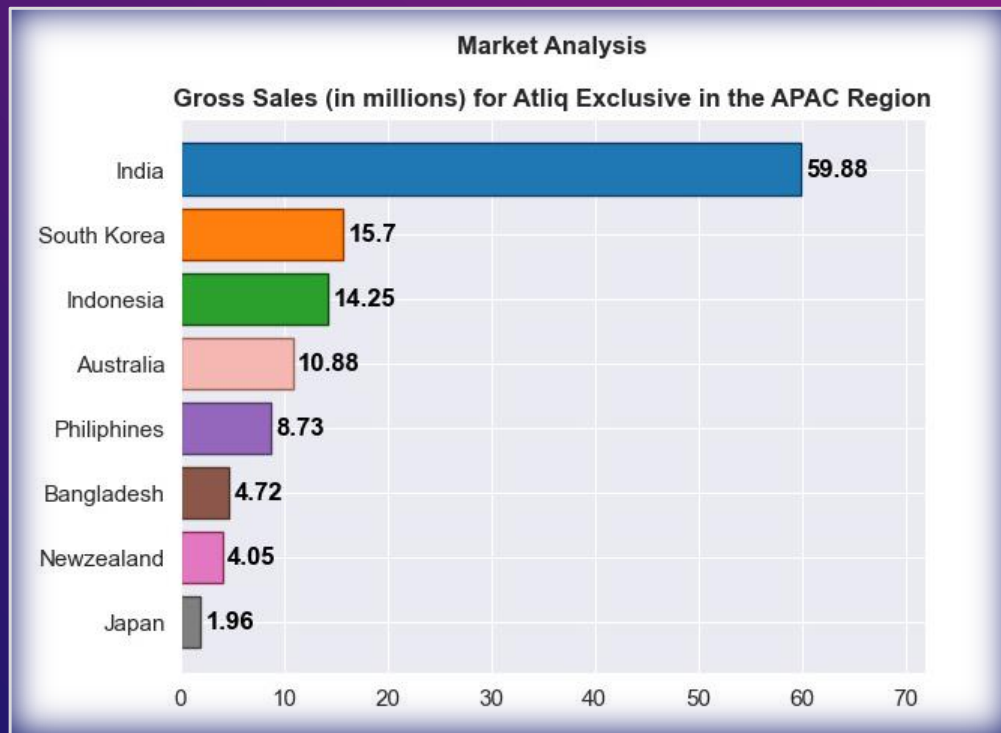
# SQL Output

	market	sold_qty_percentage	gross_sales_mln
▶	India	50.04	59.88
	South Korea	13.14	15.70
	Indonesia	11.65	14.25
	Australia	9.05	10.88
	Philippines	7.19	8.73
	Bangladesh	3.91	4.72
	Newzealand	3.36	4.05
	Japan	1.66	1.96





# Results Visualization



## Insights

- **India** is by far the most important market for customer Atliq Exclusive, accounting for more than half of the sold quantity and gross sales in the APAC region.
- **South Korea** and **Indonesia** are the next two largest markets for Atliq Exclusive, with each accounting for over 10% of the sold quantity and gross sales.
- **Japan** has the smallest sold quantity percentage and gross sales figure among the markets.





## Request #2

What is the **percentage of unique product increase** in 2021 vs. 2020?

The final output contains these fields:

- ✦ **unique\_products\_2020**
- ✦ **unique\_products\_2021**
- ✦ **percentage\_chg**





## SQL Query

```
1 WITH unique_products AS (  
2     SELECT  
3         COUNT(DISTINCT CASE WHEN fiscal_year = 2020 THEN product_code END) AS unique_products_2020,  
4         COUNT(DISTINCT CASE WHEN fiscal_year = 2021 THEN product_code END) AS unique_products_2021  
5     FROM fact_sales_monthly  
6 )  
7 SELECT  
8     unique_products_2020,  
9     unique_products_2021,  
10    ROUND(  
11        (unique_products_2021 - unique_products_2020) * 100.0 / unique_products_2020, 2  
12    ) AS percentage_chg  
13 FROM unique_products;
```

## SQL Output

	unique_products_2020	unique_products_2021	percentage_chg
▶	245	334	36.33





# Results Visualization



## Insights

- The number of unique products increased from **245** in 2020 to **334** in 2021, which represents a significant increase of **36.33%**.
- The increase in the number of unique products from 2020 to 2021 indicates that the business is expanding its product offerings, which may lead to increased sales and revenue.





