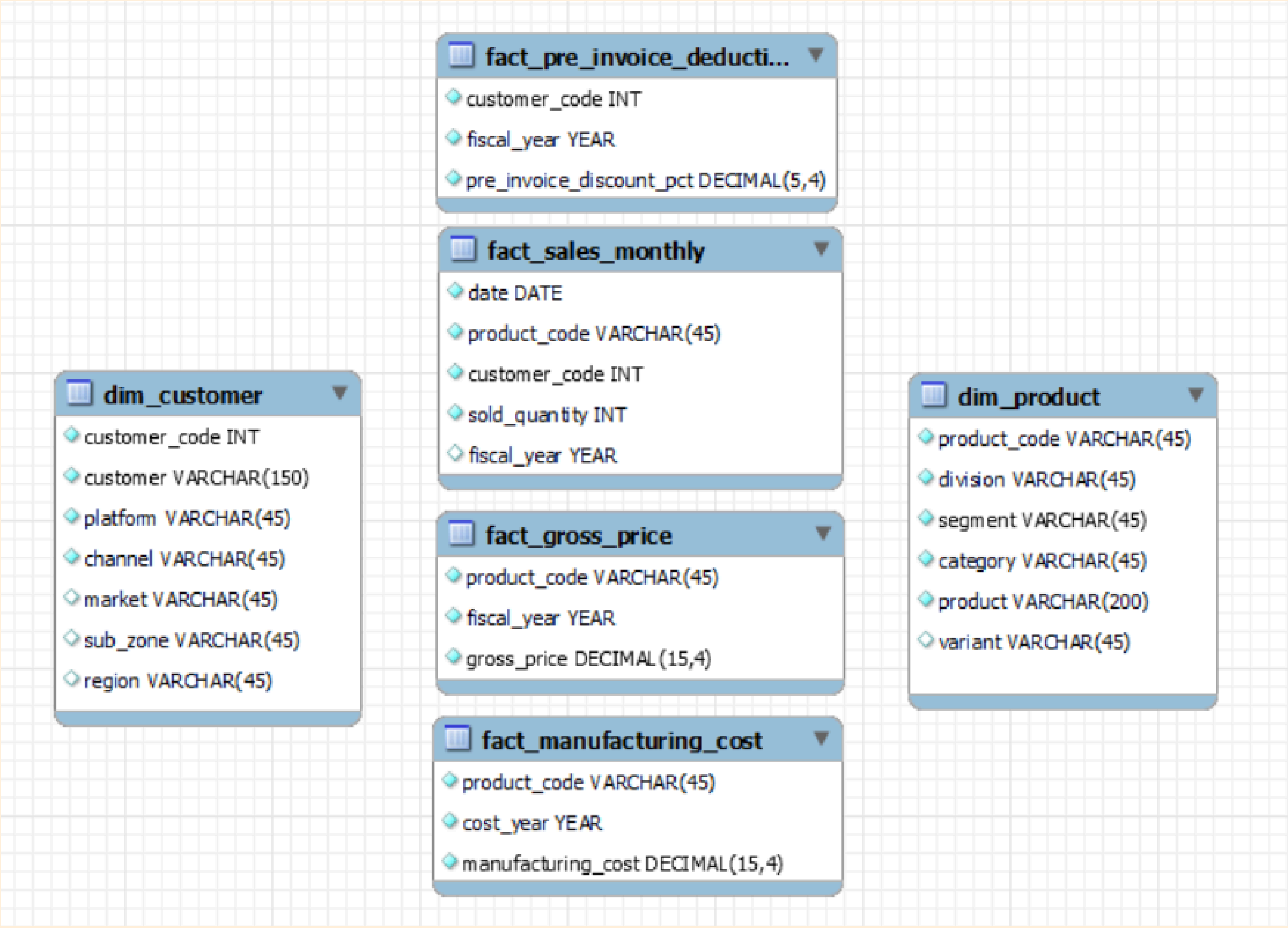
CONSUMER GOODS AD-HOC INSIGHTS

CREATED BY: PARTH S

OBJECTIVES

- AtliQHardware, a fictitious corporation, distinguishes itself as a prominent computer hardware manufacturer in India with a strong global presence.
- Despite its prominence, the management acknowledges the necessity for more timely and well-informed decisions supported by data insights.
- A strategic initiative is underway to strengthen the data analytics team through the recruitment of junior data analysts.
- To thoroughly assess potential candidates, Tony Sharma, the Director of Data Analytics, intends to orchestrate an SQL challenge, gauging both technical skills and soft skills.
- The company has identified 10 specific ad hoc requests for which they are seeking valuable insights.

INPUT DATA AND TOOLS USED



fact_pre_invoice_deducti...

- customer_code INT
- fiscal_year YEAR
- pre_invoice_discount_pct DECIMAL(5,4)

fact_sales_monthly

- date DATE
- product_code VARCHAR(45)
- customer_code INT
- sold_quantity INT
- fiscal_year YEAR

dim_customer

- customer_code INT
- customer VARCHAR(150)
- platform VARCHAR(45)
- channel VARCHAR(45)
- market VARCHAR(45)
- sub_zone VARCHAR(45)
- region VARCHAR(45)

fact_gross_price

- product_code VARCHAR(45)
- fiscal_year YEAR
- gross_price DECIMAL(15,4)

dim_product

- product_code VARCHAR(45)
- division VARCHAR(45)
- segment VARCHAR(45)
- category VARCHAR(45)
- product VARCHAR(200)
- variant VARCHAR(45)

fact_manufacturing_cost

- product_code VARCHAR(45)
- cost_year YEAR
- manufacturing_cost DECIMAL(15,4)

MySQL

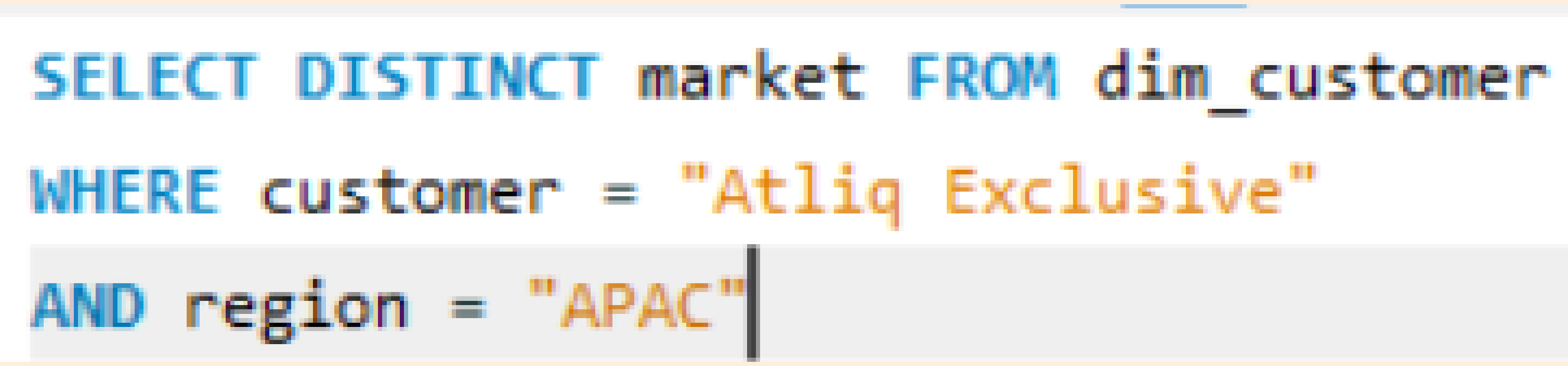
pandas

matplotlib

AD-HOC REQUEST 1

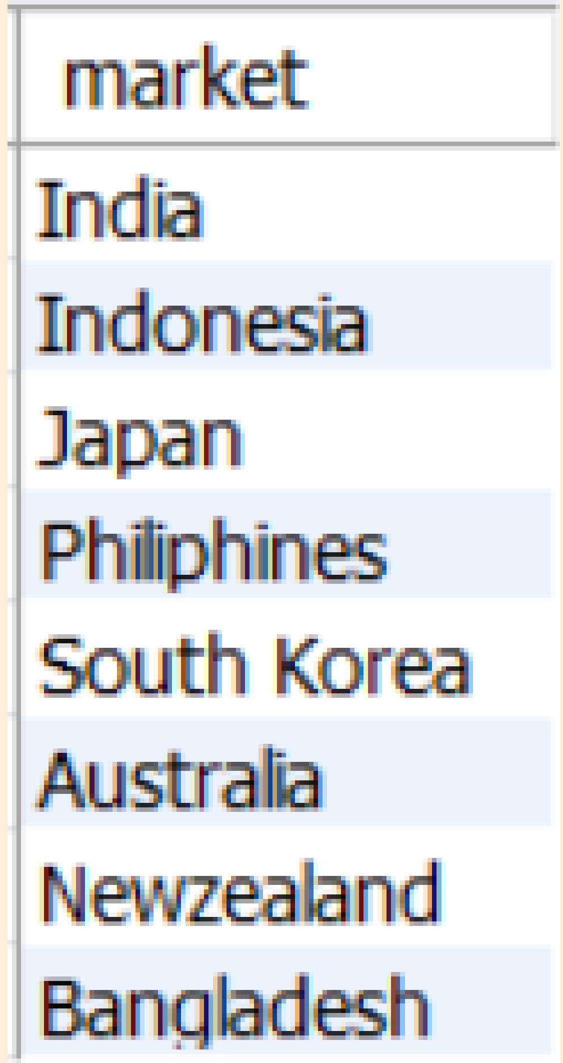
- Provide the list of markets in which customer "AtliQExclusive" operates its business in the “APAC” region

