



Ad Hoc Insights

Consumer Goods

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Objectives

- Atliq Hardware (fictitious corporation) is one of the major computer hardware manufacturers in India, with a strong presence in other nations.
- Nevertheless, the management did note that they do not have sufficient insights to make prompt, wise, and data-informed judgments.
- Plan to expand the data analytics team by adding junior data analysts.
- To assess candidates, Data analytics director, Tony Sharma plans to conduct a SQL challenge to evaluate both tech and soft skills.
- The company seeks insights for 10 ad hoc requests.

Company Details

Atliq Hardware is a computer hardware and accessory manufacturer.

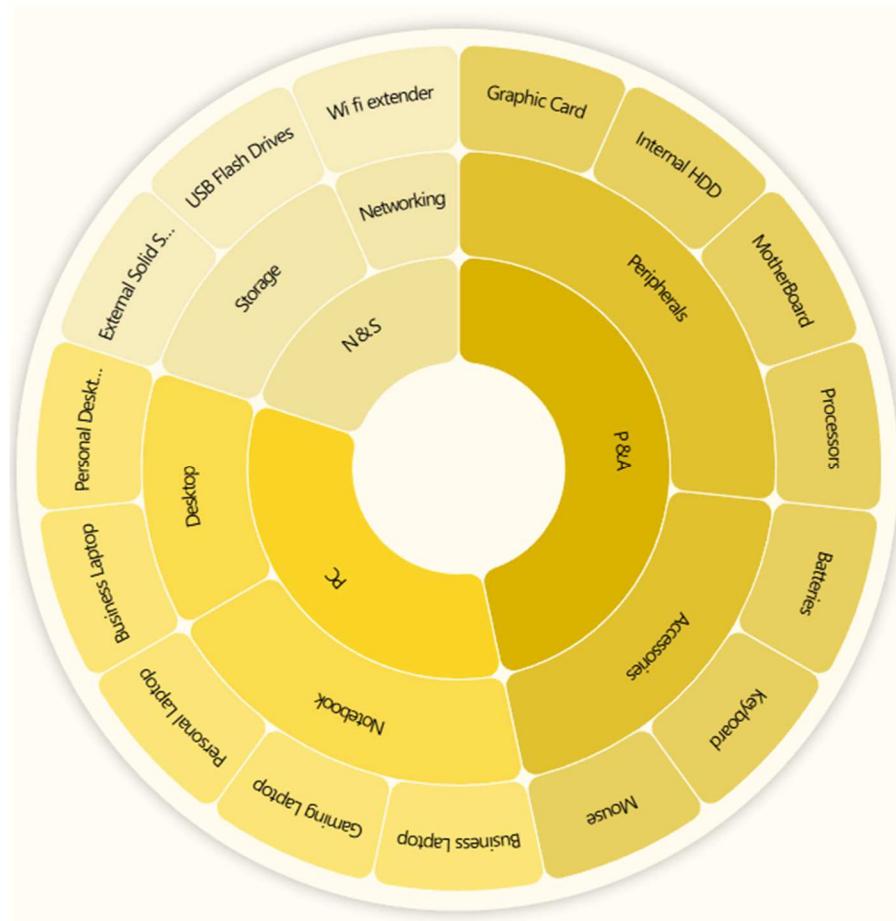
Fiscal Year

September 2019 – August 2020

FY 2020

September 2020 – August 2021

FY 2021



Outer Circle: Category

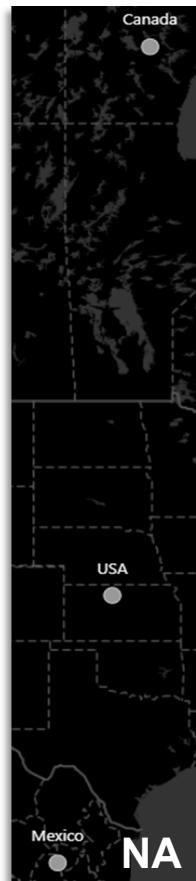


Mid Circle: Segment

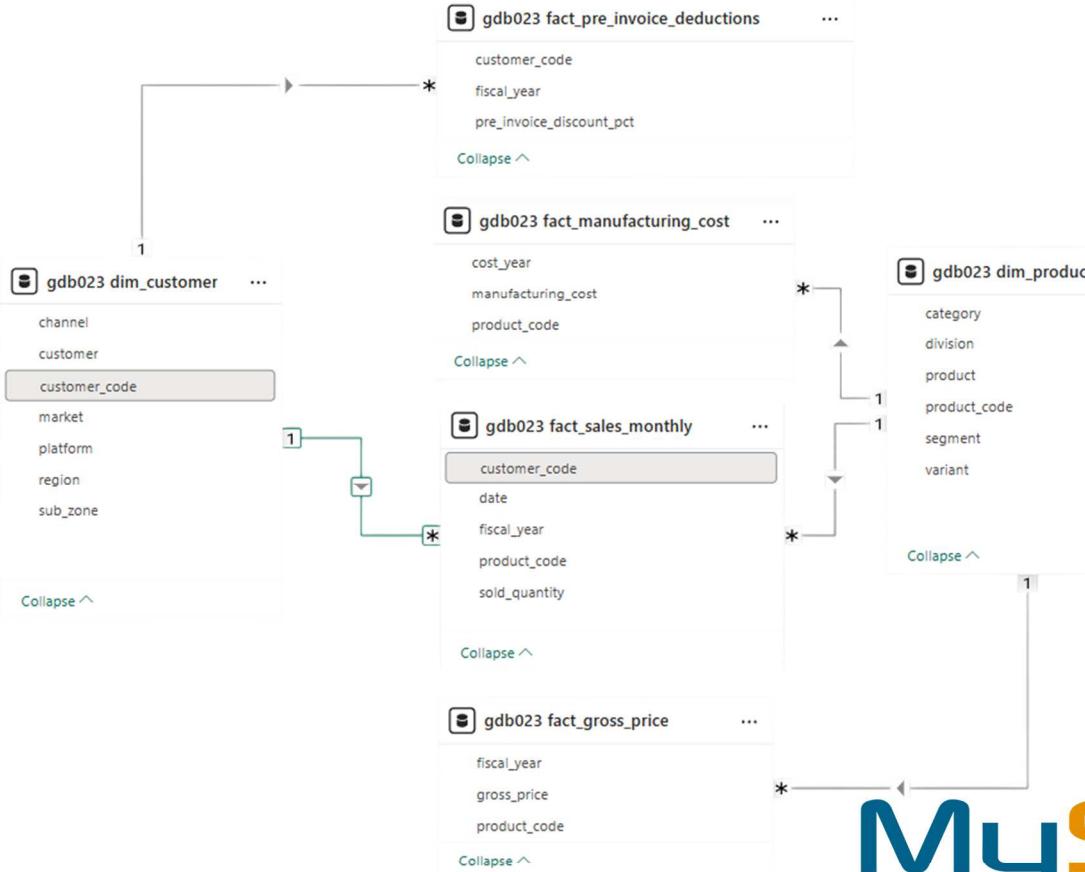