## Request #3

Provide a report with **all** the **unique product counts** for **each segment** and **sort them** in **descending order** of **product counts**.

The final output contains 2 fields:

- ✦ **segment**
- ✦ **product\_count**







# SQL Query

```
1 • SELECT
2     p.segment,
3     COUNT(DISTINCT s.product_code) AS product_count
4 FROM fact_sales_monthly s
5 JOIN dim_product p
6     ON s.product_code = p.product_code
7 GROUP BY p.segment
8 ORDER BY product_count DESC;
```

# SQL Output

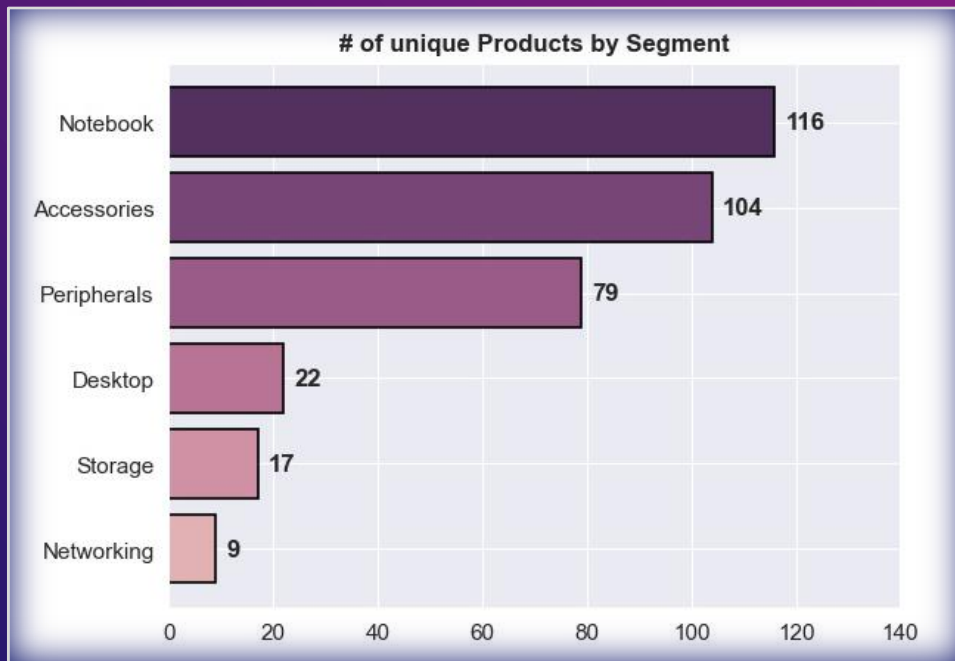
	segment	product_count
▶	Notebook	116
	Accessories	104
	Peripherals	79
	Desktop	22
	Storage	17
	Networking	9







# Results Visualization



## Insights

- The **Notebook** segment has the highest number of products, with a count of **116**. This suggests that this is a key area of focus for the business.
- **Accessories** is the second largest segment with **104** products.
- **Networking** has the lowest product count with only **9** products.





## Request #4

Follow-up: Which **segment** had the **most increase** in **unique products** in **2021 vs 2020**?