SQL QUERY



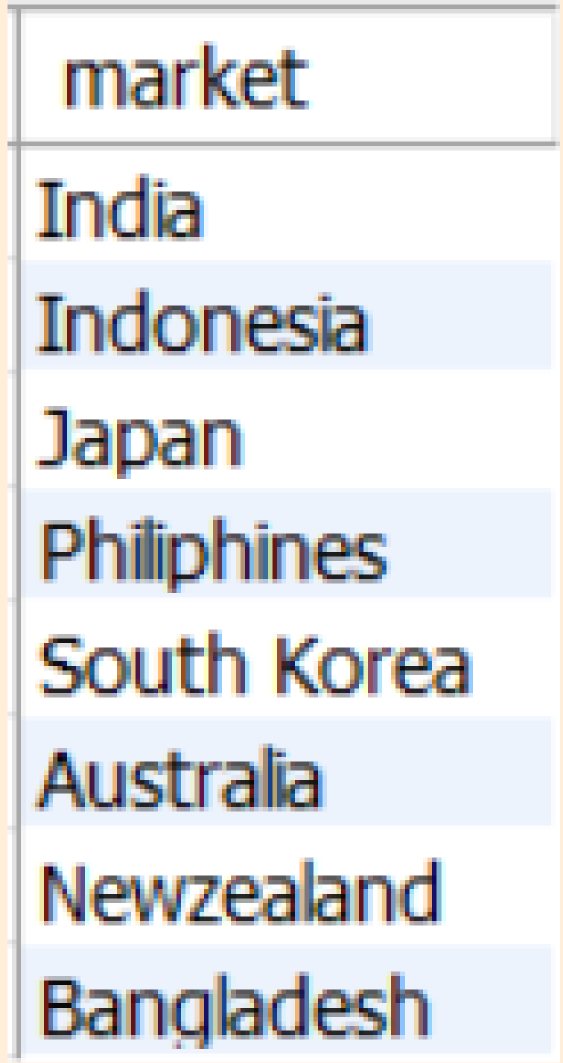
```
SELECT DISTINCT market FROM dim_customer
WHERE customer = "Atliq Exclusive"
AND region = "APAC"
```

OUTPUT

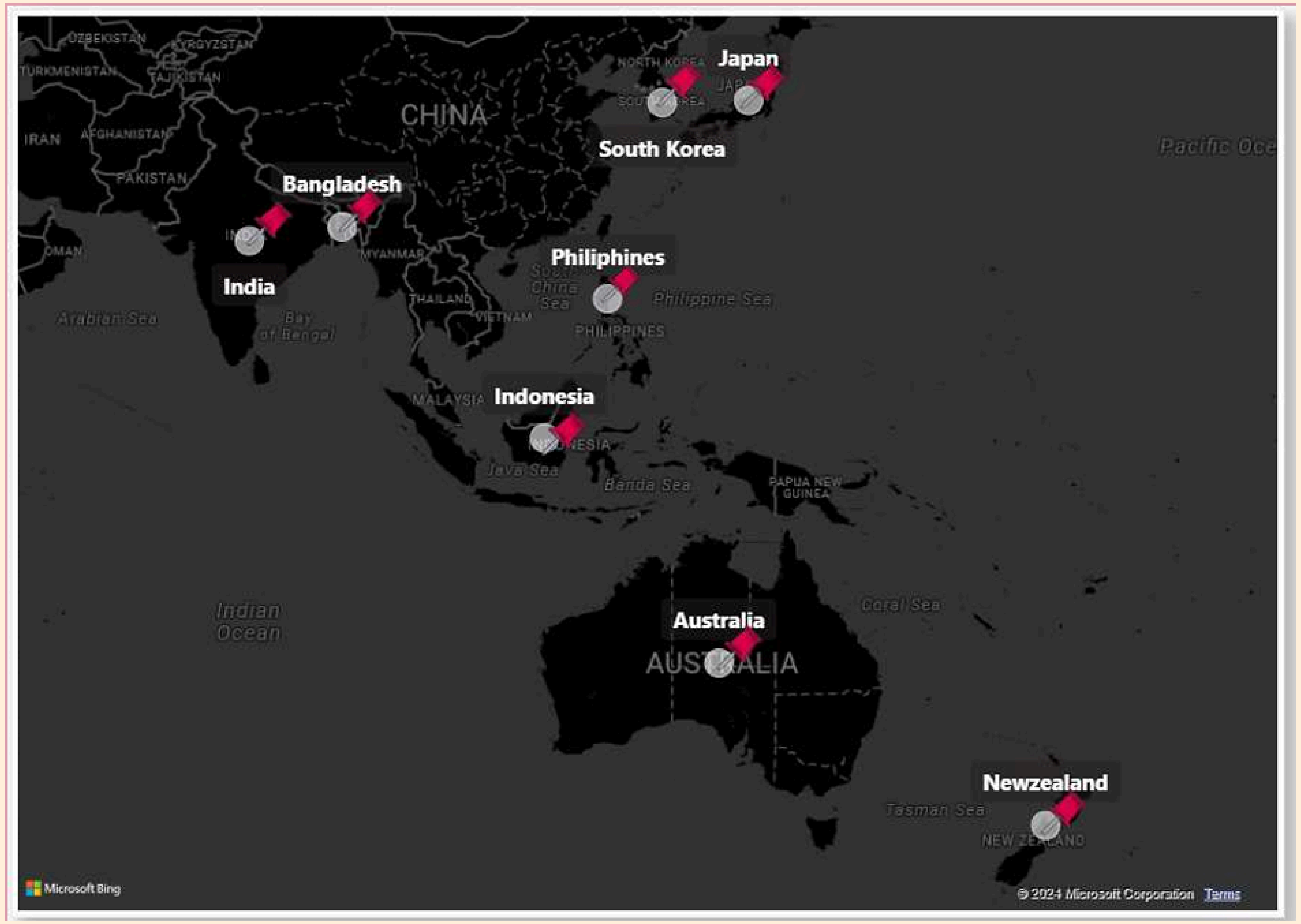


market
India
Indonesia
Japan
Philiphines
South Korea
Australia
Newzealand
Bangladesh

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



market
India
Indonesia
Japan
Philiphines
South Korea
Australia
Newzealand
Bangladesh

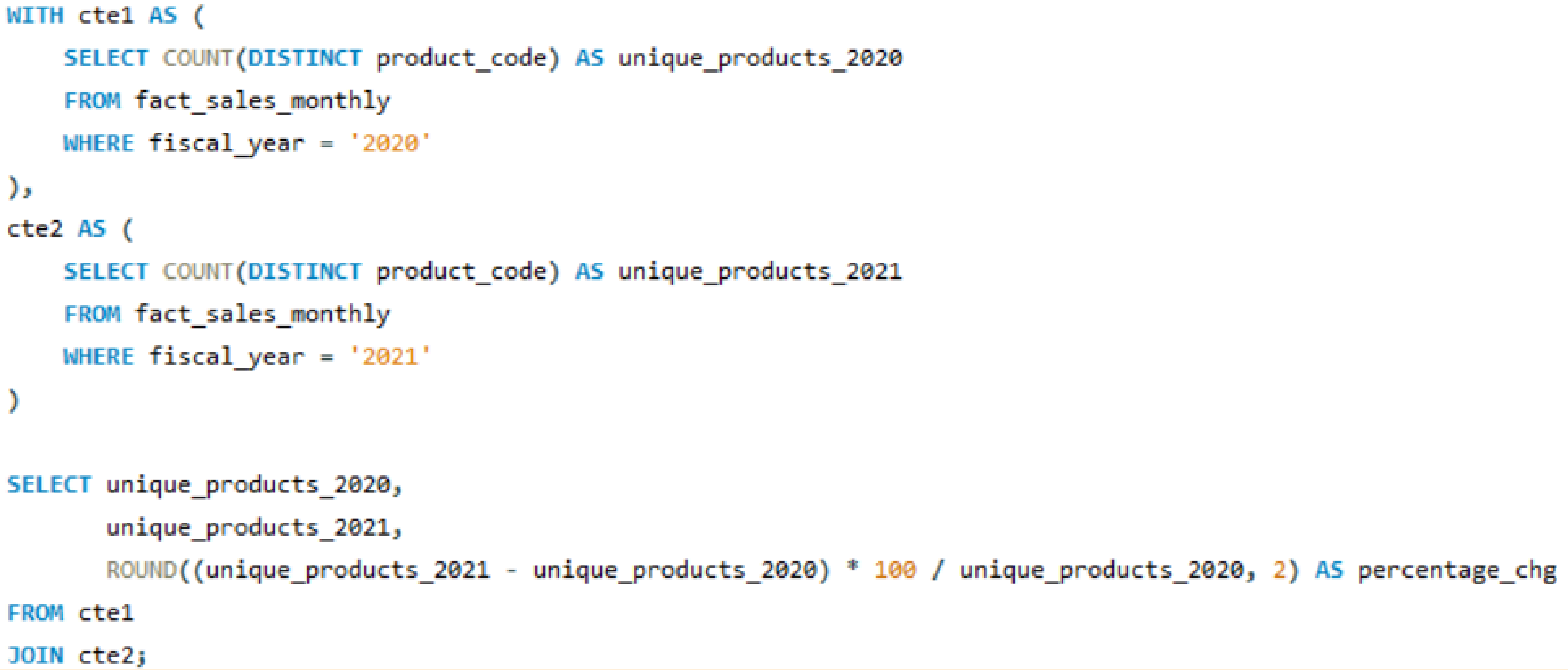


AD-HOC REQUEST 2

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

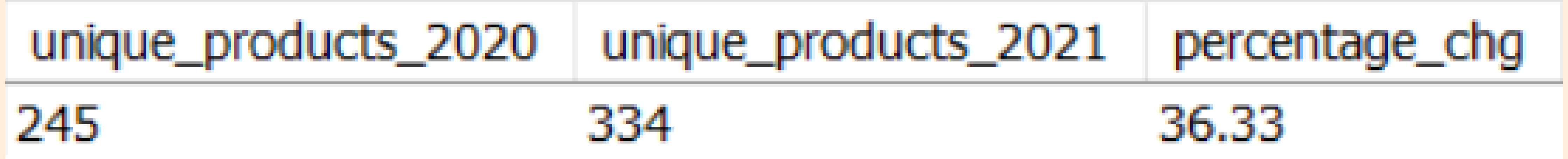
unique_products_2020, unique_products_2021, percentage_chg

SQL QUERY



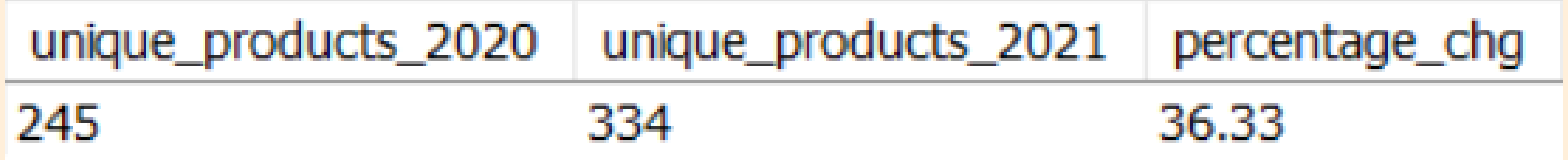
```
WITH cte1 AS (
    SELECT COUNT(DISTINCT product_code) AS unique_products_2020
    FROM fact_sales_monthly
    WHERE fiscal_year = '2020'
),
cte2 AS (
    SELECT COUNT(DISTINCT product_code) AS unique_products_2021
    FROM fact_sales_monthly
    WHERE fiscal_year = '2021'
)

SELECT unique_products_2020,
       unique_products_2021,
       ROUND((unique_products_2021 - unique_products_2020) * 100 / unique_products_2020, 2) AS percentage_chg
FROM cte1
JOIN cte2;
```