Inner Circle: Division

Company's Market



Data, Requests and Tools



Codebasics SQL Challenge

Requests:

- Provide the list of markets in which customer "Atiq Exclusive" operates its business in the APAC region.
- 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
- 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
- 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
- Get the products that have the highest and lowest manufacturing costs. The final output should contain these fields,
product_code
product
manufacturing_cost
- 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
- Get the complete report of the Gross sales amount for the customer "Atiq 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
Gross sales Amount
- 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
- 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
- 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



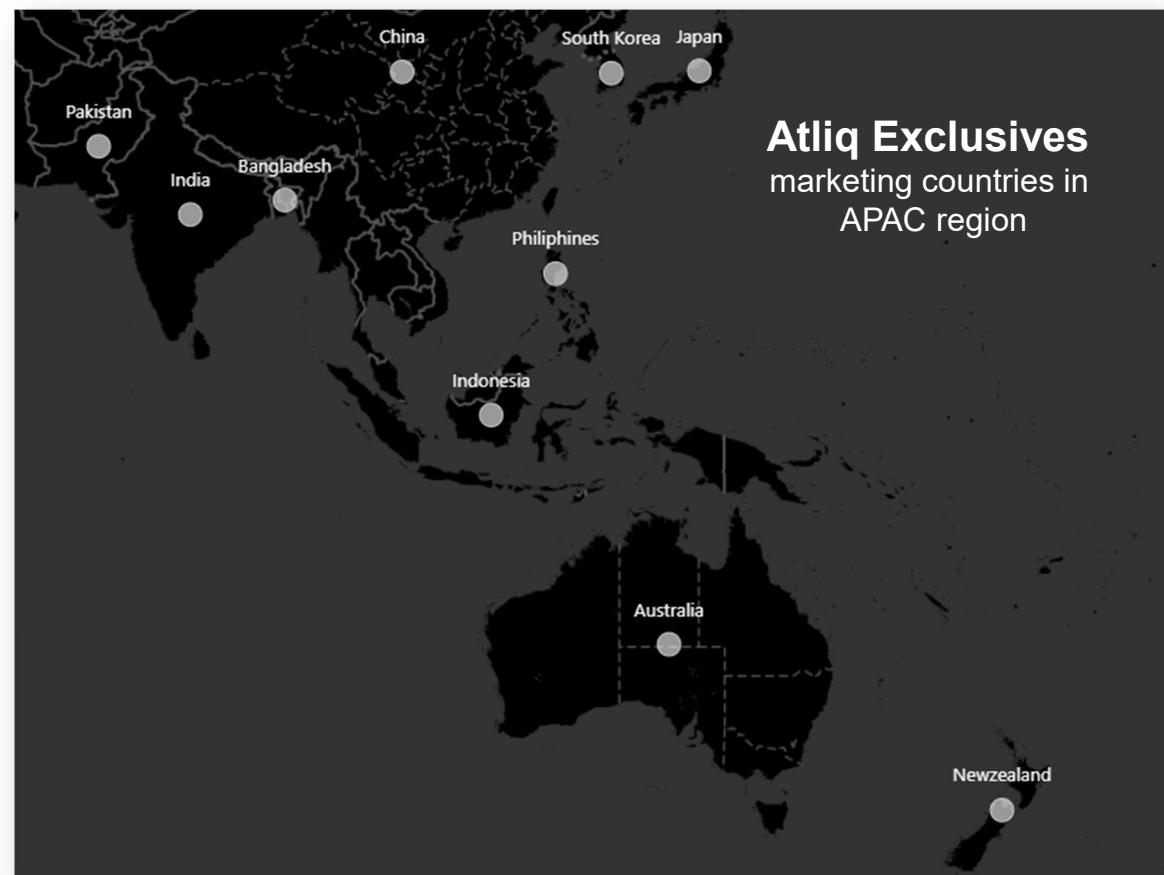
For Analysis and visualization:

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



```
SELECT DISTINCT  
    (market)  
FROM  
    dim_customer  
WHERE  
    region = 'APAC'
```

market
▶ India
Indonesia
Japan
Pakistan
Philippines
South Korea
Australia
Newzealand
Bangladesh
China



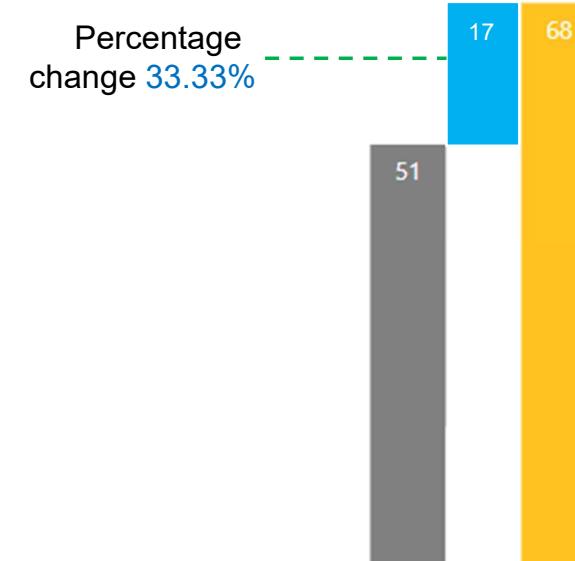
2.What is the percentage of unique product increase in 2021 vs. 2020? The final output contains these fields,

unique_products_2020
unique_products_2021
percentage_chg

```
SELECT
  (SELECT
    COUNT(DISTINCT dim_product.product)
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2020) AS unique_products_2020,
  (SELECT
    COUNT(DISTINCT dim_product.product)
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2021) AS unique_products_2021,
  ((SELECT
    COUNT(DISTINCT dim_product.product)
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2021) - (SELECT
      COUNT(DISTINCT dim_product.product))
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2021) / NULLIF((SELECT
      COUNT(DISTINCT dim_product.product))
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2020)) / NULLIF((SELECT
      COUNT(DISTINCT dim_product.product))
    FROM
      fact_sales_monthly
      JOIN
        dim_product ON fact_sales_monthly.product_code = dim_product.product_code
    WHERE
      fact_sales_monthly.fiscal_year = 2020),
  0) * 100) AS percentage_change;
```

Unique products 2020 Vs Unique products 2021

	unique_products_2020	unique_products_2021	percentage_change
▶	51	68	33.333



Insight:

- Demand and production both increased

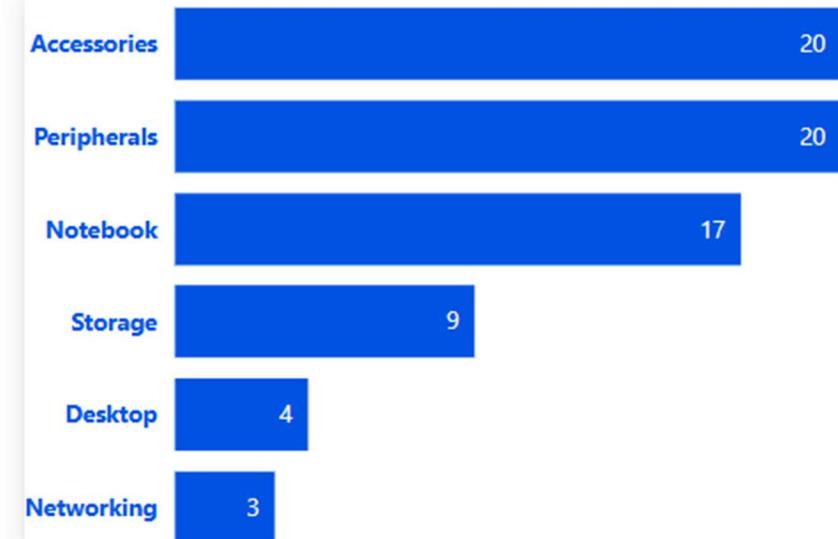
**3. Provide a report with all the unique product counts for each segment and sort them in descending order of product counts.
The final output contains 2 fields: segment, product_count**



```
SELECT
    segment, COUNT(DISTINCT (product)) AS product_count
FROM
    dim_product
GROUP BY segment
ORDER BY product_count DESC;
```

segment	product_count
Accessories	20
Peripherals	20
Notebook	17
Storage	9
Desktop	4
Networking	3

Unique product count for each segment



Insights:

- Segments: notebooks, accessories, and peripherals are showing significant manufacturing growth as compared to desktops, storage, and networking.
- Notebooks, accessories, and peripherals constitute 83% of the total manufactured product.