The final output contains these fields:

- ✦ **segment**
- ✦ **product\_count\_2020**
- ✦ **product\_count\_2021**
- ✦ **difference**





# SQL Query

```
1 WITH segment_products AS (  
2     SELECT  
3         p.segment,  
4         COUNT(DISTINCT CASE WHEN fiscal_year = 2020 THEN s.product_code END) AS product_count_2020,  
5         COUNT(DISTINCT CASE WHEN fiscal_year = 2021 THEN s.product_code END) AS product_count_2021,  
6         COUNT(DISTINCT CASE WHEN fiscal_year = 2021 THEN s.product_code END) -  
7         COUNT(DISTINCT CASE WHEN fiscal_year = 2020 THEN s.product_code END) AS difference  
8     FROM fact_sales_monthly s  
9     JOIN dim_product p  
10        ON p.product_code = s.product_code  
11    WHERE fiscal_year IN (2020, 2021)  
12    GROUP BY p.segment  
13 )  
14 SELECT  
15     *  
16 FROM segment_products  
17 WHERE difference = (  
18     SELECT MAX(difference)  
19     FROM segment_products  
20 );
```



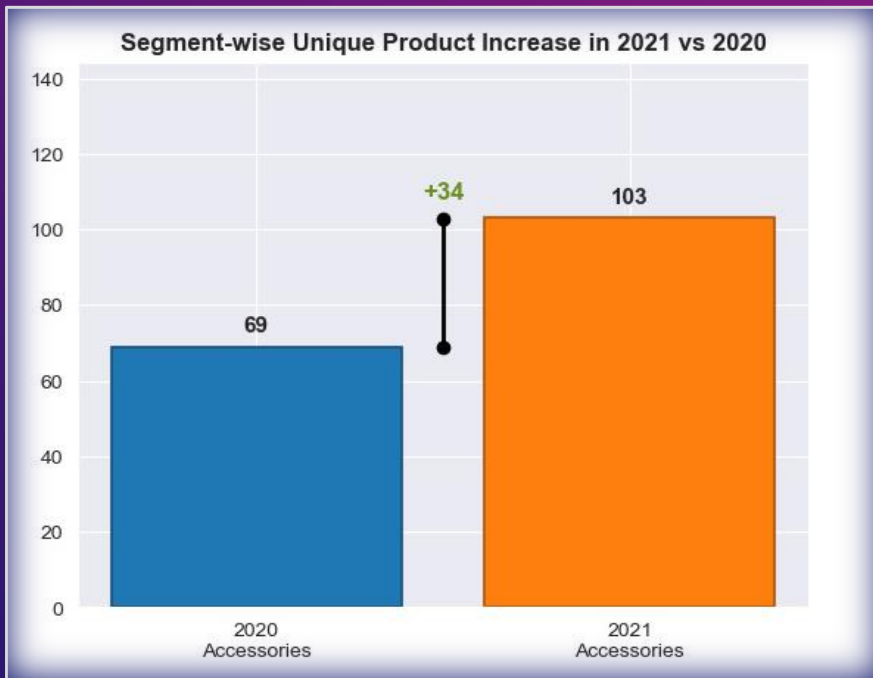
# SQL Output

	segment	product_count_2020	product_count_2021	difference
▶	Accessories	69	103	34





# Results Visualization



## Insights

- **Accessories** segment had the most increase in unique products in 2021 compared to 2020, with a difference of **34** products. In 2020, the segment had **69** unique products, while in 2021, it had **103** unique products.





## Request #5

Get the **products** that have the **highest** and **lowest manufacturing costs**.

The final output should contain these fields:

- ✦ **product\_code**
- ✦ **product**
- ✦ **manufacturing\_cost**





# SQL Query

```
1 • SELECT
2     m.product_code,
3     p.category,
4     CONCAT(p.product, " - ", p.variant) AS product_name,
5     m.manufacturing_cost
6 FROM fact_manufacturing_cost m
7 JOIN dim_product p
8     ON m.product_code = p.product_code
9 WHERE m.manufacturing_cost IN (
10     (SELECT MIN(manufacturing_cost) FROM fact_manufacturing_cost),
11     (SELECT MAX(manufacturing_cost) FROM fact_manufacturing_cost)
12 );
```