OUTPUT



unique_products_2020	unique_products_2021	percentage_chg
245	334	36.33

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



unique_products_2020	unique_products_2021	percentage_chg
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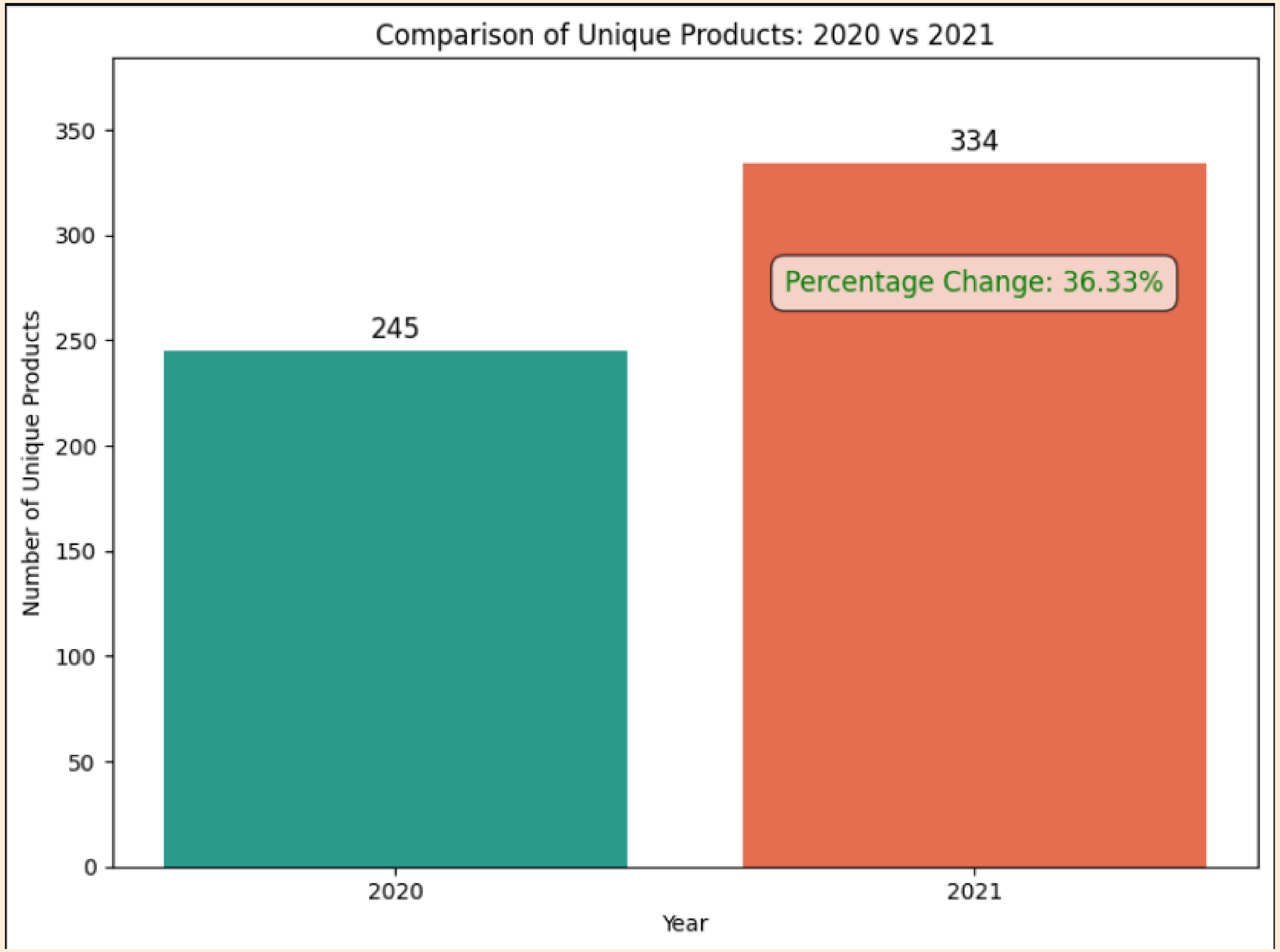
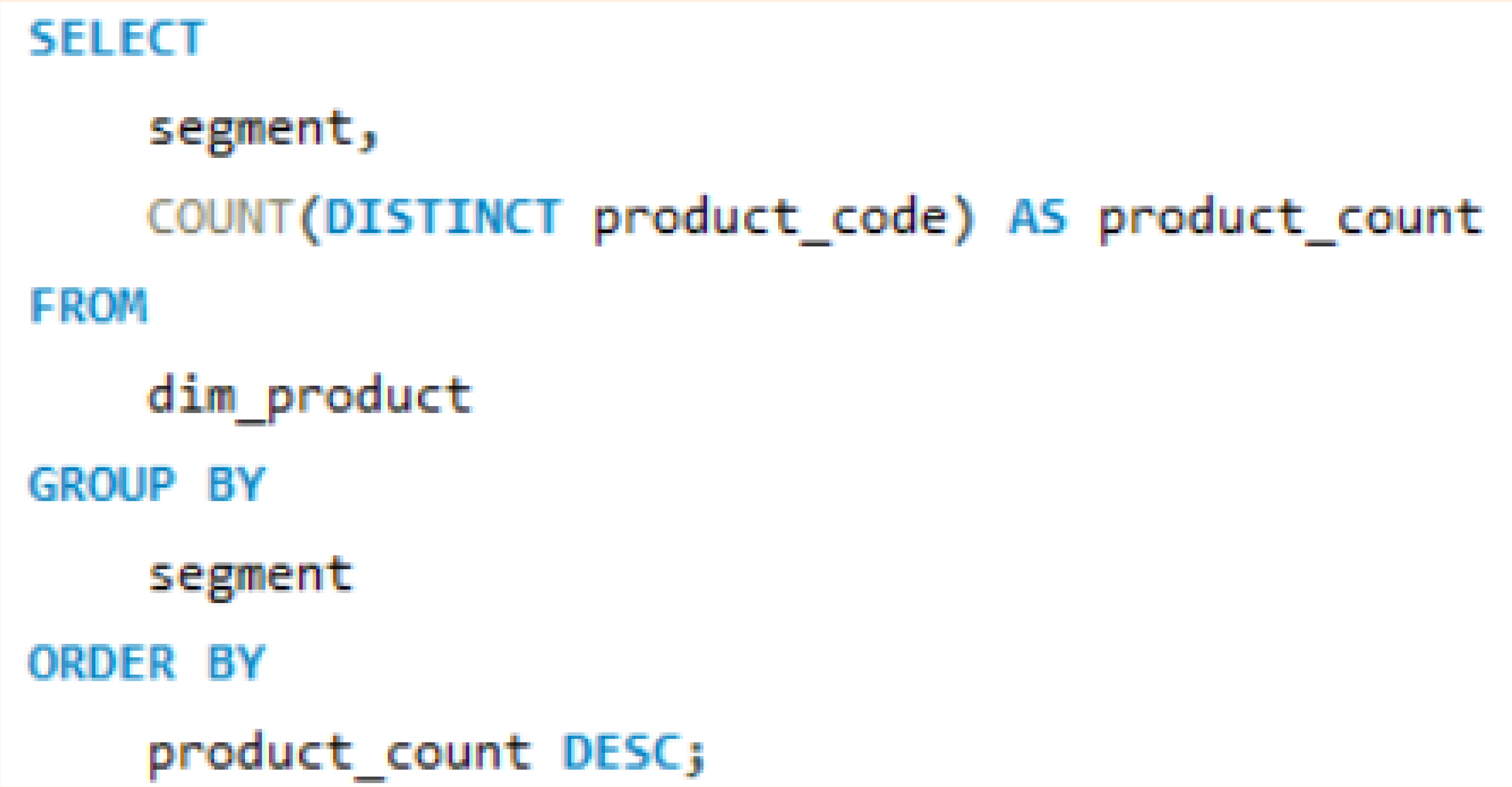


Positively demonstrating ongoing innovation, introducing new products consistently.
In FY 2020, we had245 products,
but in FY 2021, the count surged by 36%
to reach 334products.

AD-HOC REQUEST 3

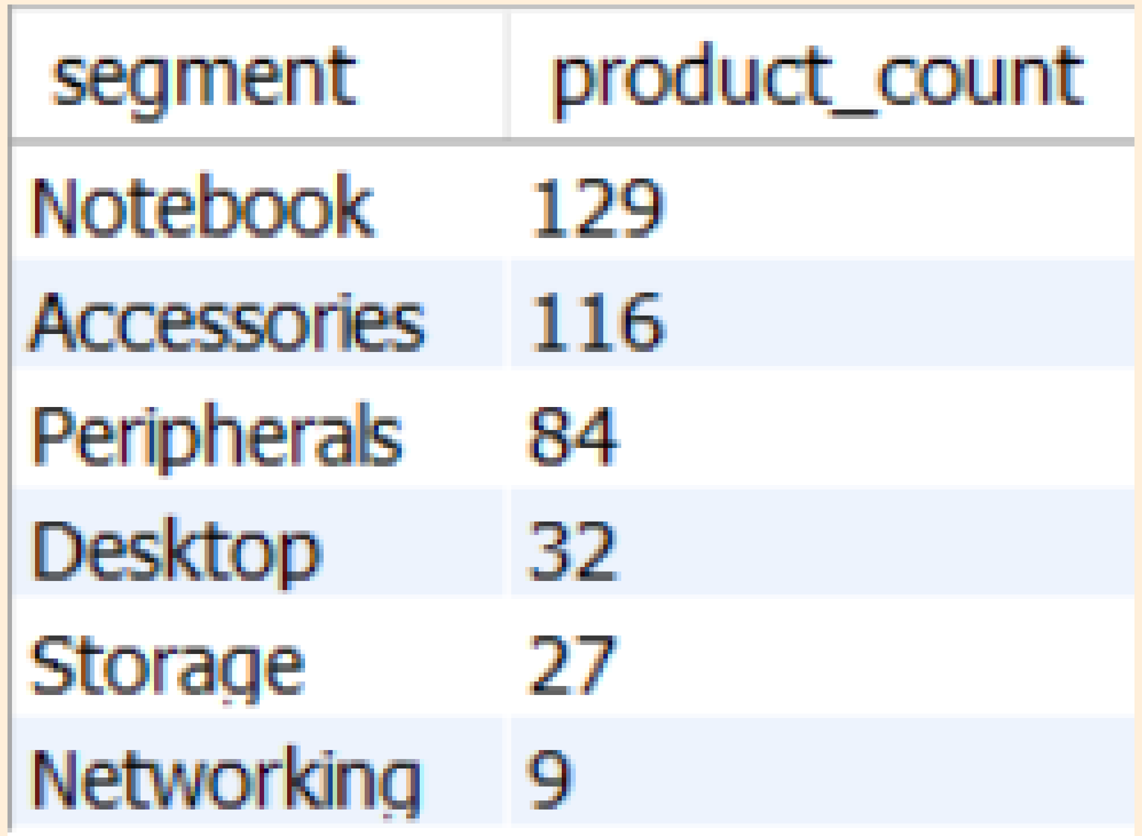
- Provide a report with all the unique product counts for each segment and sort them in descending order of product counts. The final output contains 2 fields, segment, product_count