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



```
SELECT
    dp.segment,
    COUNT(DISTINCT CASE
        WHEN fsm.fiscal_year = 2020 THEN fsm.product_code
    END) AS uni_2020,
    COUNT(DISTINCT CASE
        WHEN fsm.fiscal_year = 2021 THEN fsm.product_code
    END) AS uni_2021,
    COUNT(DISTINCT CASE
        WHEN fsm.fiscal_year = 2021 THEN fsm.product_code
    END) - COUNT(DISTINCT CASE
        WHEN fsm.fiscal_year = 2020 THEN fsm.product_code
    END) AS difference
FROM
    fact_sales_monthly fsm
    JOIN
        dim_product dp ON fsm.product_code = dp.product_code
GROUP BY
    dp.segment
ORDER BY
    segment ASC;
```

	segment	uni_2020	uni_2021	difference
▶	Accessories	69	103	34
	Desktop	7	22	15
	Networking	6	9	3
	Notebook	92	108	16
	Peripherals	59	75	16
	Storage	12	17	5

Unique product difference per segment from 2020 to 2021

Segment	Product count 2020	Product count 2021	Difference
Accessories	69	103	34
Desktop	7	22	15
Networking	6	9	3
Notebook	92	108	16
Peripherals	59	75	16
Storage	12	17	5

Insights:

- **Accessories** had the **largest** increase in production.
- **Storage and networking** are experiencing slower production growth than other segments.

5. Get the products that have the highest and lowest manufacturing costs. The final output should contain these fields, product_code, product manufacturing_cost

```
(SELECT
    dp.product_code AS Product_code,
    dp.product AS Product,
    fmc.manufacturing_cost AS Cost,
    'Min Cost' AS Cost_Type
FROM
    fact_manufacturing_cost fmc
    JOIN
        dim_product dp ON fmc.product_code = dp.product_code
ORDER BY fmc.manufacturing_cost ASC
LIMIT 1) UNION ALL (SELECT
    dp.product_code AS Product_code,
    dp.product AS Product,
    fmc.manufacturing_cost AS Cost,
    'Max Cost' AS Cost_Type
FROM
    fact_manufacturing_cost fmc
    JOIN
        dim_product dp ON fmc.product_code = dp.product_code
ORDER BY fmc.manufacturing_cost DESC
LIMIT 1);
```

	Product_code	Product	Cost	Cost_Type
▶	A2118150101	AQ Master wired x1 Ms	0.8920	Min Cost
	A6120110206	AQ HOME Allin1 Gen 2	240.5364	Max Cost

Products having the **highest** and lowest manufacturing costs

240.54


A6120110206
AQ HOME Allin1 Gen 2
Personal Desktop

0.89


A2118150101
AQ Master wired x1 Ms
Mouse

Insights:

- Mouse: AQ Master wired x1 Ms (**Variant: Standard 1**) has the lowest manufacturing cost.
- Personal Desktop: AQ Home Allin1 Gen2 (**Variant: Plus 3**) has the highest manufacturing cost.

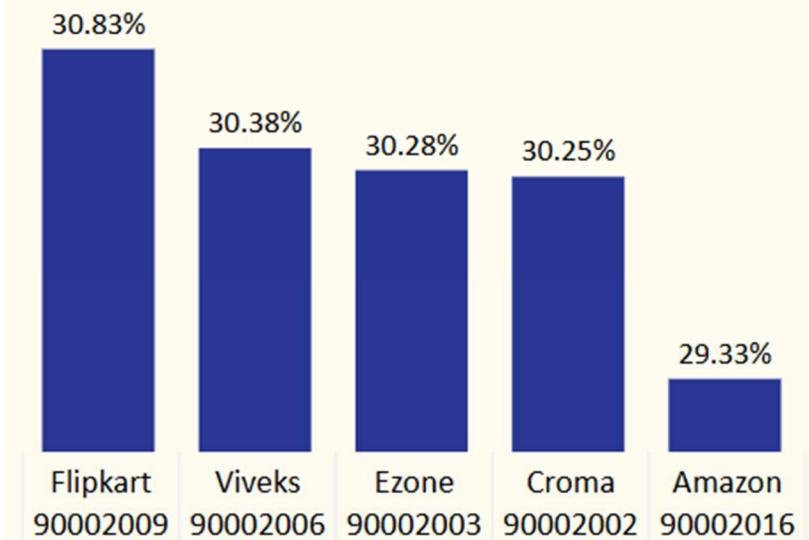
6. Generate a report which contains the top 5 customers who received an average high pre_invoice_discount_pct for the fiscal year 2021 and in the Indian market. The final output contains these fields: customer_code, customer, average_discount_percentage



```
SELECT
    dc.customer_code,
    dc.customer AS Customer,
    MAX(pid.pre_invoice_discount_pct) AS max_discount_pct
FROM
    dim_customer dc
    JOIN
        fact_pre_invoice_deductions pid ON pid.customer_code = dc.customer_code
WHERE
    dc.market = 'India'
GROUP BY dc.customer_code , dc.customer
ORDER BY max_discount_pct DESC
LIMIT 5;
```