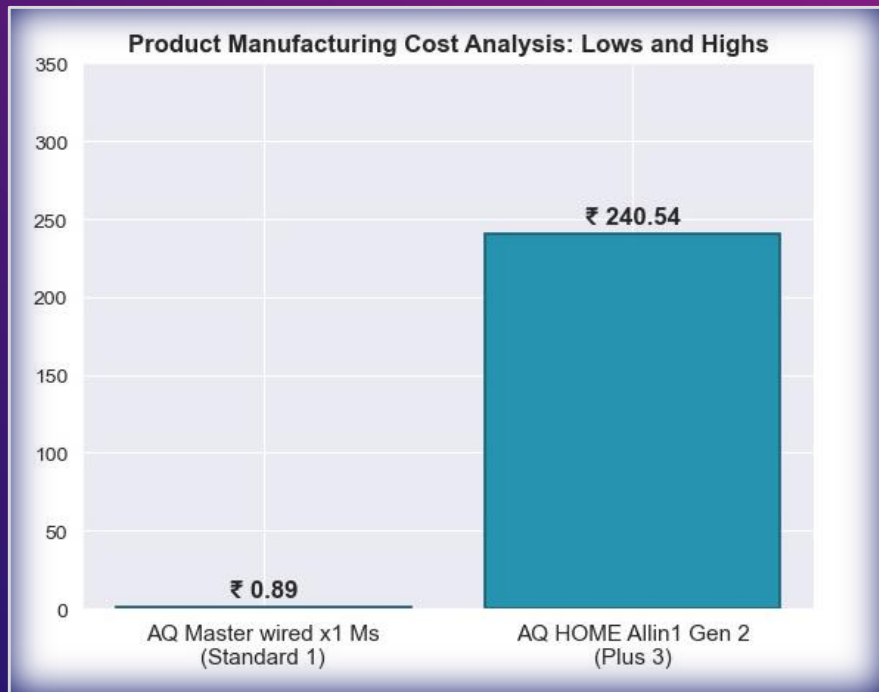
# SQL Output

	product_code	category	product_name	manufacturing_cost
▶	A2118150101	Mouse	AQ Master wired x1 Ms - Standard 1	0.8920
	A6120110206	Personal Desktop	AQ HOME Allin1 Gen 2 - Plus 3	240.5364





# Results Visualization



## Insights

- The minimum manufacturing cost is ₹ 0.8920 and it's a **Mouse** product, which is likely a relatively simple or low-cost device.
- The maximum manufacturing cost is ₹ 240.5364, it is a **Personal Desktop** product, which is likely more complex or higher-end.





## Request #6

Generate a report which contains the **top 5 customers** who received an **average high pre\_invoice\_discount\_pct** for the **fiscal year 2021** and in the **Indian market**.

The final output contains these fields:

- ✦ **customer\_code**
- ✦ **customer**
- ✦ **average\_discount\_percentage**







# SQL Query

```
1 • WITH ranked_india_customers_2021 AS (  
2     SELECT  
3         c.customer_code,  
4         c.customer,  
5         pre_invoice_discount_pct,  
6         DENSE_RANK() OVER(ORDER BY pre_invoice_discount_pct DESC) AS drnk  
7     FROM dim_customer c  
8     JOIN fact_pre_invoice_deductions pid  
9         ON c.customer_code = pid.customer_code  
10    WHERE market = "India"  
11        AND fiscal_year = 2021  
12 )  
13 SELECT  
14     customer_code,  
15     customer,  
16     pre_invoice_discount_pct  
17 FROM ranked_india_customers_2021  
18 WHERE drnk <= 5  
19     AND pre_invoice_discount_pct > (  
20         SELECT AVG(pre_invoice_discount_pct)  
21         FROM ranked_india_customers_2021  
22 );
```



# SQL Output

	customer_code	customer	pre_invoice_discount_pct
▶	90002009	Flipkart	0.3083
	90002006	Viveks	0.3038
	90002003	Ezone	0.3028
	90002002	Croma	0.3025
	90002016	Amazon	0.2933





# Results Visualization



## Insights

- These **customers** are likely to be important to the business as they are receiving a **high average discount percentage** for the fiscal year **2021** and in the **Indian** market, which could indicate that they are making large or frequent purchases.





## Request #7

Get the complete report of the **Gross sales amount** for the customer “**Atliq Exclusive**” for **each month**. This analysis helps to get an idea of **low** and **high-performing months** and take **strategic decisions**.