SQL QUERY



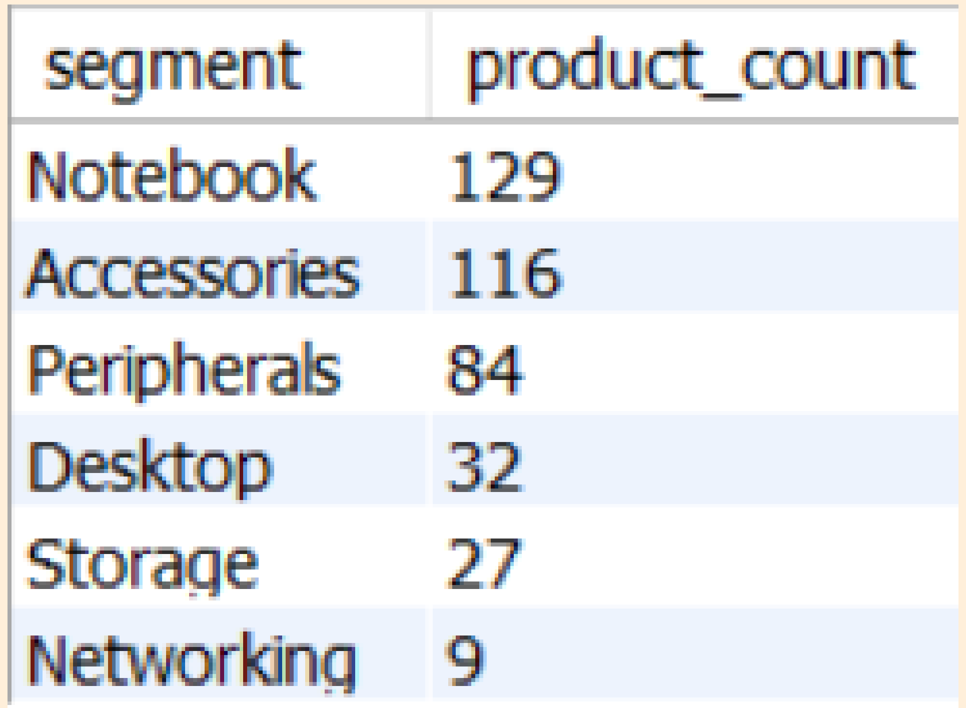
```
SELECT
    segment,
    COUNT(DISTINCT product_code) AS product_count
FROM
    dim_product
GROUP BY
    segment
ORDER BY
    product_count DESC;
```

OUTPUT



segment	product_count
Notebook	129
Accessories	116
Peripherals	84
Desktop	32
Storage	27
Networking	9

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



segment	product_count
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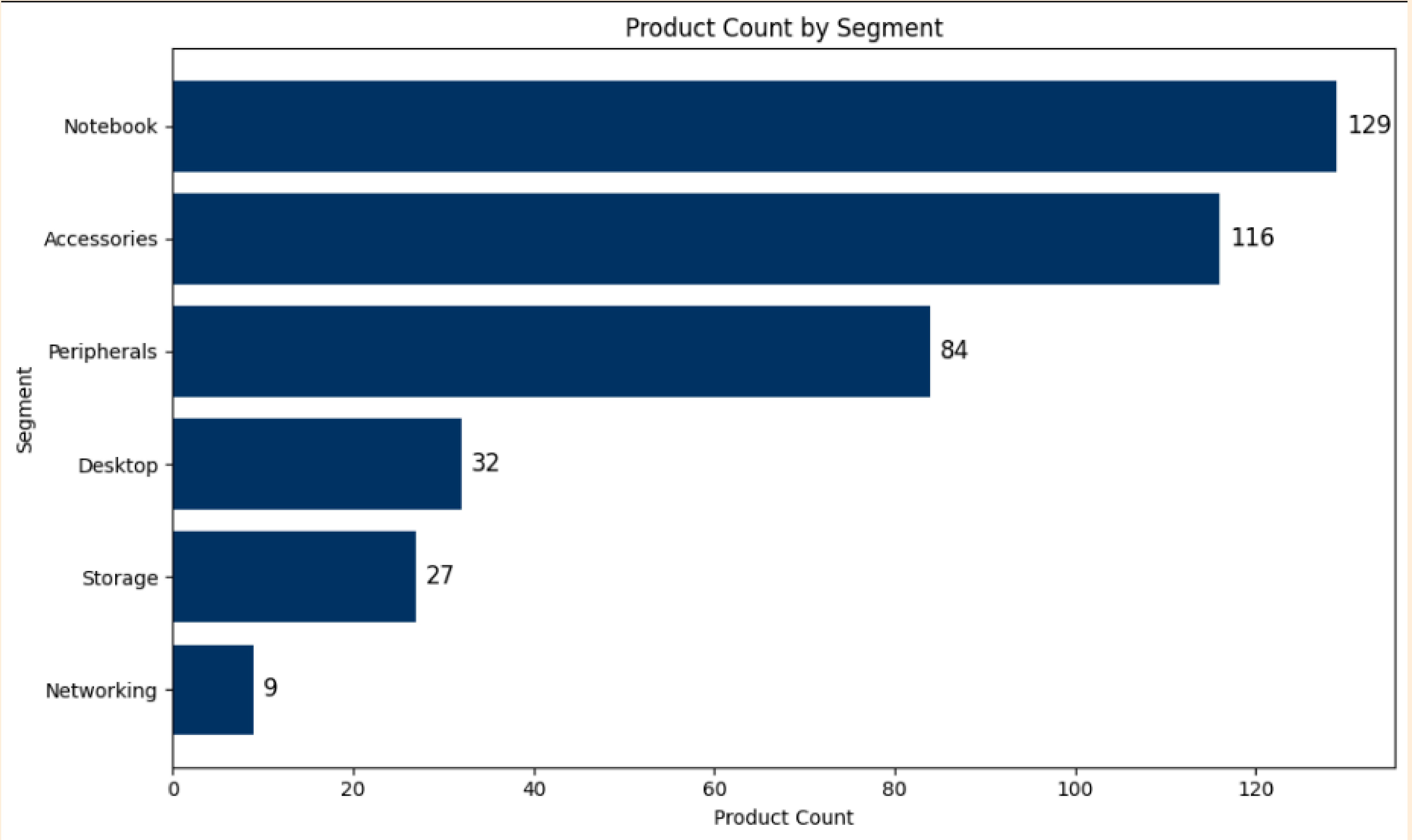


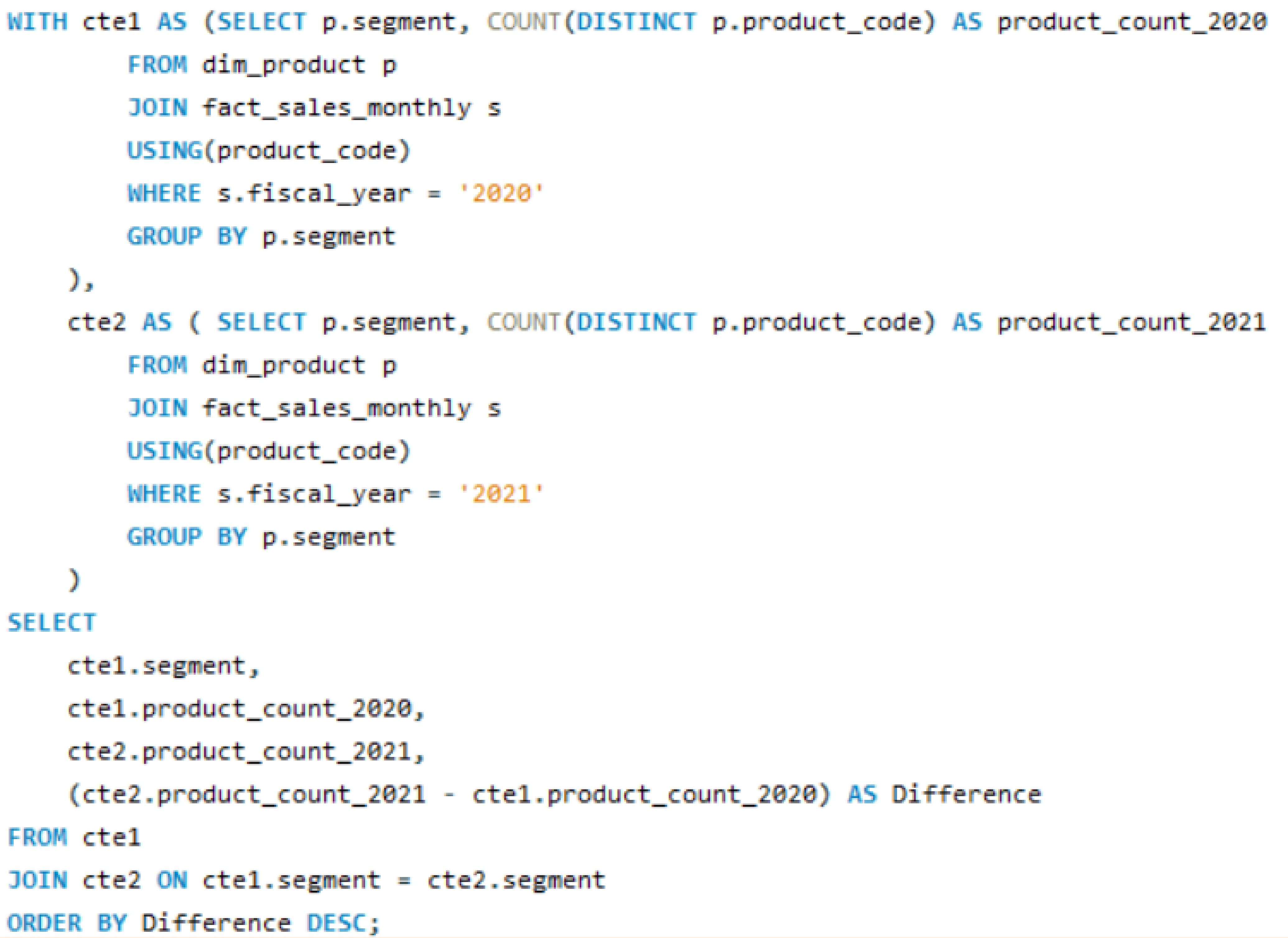
Product Count by Segment

- Segments such as notebooks, accessories, and peripherals are experiencing notable manufacturing expansion when contrasted with desktops, storage, and networking.
- Notebooks, accessories, and peripherals make up 83% of the total manufactured products