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

Top 5 Indian customers with highest average discount percentage for FY 2021



Insights:

- The **largest** average pre-invoice discount was given to **Flipkart**.
- The **least** average pre-invoice discount was given to **Amazon**.

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, Gross sales Amount

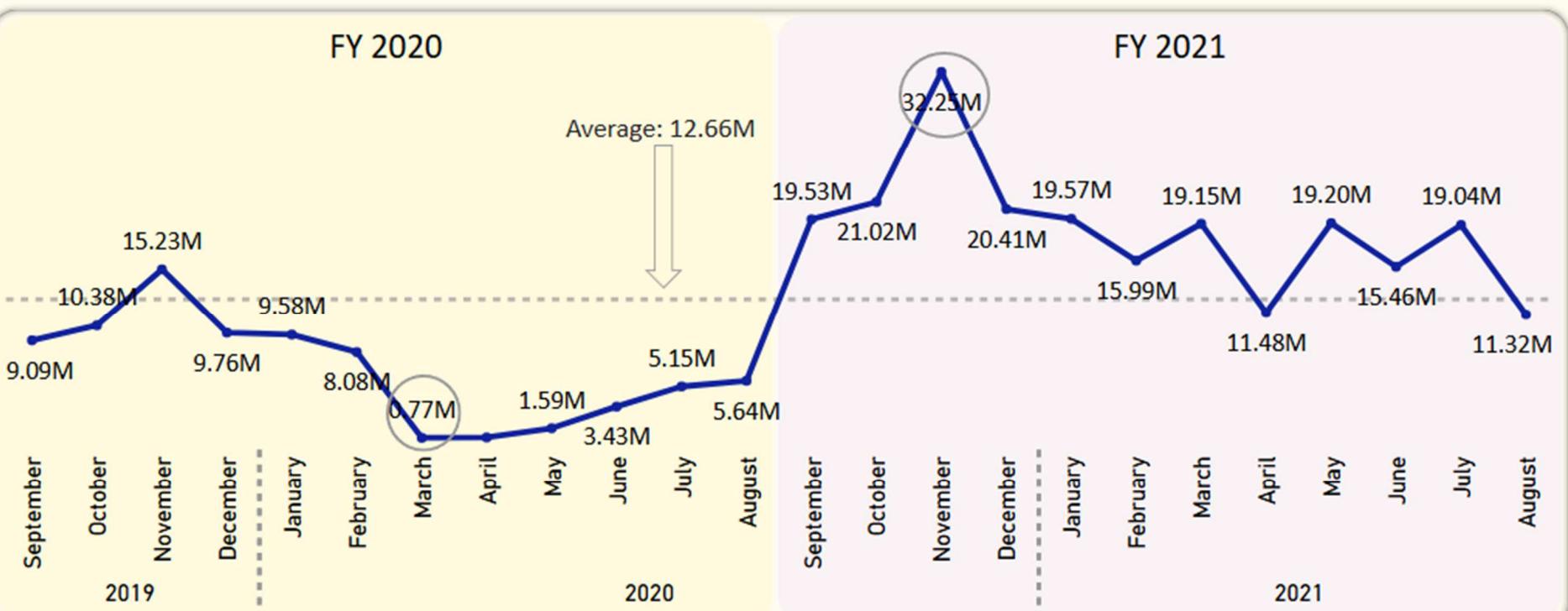


```
SELECT
    MONTHNAME(fsm.date) AS Month,
    fsm.fiscal_year,
    SUM(fsm.sold_quantity * fgp.gross_price) AS gross_sales_amount
FROM
    fact_sales_monthly fsm
JOIN
    fact_gross_price fgp ON fgp.product_code = fsm.product_code
    AND fgp.fiscal_year = fsm.fiscal_year
JOIN
    dim_customer dc ON fsm.customer_code = dc.customer_code
WHERE
    dc.customer = 'Atliq Exclusive'
GROUP BY
    MONTHNAME(fsm.date),
    fsm.fiscal_year,
    MONTH(fsm.date)
ORDER BY
    fsm.fiscal_year,
    MONTH(fsm.date);
```

Insights:

- The **lowest** Gross sales total for both fiscal years is in **March (2020)**.
- The **highest** Gross sales total for both fiscal years is in **November (2020)**.
- **73.8%** of the total Gross sales figure is in **FY 2021**.