The final report contains these columns:

- ◆ **Month**
- ◆ **Year**
- ◆ **GrossSalesAmount**





## SQL Query

```
1 • SELECT
2     s.fiscal_year,
3     MONTHNAME( DATE_ADD(date, INTERVAL 4 MONTH) ) AS fiscal_month,
4     ROUND( SUM(s.sold_quantity * gp.gross_price) / 1000000, 2 ) AS gross_sales_amount_mln
5 FROM fact_sales_monthly s
6 JOIN fact_gross_price gp
7     ON s.product_code = gp.product_code
8     AND s.fiscal_year = gp.fiscal_year
9 JOIN dim_customer c
10    ON s.customer_code = c.customer_code
11 WHERE c.customer = "Atliq Exclusive"
12 GROUP BY fiscal_year, fiscal_month
13 ORDER BY gross_sales_amount_mln DESC;
```

## SQL Output

	fiscal_year	fiscal_month	gross_sales_amount_mln
▶	2021	March	20.46
	2021	February	13.22
	2021	April	12.94
	2021	May	12.40
	2021	January	12.35
	2021	September	12.15
	2021	July	12.14
	2021	November	12.09
	2021	June	10.13
	2021	October	9.82
	2020	March	7.52
	2021	August	7.31
	2021	December	7.18
	2020	February	5.14
	2020	April	4.83
	2020	May	4.74
	2020	January	4.50
	2020	June	4.00
	2020	December	2.79
	2020	November	2.55
	2020	October	1.70
	2020	September	0.78
	2020	August	0.40
	2020	July	0.38





# Results Visualization



## Insights

- The **gross sales amount** has been increasing for **all months** in the fiscal year **2021** compared to the same months in the previous year 2020.
- The **highest gross sales amount** was recorded in **March 2021**, followed by **February** and **April 2021**.
- The **lowest gross sales amount** was recorded in **July** and **August 2020**.





## Request #8

In which **quarter** of **2020**, got the **maximum total\_sold\_quantity**?

The final output contains these fields **sorted** by the **total\_sold\_quantity**:

- ♦ **quarter**
- ♦ **total\_sold\_quantity**



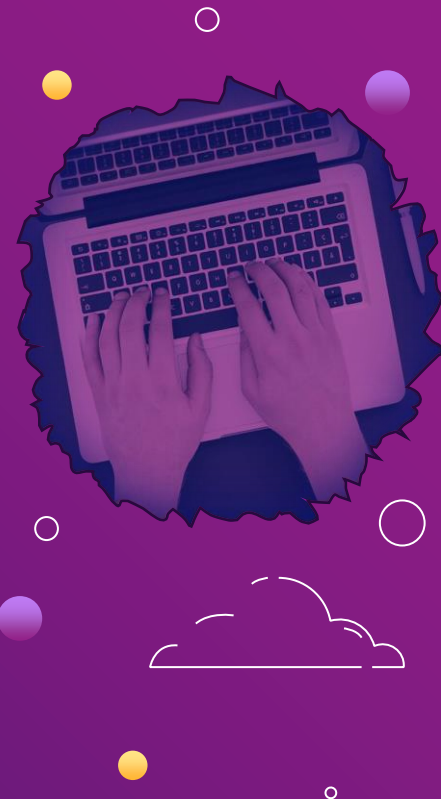


## SQL Query

```
1 • SELECT
2   CONCAT("Q",
3     QUARTER( DATE_ADD(date, INTERVAL 4 MONTH) )
4     ) AS fiscal_quarter,
5     FORMAT( SUM(sold_quantity), 0) AS total_sold_quantity
6 FROM fact_sales_monthly
7 WHERE fiscal_year = 2020
8 GROUP BY fiscal_quarter
9 ORDER BY SUM(sold_quantity) DESC;
```

## SQL Output

	fiscal_quarter	total_sold_quantity
►	Q1	7,005,619
	Q2	6,649,642
	Q4	5,042,541
	Q3	2,075,087







# Results Visualization



## Insights

- The maximum total sold quantity in 2020 was in Q1 with 7,005,619 units sold, followed by Q2 with 6,649,642 units sold, and then Q4 with 5,042,541 units sold.
- The lowest total sold quantity was in Q3 with 2,075,087 units sold.