AD-HOC REQUEST 4

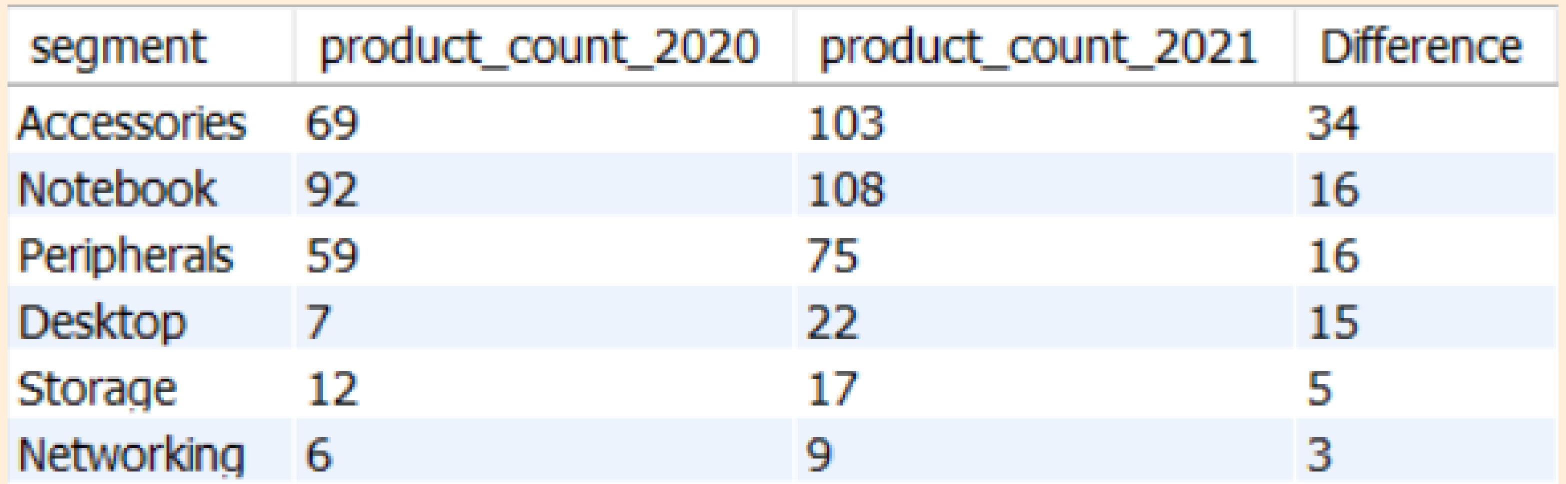
- Follow-up: Which segment had the most increase in unique products in 2021 vs 2020? The final output contains these fields,
  segment, product_count_2020, product_count_2021, difference

SQL QUERY



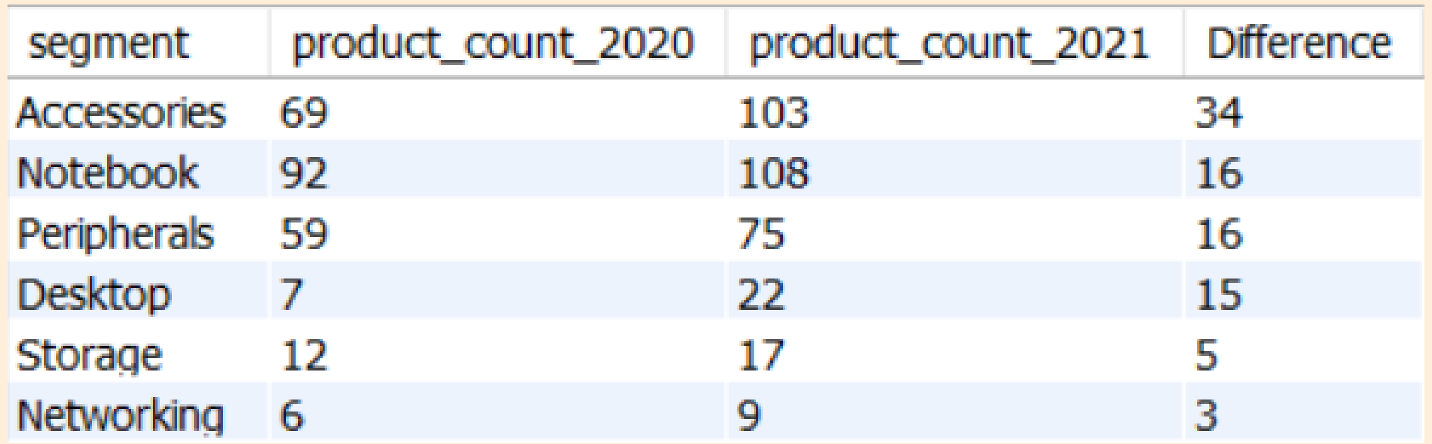
```
WITH cte1 AS (SELECT p.segment, COUNT(DISTINCT p.product_code) AS product_count_2020
        FROM dim_product p
        JOIN fact_sales_monthly s
        USING(product_code)
        WHERE s.fiscal_year = '2020'
        GROUP BY p.segment
    ),
    cte2 AS ( SELECT p.segment, COUNT(DISTINCT p.product_code) AS product_count_2021
        FROM dim_product p
        JOIN fact_sales_monthly s
        USING(product_code)
        WHERE s.fiscal_year = '2021'
        GROUP BY p.segment
    )
SELECT
    cte1.segment,
    cte1.product_count_2020,
    cte2.product_count_2021,
    (cte2.product_count_2021 - cte1.product_count_2020) AS Difference
FROM cte1
JOIN cte2 ON cte1.segment = cte2.segment
ORDER BY Difference DESC;
```

OUTPUT



segment	product_count_2020	product_count_2021	Difference
Accessories	69	103	34
Notebook	92	108	16
Peripherals	59	75	16
Desktop	7	22	15
Storage	12	17	5
Networking	6	9	3

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



segment	product_count_2020	product_count_2021	Difference
Accessories	69	103	34
Notebook	92	108	16
Peripherals	59	75	16
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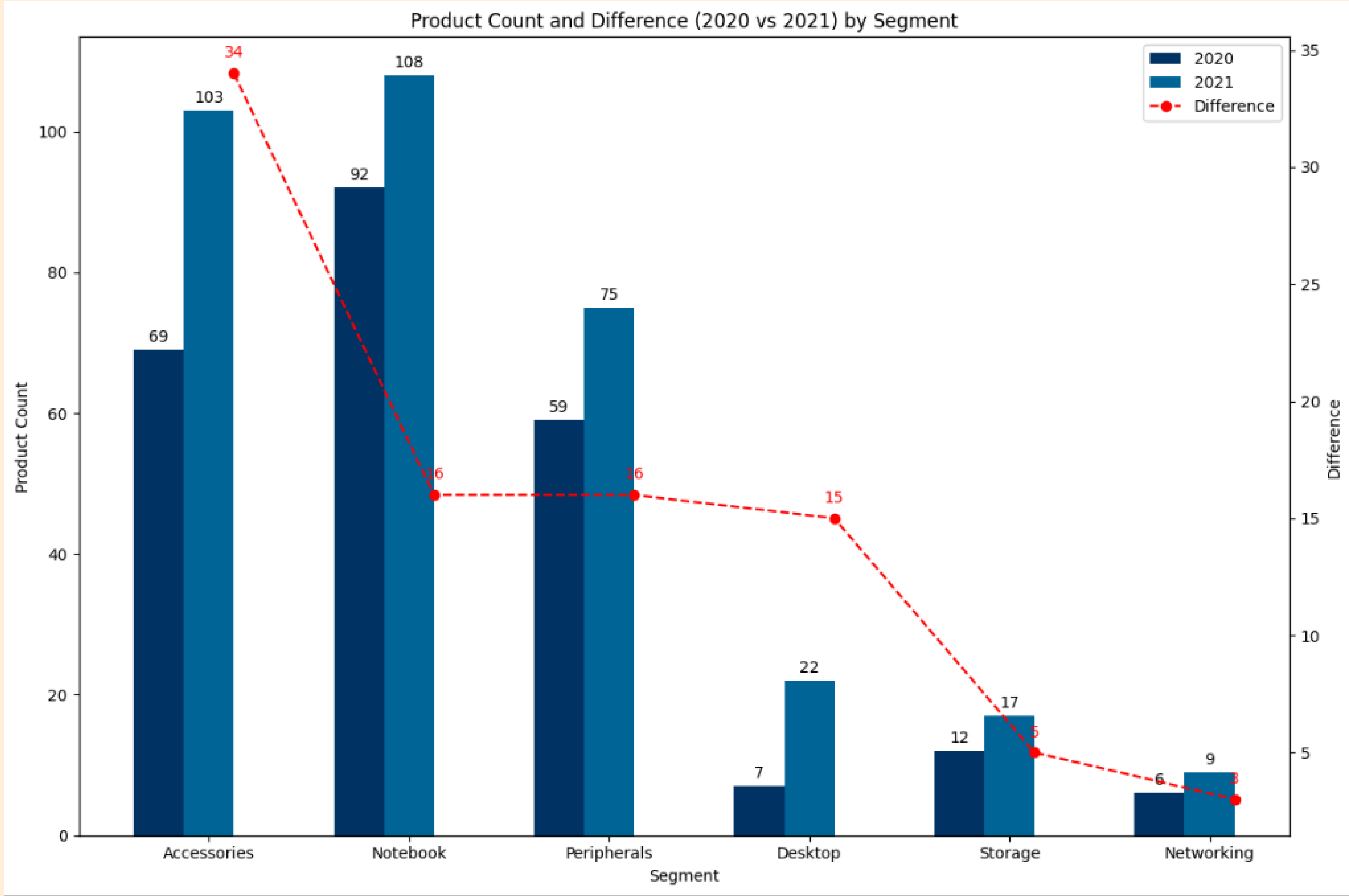
Networking	6	9	3