	Month	fiscal_year	gross_sales_amount
▶	January	2020	4740600.1605
	February	2020	3996227.7661
	March	2020	378770.9700
	April	2020	395035.3535
	May	2020	783813.4238
	June	2020	1695216.6008
	July	2020	2551159.1584
	August	2020	2786648.2601
	September	2020	4496259.6724
	October	2020	5135902.3467
	November	2020	7522892.5608
	December	2020	4830404.7285
	January	2021	12399392.9788
	February	2021	10129735.5675
	March	2021	12144061.2501
	April	2021	7311999.9547
	May	2021	12150225.0139
	June	2021	9824521.0110
	July	2021	12092346.3245
	August	2021	7178707.5902
	September	2021	12353509.7938
	October	2021	13218636.1966
	November	2021	20464999.0997
	December	2021	12944659.6509



Reasons:

- **COVID-19**
- Global Chip shortage

When did the silicon chip shortage start?

From **early 2020**, when the effects of and the mitigation of the COVID-19 pandemic caused disruptions in supply chains and logistics which, coupled with a 13% increase in global demand for PCs owing to some countries' shift to a stay-at-home economy, impacted the availability of key chips necessary for the manufacturing ...

https://en.wikipedia.org/wiki/2020–present_global_chip_shortage

2020–present global chip shortage - Wikipedia

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



SELECT

```
CASE
    WHEN MONTH(date) BETWEEN 9 AND 11 THEN 'Q1'
    WHEN MONTH(date) IN (12, 1, 2) THEN 'Q2'
    WHEN MONTH(date) BETWEEN 3 AND 5 THEN 'Q3'
    WHEN MONTH(date) BETWEEN 6 AND 8 THEN 'Q4'
END AS fiscal_quarter,
SUM(sold_quantity) AS total_sold_quantity
FROM
    fact_sales_monthly
WHERE
    fiscal_year = 2020
GROUP BY
    fiscal_quarter
ORDER BY
    fiscal_quarter;
```

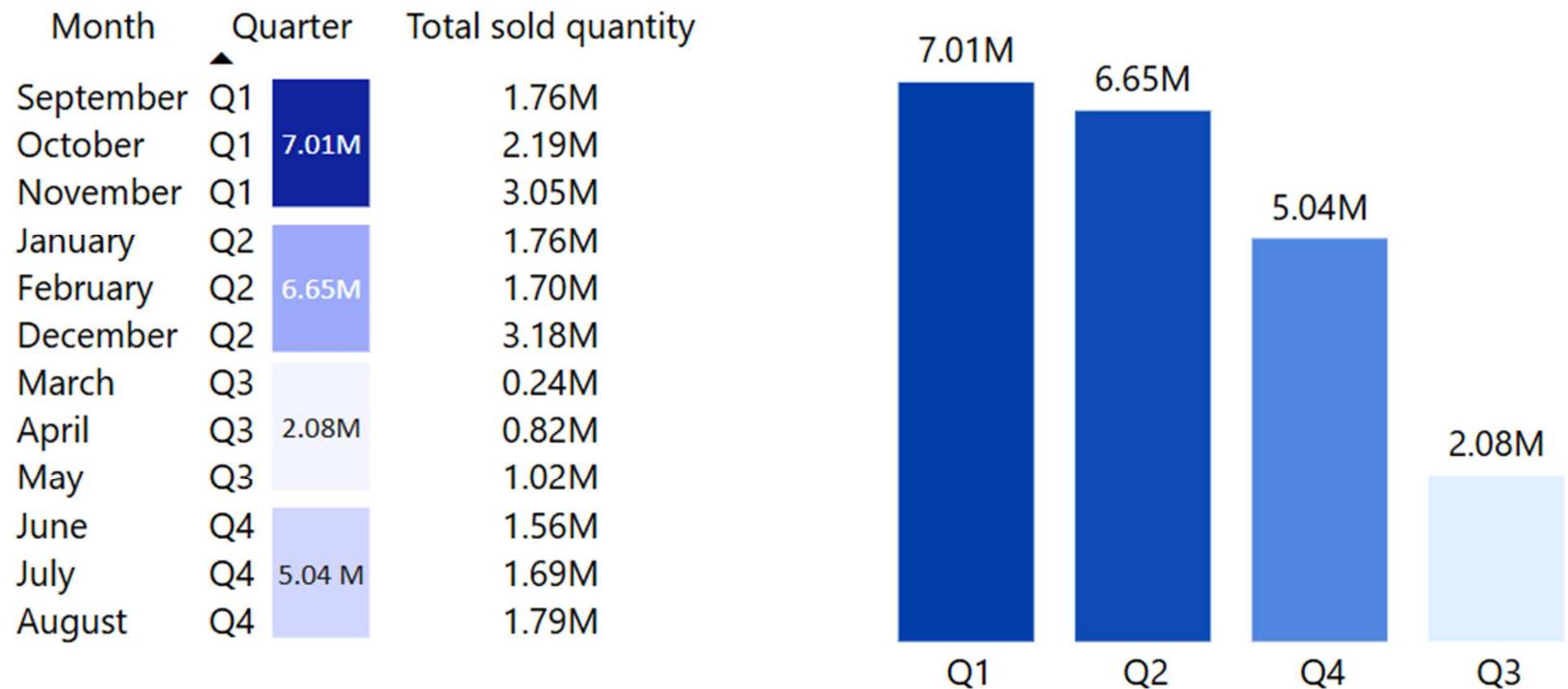
	fiscal_quarter	month_name	month_number	total_sold_quantity
▶	Q1 (Sep-Nov)	September	9	1764002
	Q1 (Sep-Nov)	October	10	2190792
	Q1 (Sep-Nov)	November	11	3050825
	Q2 (Dec-Feb)	December	12	3184205
	Q2 (Dec-Feb)	January	1	1762652
	Q2 (Dec-Feb)	February	2	1702785
	Q3 (Mar-May)	March	3	238961
	Q3 (Mar-May)	April	4	819956
	Q3 (Mar-May)	May	5	1016170
	Q4 (Jun-Aug)	June	6	1559773
	Q4 (Jun-Aug)	July	7	1692575
	Q4 (Jun-Aug)	August	8	1790193