## Request #9

Which **channel** helped to bring more **gross sales** in the **fiscal year 2021** and the **percentage** of **contribution**?

The final output contains these fields:

- ✦ **channel**
- ✦ **gross\_sales\_mln**
- ✦ **percentage**





# SQL Query

```
1 WITH channel_gross_sales AS (  
2     SELECT  
3         c.channel,  
4         ROUND(  
5             SUM(s.sold_quantity * gp.gross_price) / 1000000, 2  
6         ) AS gross_sales_mln  
7     FROM fact_sales_monthly s  
8     JOIN dim_customer c  
9         ON s.customer_code = c.customer_code  
10    JOIN fact_gross_price gp  
11        ON s.product_code = gp.product_code  
12        AND s.fiscal_year = gp.fiscal_year  
13    WHERE s.fiscal_year = 2021  
14    GROUP BY c.channel  
15 )  
16 SELECT  
17     channel,  
18     gross_sales_mln,  
19     ROUND(  
20         gross_sales_mln / SUM(gross_sales_mln) OVER() * 100, 2  
21     ) AS percentage  
22 FROM channel_gross_sales  
23 ORDER BY percentage DESC;
```



# SQL Output

	channel	gross_sales_mln	percentage
▶	Retailer	1219.08	73.23
	Direct	257.53	15.47
	Distributor	188.03	11.30

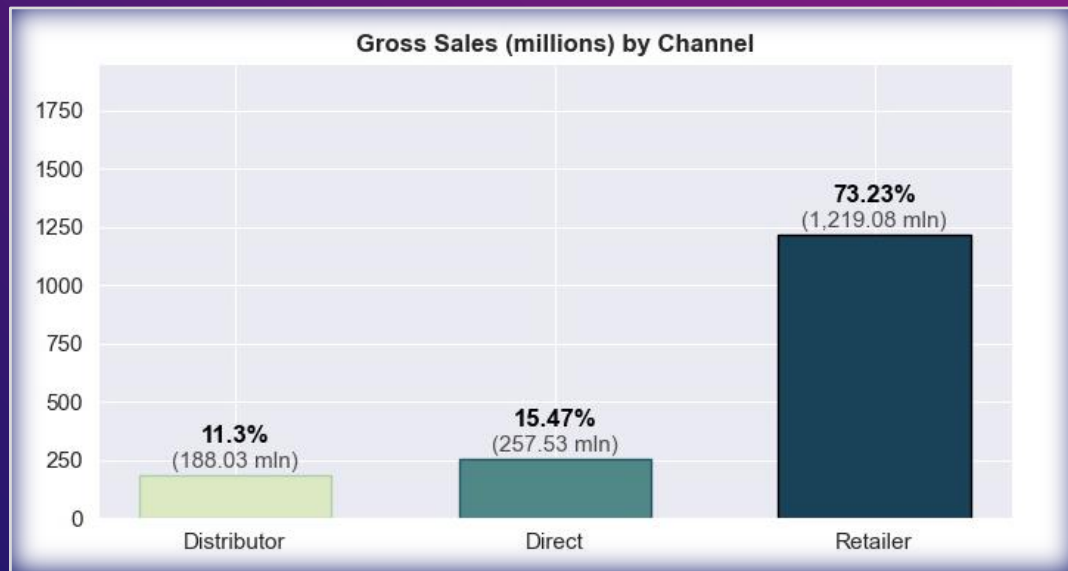




# Results Visualization

## Insights

- The **retailer** channel was the **main contributor** to the gross sales in the fiscal year **2021**, accounting for **73.23%** of the total gross sales.
- The **direct** channel accounted for **15.47%** of the gross sales, which is significantly lower than the retailer channel.
- The **distributor** channel had the smallest contribution to the gross sales, accounting for only **11.30%** of the total gross sales.