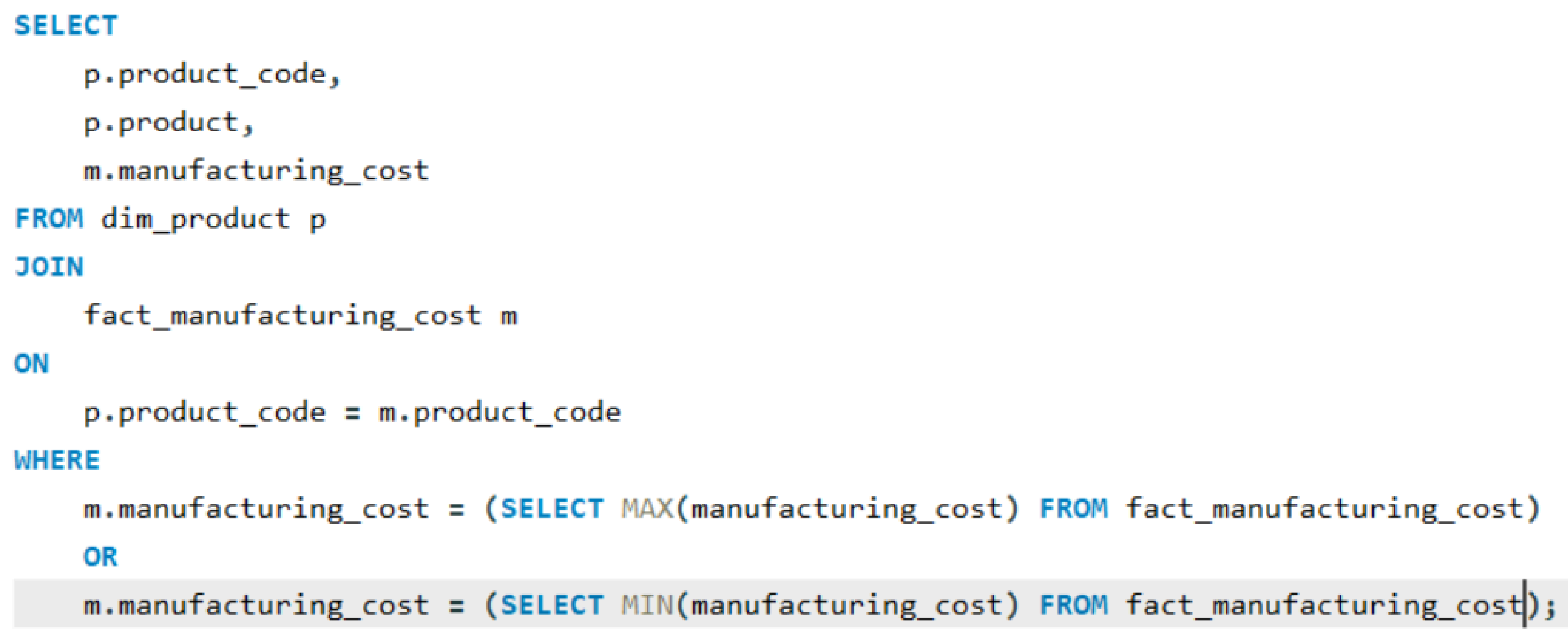


- Accessories saw the most significant rise in production.
- Storage and networking are undergoing slower growth compared to other segments

AD-HOC REQUEST 5

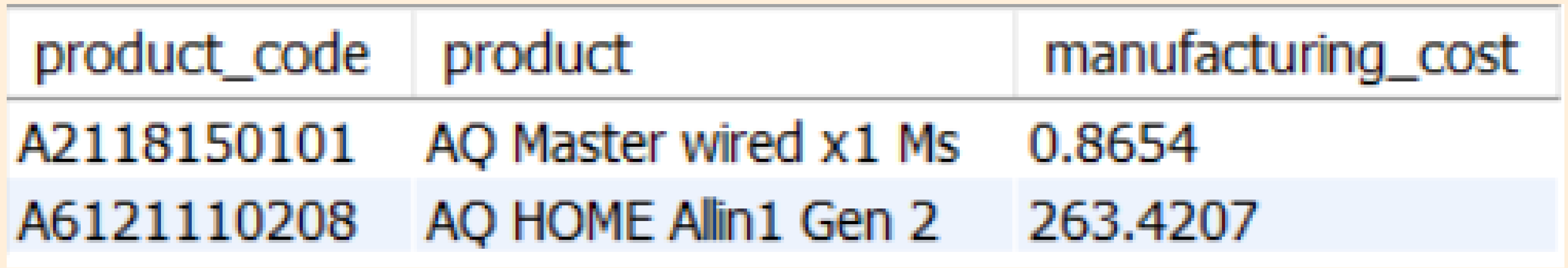
- Get the products that have the highest and lowest manufacturing costs. The final output should contain these fields,
  product_code, product manufacturing_cost

SQL QUERY



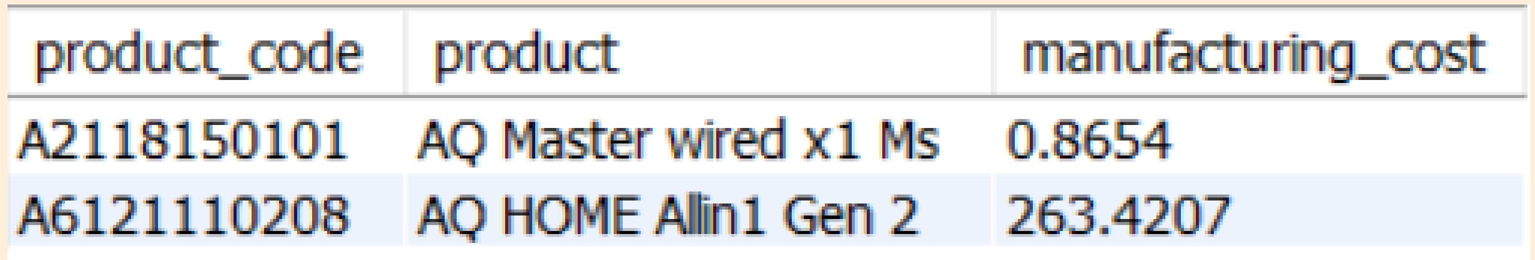
```
SELECT
    p.product_code,
    p.product,
    m.manufacturing_cost
FROM dim_product p
JOIN
    fact_manufacturing_cost m
ON
    p.product_code = m.product_code
WHERE
    m.manufacturing_cost = (SELECT MAX(manufacturing_cost) FROM fact_manufacturing_cost)
    OR
    m.manufacturing_cost = (SELECT MIN(manufacturing_cost) FROM fact_manufacturing_cost);
```

OUTPUT

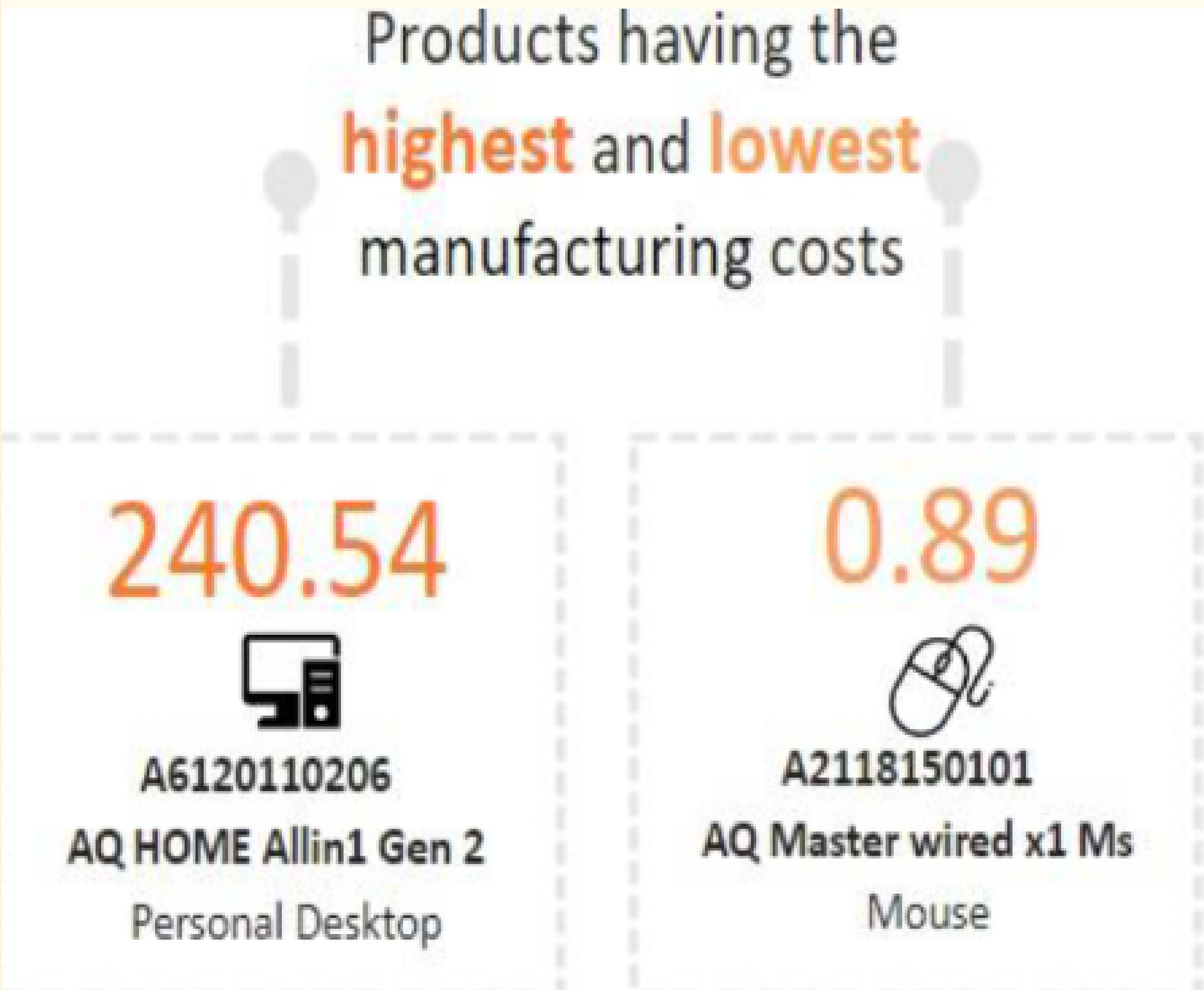


product_code	product	manufacturing_cost
A2118150101	AQ Master wired x1 Ms	0.8654
A6121110208	AQ HOME Allin1 Gen 2	263.4207