	fiscal_quarter	total_sold_quantity
▶	Q1	7005619
	Q2	6649642
	Q3	2075087
	Q4	5042541

Insights:

- **Quarter 1** of FY2020 saw the most units sold overall, while **Quarter 3** had the fewest.
- The highest and lowest overall sold quantity is in **December** and **March**. Quarter 1 accounts for approximately **34%** of the total sold quantity for FY2020

Total sold quantity in **FY 2020** by **Quarter**

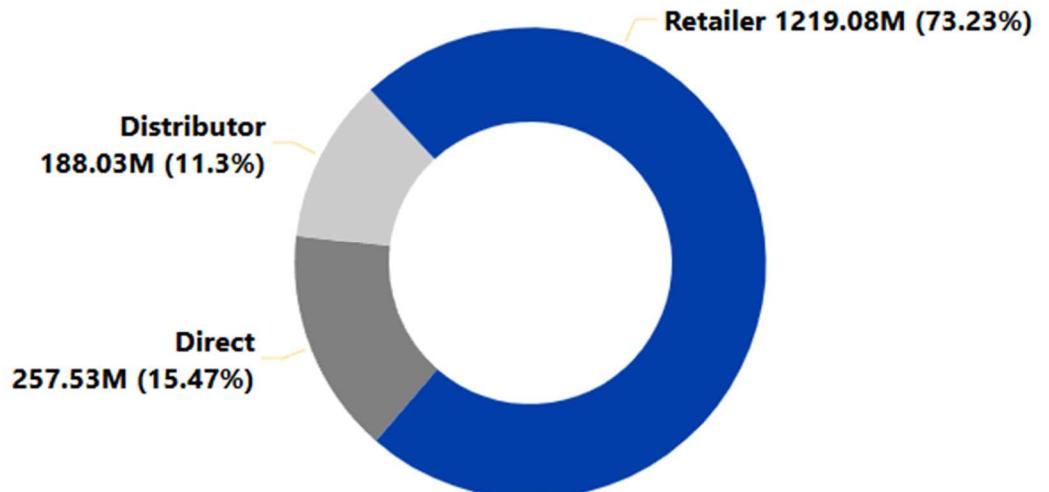


9. Which channel helped to bring more gross sales in the fiscal year 2021 and the percentage of contribution? The final output contains these fields: channel, gross_sales_mln, percentage

```
WITH channel_sales AS (
    SELECT
        dc.channel,
        ROUND(SUM(fsm.sold_quantity * fgp.gross_price) / 1000000, 2) AS gross_sales_mln
    FROM
        dim_customer dc
    JOIN
        fact_sales_monthly fsm
        ON fsm.customer_code = dc.customer_code
        AND fsm.fiscal_year = 2021
    JOIN
        fact_gross_price fgp
        ON fgp.product_code = fsm.product_code
        AND fgp.fiscal_year = fsm.fiscal_year
    GROUP BY
        dc.channel
)
SELECT
    channel,
    gross_sales_mln,
    CONCAT(ROUND(gross_sales_mln * 100 / SUM(gross_sales_mln) OVER (), 1), '%') AS percentage_contribution
FROM
    channel_sales
ORDER BY
    gross_sales_mln DESC;
```

channel	gross_sales_mln	percentage_contribution
Retailer	1219.08	73.2%
Direct	257.53	15.5%
Distributor	188.03	11.3%

Gross sales and contribution percentages
by **Channels** for FY 2021



Insights:

- Channel: "**Retailer**" helped bring maximum sales to the company with **73.22%** as the contribution percentage.
- Channel: "**Distributor**" makes the least contribution at a percentage of **11.31%**.