## Request #10

Get the **Top 3 products** in **each division** that have a **high total\_sold\_quantity** in the **fiscal\_year 2021**?

The final output contains these fields:

- ✦ **division**
- ✦ **product\_code**





# SQL Query

```
1 WITH division_sold_qty AS (  
2     SELECT  
3         p.division,  
4         p.product_code,  
5         FORMAT(SUM(s.sold_quantity), 0) AS total_sold_quantity,  
6         DENSE_RANK() OVER(  
7             PARTITION BY division  
8             ORDER BY SUM(s.sold_quantity) DESC  
9         ) AS drnk  
10    FROM fact_sales_monthly s  
11   JOIN dim_product p  
12     ON s.product_code = p.product_code  
13  WHERE fiscal_year = 2021  
14  GROUP BY p.division, p.product_code  
15 )  
16 SELECT  
17     d.division,  
18     d.product_code,  
19     CONCAT(p.product, ' - ', p.variant) AS product_name,  
20     d.total_sold_quantity  
21  FROM division_sold_qty d  
22  JOIN dim_product p  
23    ON d.product_code = p.product_code  
24  WHERE drnk <= 3  
25  ORDER BY division ASC, total_sold_quantity DESC;
```



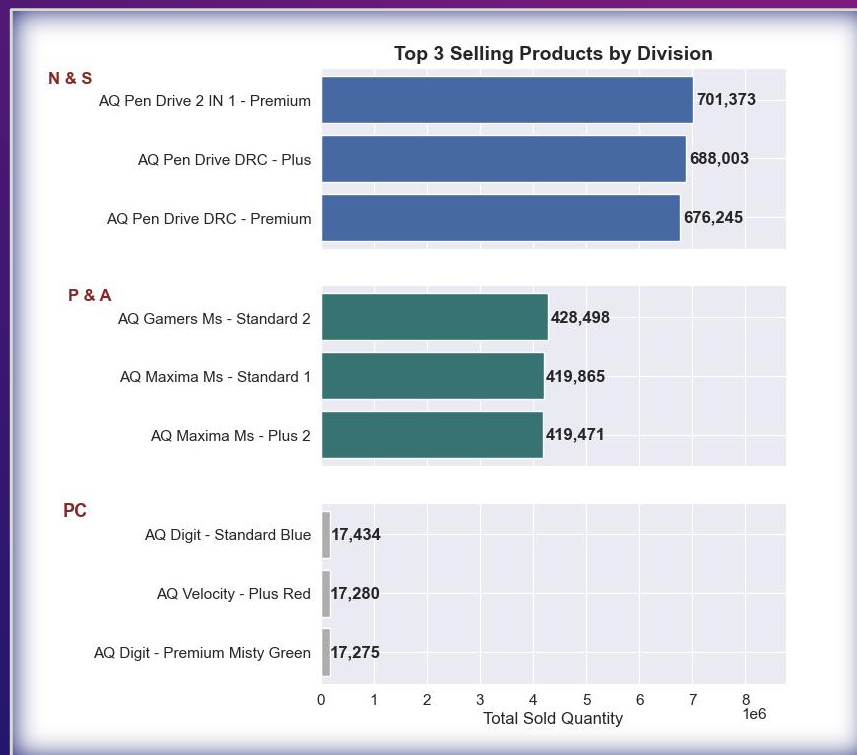
# SQL Output

	division	product_code	product_name	total_sold_quantity
▶	N & S	A6720160103	AQ Pen Drive 2 IN 1 - Premium	701,373
	N & S	A6818160202	AQ Pen Drive DRC - Plus	688,003
	N & S	A6819160203	AQ Pen Drive DRC - Premium	676,245
	P & A	A2319150302	AQ Gamers Ms - Standard 2	428,498
	P & A	A2520150501	AQ Maxima Ms - Standard 1	419,865
	P & A	A2520150504	AQ Maxima Ms - Plus 2	419,471
	PC	A4218110202	AQ Digit - Standard Blue	17,434
	PC	A4319110306	AQ Velocity - Plus Red	17,280
	PC	A4218110208	AQ Digit - Premium Misty Green	17,275





# Results Visualization



## Insights



- The **top-selling products** in each **division** have significantly **high total sold quantity** in the fiscal year **2021**.
- The **N & S division** has three products that stand out in terms of total sold quantity, with each product selling over **670,000 units** in the given fiscal year.
- The **P & A division's** top-selling products have a relatively lower total sold quantity than the top-selling products of the N & S division, with the highest-selling product selling around **428,000 units**.
- The **PC division** has a significantly lower total sold quantity than the other two divisions, with the highest-selling product selling only around **17,000 units**.