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



product_code	product	manufacturing_cost
A2118150101	AQ Master wired x1 Ms	0.8654
A6121110208	AQ HOME Allin1 Gen 2	263.4207



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

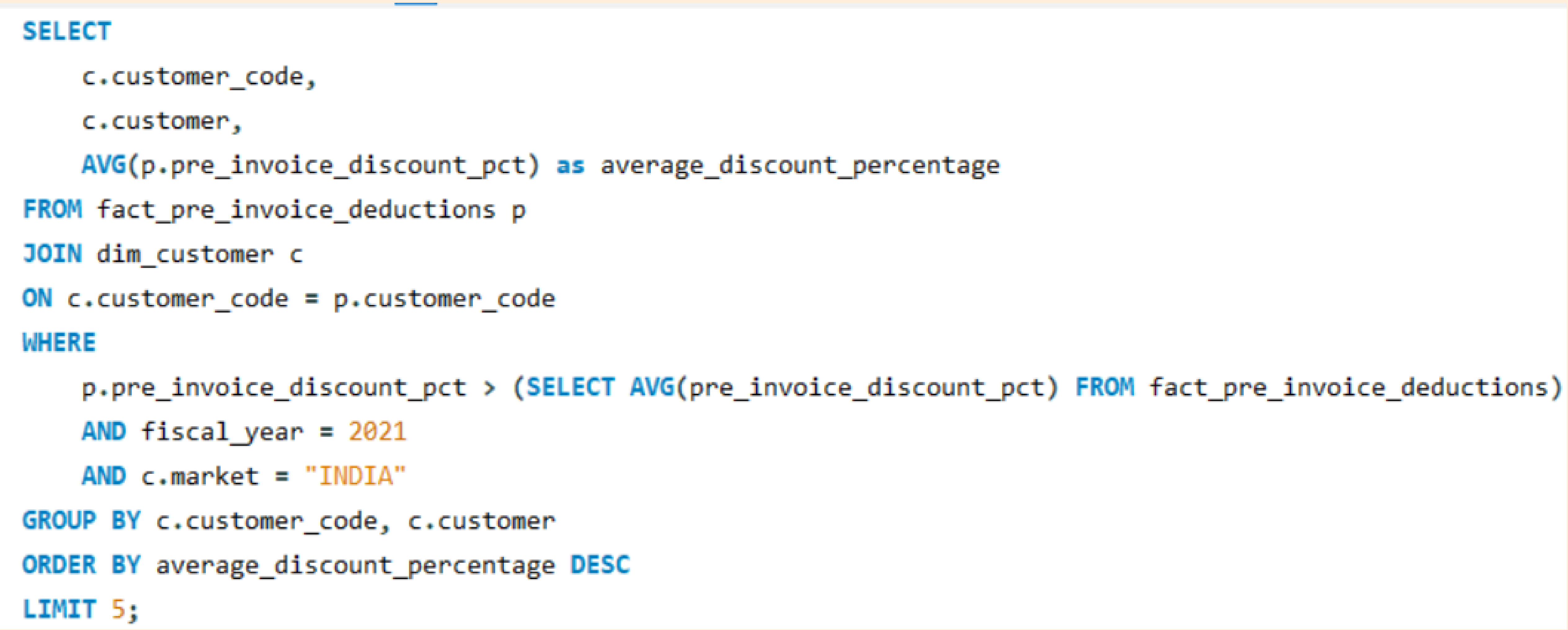
Mouse

- The AQ Home All in 1 Gen2 (Variant: Plus3) Personal desktop has the highest manufacturing cost.
- The AQ Master wired x 1Ms (Variant: Standard1) Mouse incurs the lowest manufacturing cost.

AD-HOC REQUEST 6

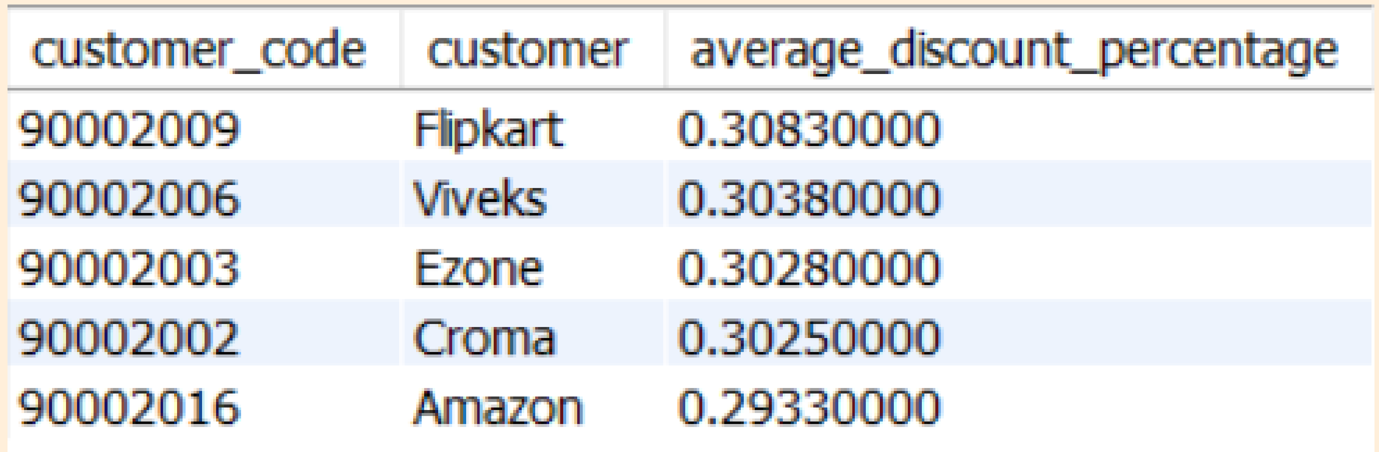
- Generate a report which contains the top 5 customers who received an average high pre_invoice_discount_pct for the fiscal year 2021 and in the Indian market. The final output contains these fields,
  customer_code, customer, average_discount_percentage

SQL QUERY



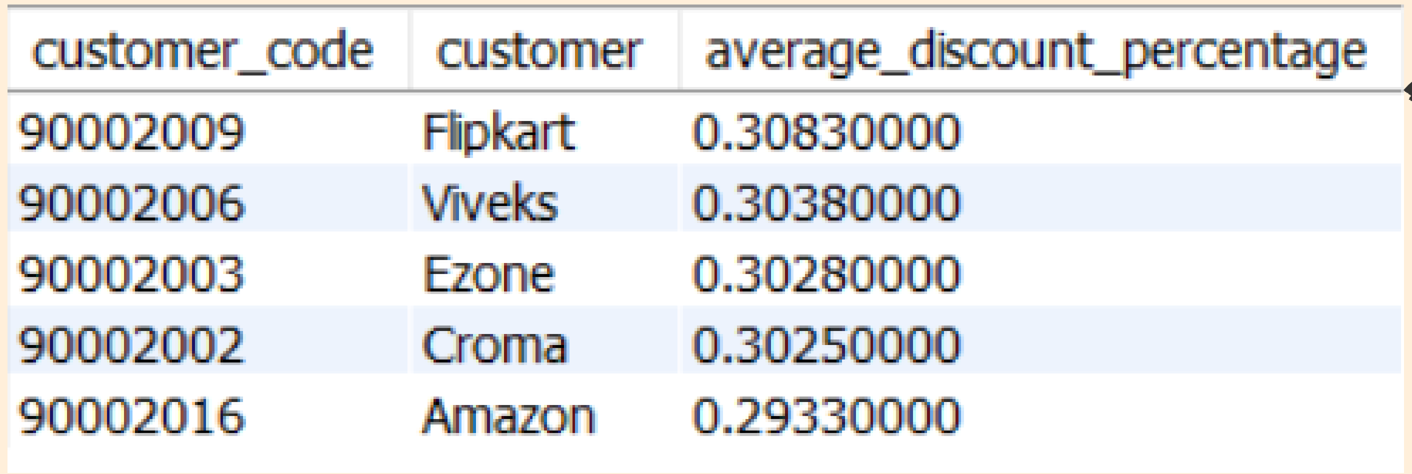
```
SELECT
    c.customer_code,
    c.customer,
    AVG(p.pre_invoice_discount_pct) as average_discount_percentage
FROM fact_pre_invoice_deductions p
JOIN dim_customer c
ON c.customer_code = p.customer_code
WHERE
    p.pre_invoice_discount_pct > (SELECT AVG(pre_invoice_discount_pct) FROM fact_pre_invoice_deductions)
    AND fiscal_year = 2021
    AND c.market = "INDIA"
GROUP BY c.customer_code, c.customer
ORDER BY average_discount_percentage DESC
LIMIT 5;
```