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 product total_sold_quantity rank_order

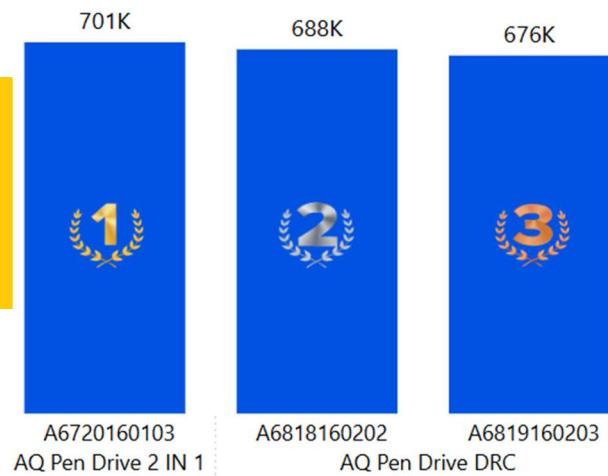
```
WITH product_sales AS (
    SELECT
        dp.division,
        dp.product_code,
        dp.product,
        SUM(fsm.sold_quantity) AS total_sold_quantity,
        RANK() OVER (PARTITION BY dp.division ORDER BY SUM(fsm.sold_quantity) DESC) AS rank_order
    FROM
        dim_product dp
    JOIN
        fact_sales_monthly fsm ON dp.product_code = fsm.product_code
    WHERE
        fsm.fiscal_year = 2021
    GROUP BY
        dp.division, dp.product_code, dp.product
)
SELECT
    division,
    product_code,
    product,
    total_sold_quantity,
    rank_order
FROM
    product_sales
WHERE
    rank_order <= 3
ORDER BY
    division,
    rank_order;
```

	division	product_code	product	total_sold_quantity	rank_order
▶	N & S	A6720160103	AQ Pen Drive 2 IN 1	701373	1
	N & S	A6818160202	AQ Pen Drive DRC	688003	2
	N & S	A6819160203	AQ Pen Drive DRC	676245	3
	P & A	A2319150302	AQ Gamers Ms	428498	1
	P & A	A2520150501	AQ Maxima Ms	419865	2
	P & A	A2520150504	AQ Maxima Ms	419471	3
	PC	A4218110202	AQ Digit	17434	1
	PC	A4319110306	AQ Velocity	17280	2
	PC	A4218110208	AQ Digit	17275	3

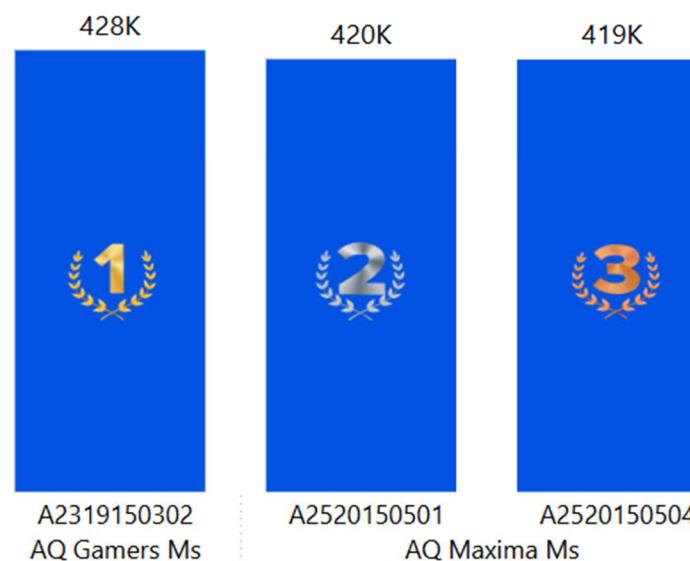
Insight:

- Every division has a product with **different variants** that appears **twice** in the top three products by division list.

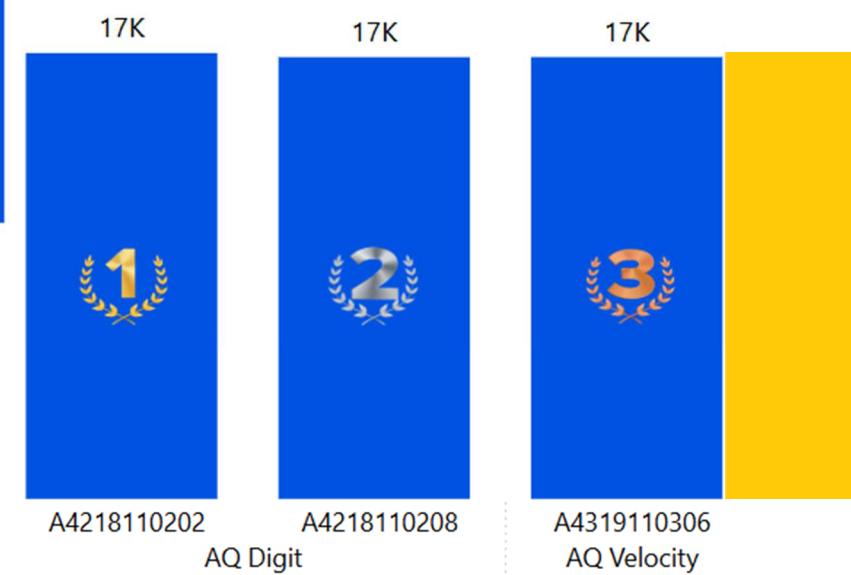
Division ● N & S



Division ● P & A



Division ● PC





Thank you