# Key Insights I

- Atliq Exclusive customer has 8 markets across the APAC region: **Australia**, **Bangladesh**, **India**, **Indonesia**, **Japan**, **New Zealand**, **Philippines**, and **South Korea**.
- **India** is **by far the most important market** for customer Atliq Exclusive, accounting for more than half of the sold quantity and gross sales in the APAC region. **Japan** has the smallest sold quantity percentage and gross sales figure among the markets.
- The number of unique products increased from **245** in 2020 to **334** in 2021, which represents a significant increase of **36.33%**.
- The **Notebook** segment has the highest number of products, with a count of **116**. This suggests that this is a key area of focus for the business. **Networking** has the lowest product count with only **9** products.

1

- **Accessories** segment had the most increase in unique products in 2021 compared to 2020, with a difference of **34** products. In 2020, the segment had **69** unique products, while in 2021, it had **103** unique products.
- The maximum manufacturing cost is **₹ 240.5364**, it is a **Personal Desktop** product. The minimum manufacturing cost is **₹ 0.8920** and it's a **Mouse** product.
- These **customers**: **Flipkart**, **Viveks**, **Ezone**, **Croma**, and **Amazon** are likely to be important to the business as they receive a **high average discount percentage** of around **30%** each for the fiscal year **2021** and in the **Indian** market.
- The **gross sales amount** has been increasing for **all months** in the fiscal year **2021** compared to the same months in the previous year 2020.

2







## Key Insights II

- The **highest gross sales amount** was recorded in **March 2021**, followed by **February** and **April 2021**.
- The **lowest gross sales amount** was recorded in **July** and **August 2020**.
- The **maximum total sold quantity** in 2020 was in **Q1** with **7,005,619** units sold, followed by Q2 with 6,649,642 units sold, and then Q4 with 5,042,541 units sold. The lowest total sold quantity was in Q3 with 2,075,087 units sold.
- The **retailer** channel was the **main contributor** to the gross sales in the fiscal year **2021**, accounting for **73.23%** of the total gross sales.
- The **direct** channel accounted for **15.47%** of the gross sales, which is significantly lower than the retailer channel.

3

- The **distributor** channel had the smallest contribution to the gross sales, accounting for only **11.30%** of the total gross sales.
- The **top-selling products** in each **division** have significantly **high total sold quantity** in the fiscal year **2021**.
- The **N & S division** has three products that stand out in terms of total sold quantity, with each product selling over **670,000 units** in the given fiscal year.
- The **P & A division's** top-selling products have a relatively lower total sold quantity than the top-selling products of the N & S division, with the highest-selling product selling around **428,000 units**.
- The **PC division** has a significantly lower total sold quantity than the other two divisions, with the highest-selling product selling only around **17,000 units**.

4







# Tools used in my project

used to create the presentation and present information in a visually engaging way



used to store, manage, and retrieve data, and solve all data requests in the presentation



used for editing and refining the visuals in the presentation, which includes the ability to crop images



used to create visualizations for a few of the requests in the presentation, providing a great view of the data



used to create the majority of the visualizations, displaying the data in a visually impactful and intuitive way





# THANK YOU!



[linkedin.com/in/teodor-cristia](https://linkedin.com/in/teodor-cristia)



[github.com/Teodor-Cristia/Portfolio](https://github.com/Teodor-Cristia/Portfolio)



[codebasics.io/challenge/codebasics-resume-project-challenge](https://codebasics.io/challenge/codebasics-resume-project-challenge)

CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon** and infographics & images by **Freepik**