OUTPUT

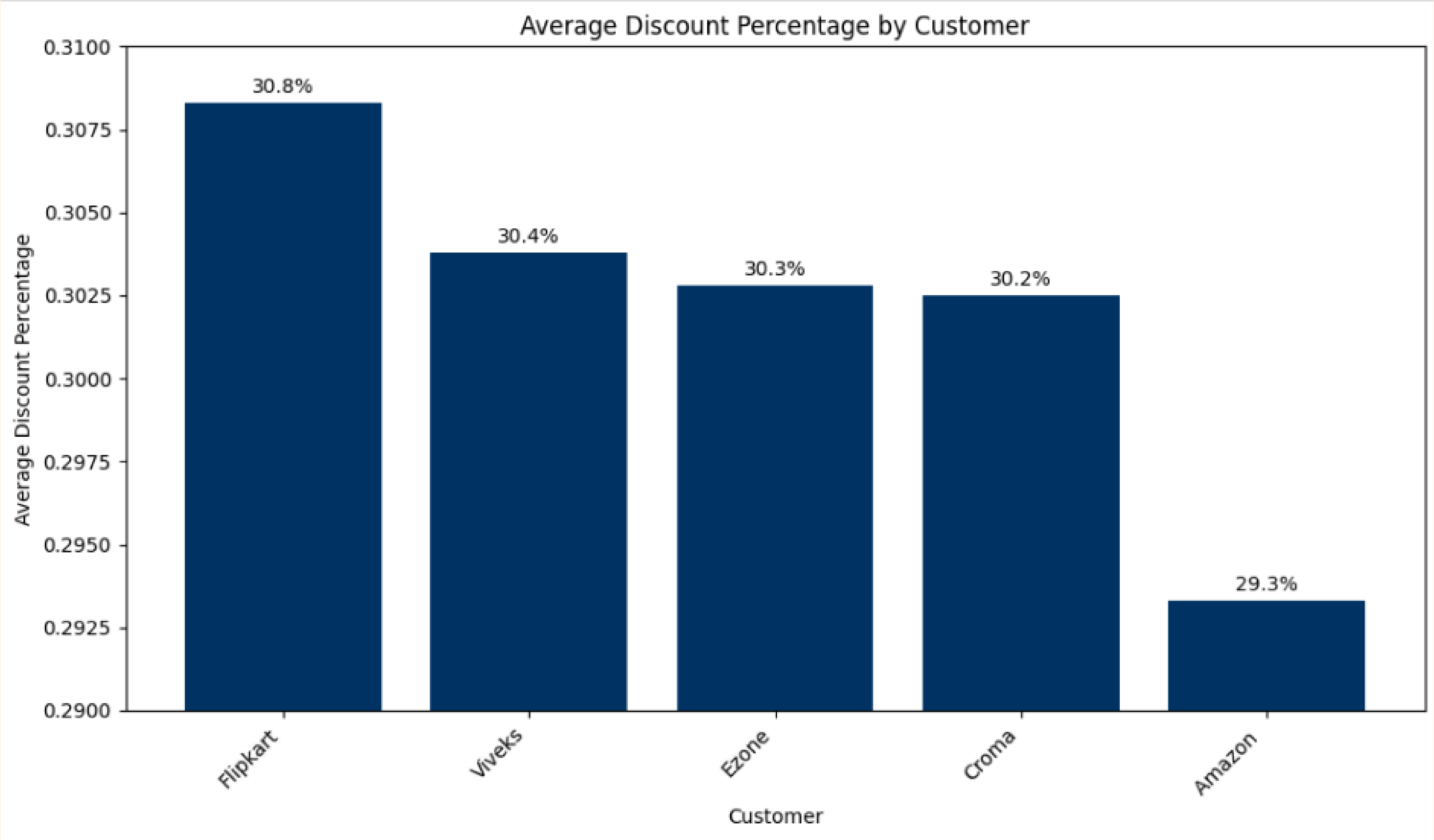


customer_code	customer	average_discount_percentage
90002009	Flipkart	0.30830000
90002006	Viveks	0.30380000
90002003	Ezone	0.30280000
90002002	Croma	0.30250000
90002016	Amazon	0.29330000

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



customer_code	customer	average_discount_percentage
90002009	Flipkart	0.30830000
90002006	Viveks	0.30380000
90002003	Ezone	0.30280000
90002002	Croma	0.30250000
90002016	Amazon	0.29330000

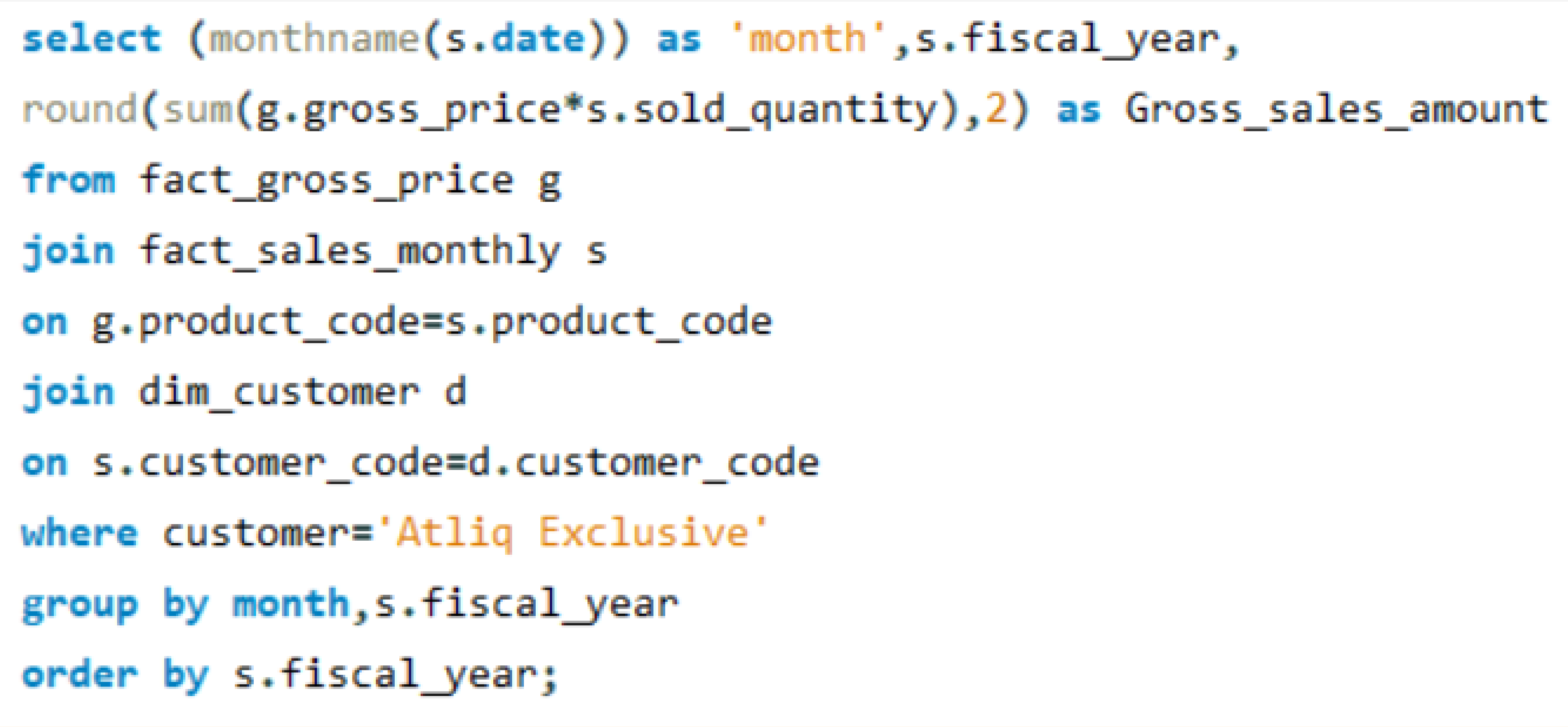


- Flipkart received the highest average pre-invoice discount.
- Amazon received the lowest average pre-invoice discount.

AD-HOC REQUEST 7

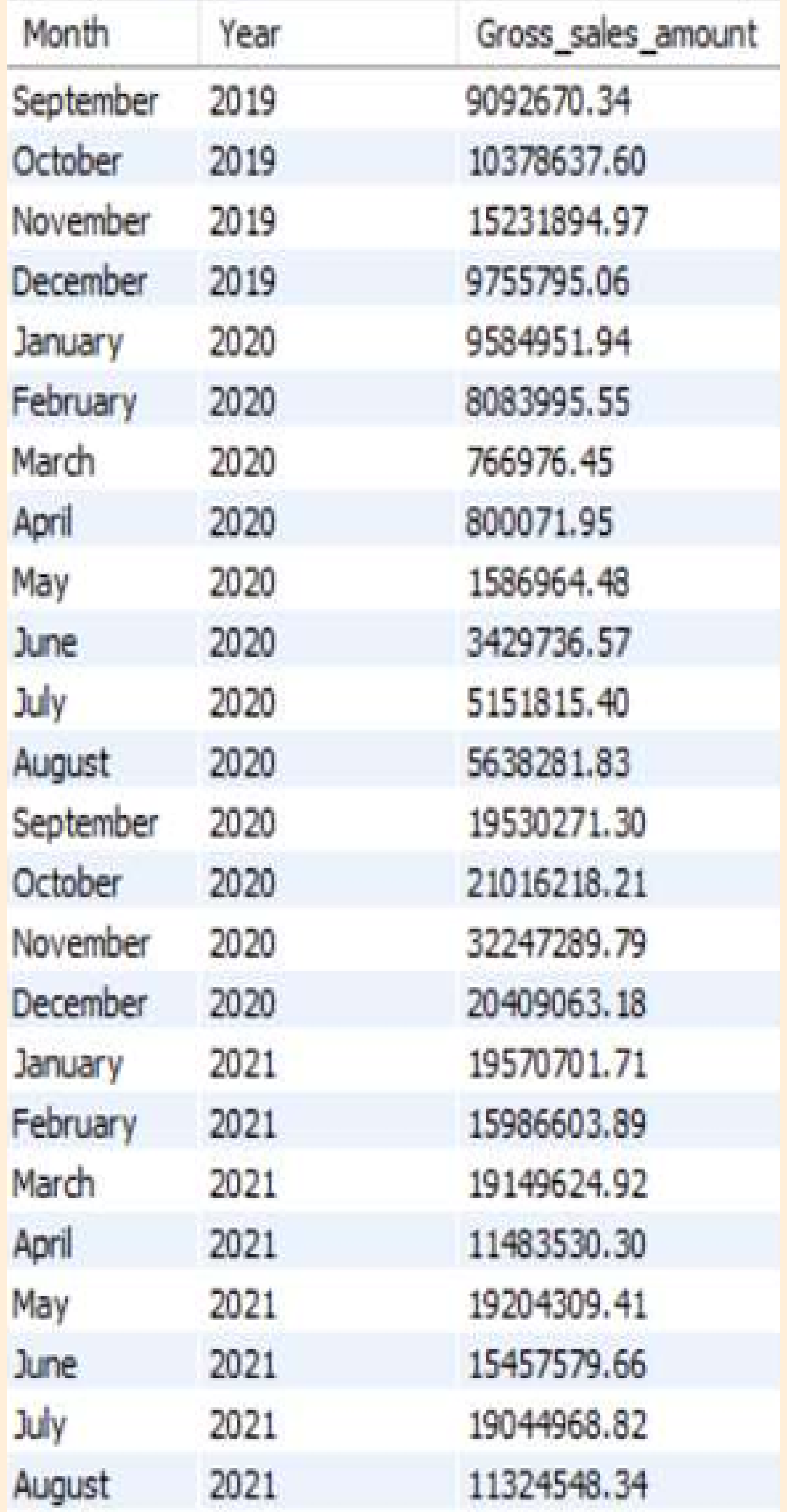
- Get the complete report of the Gross sales amount for the customer “Atliq Exclusive” for each month. This analysis helps to get an idea of low and high-performing months and make strategic decisions. The final report contains these columns:
  Month, Year, Gross sales Amount

SQL QUERY



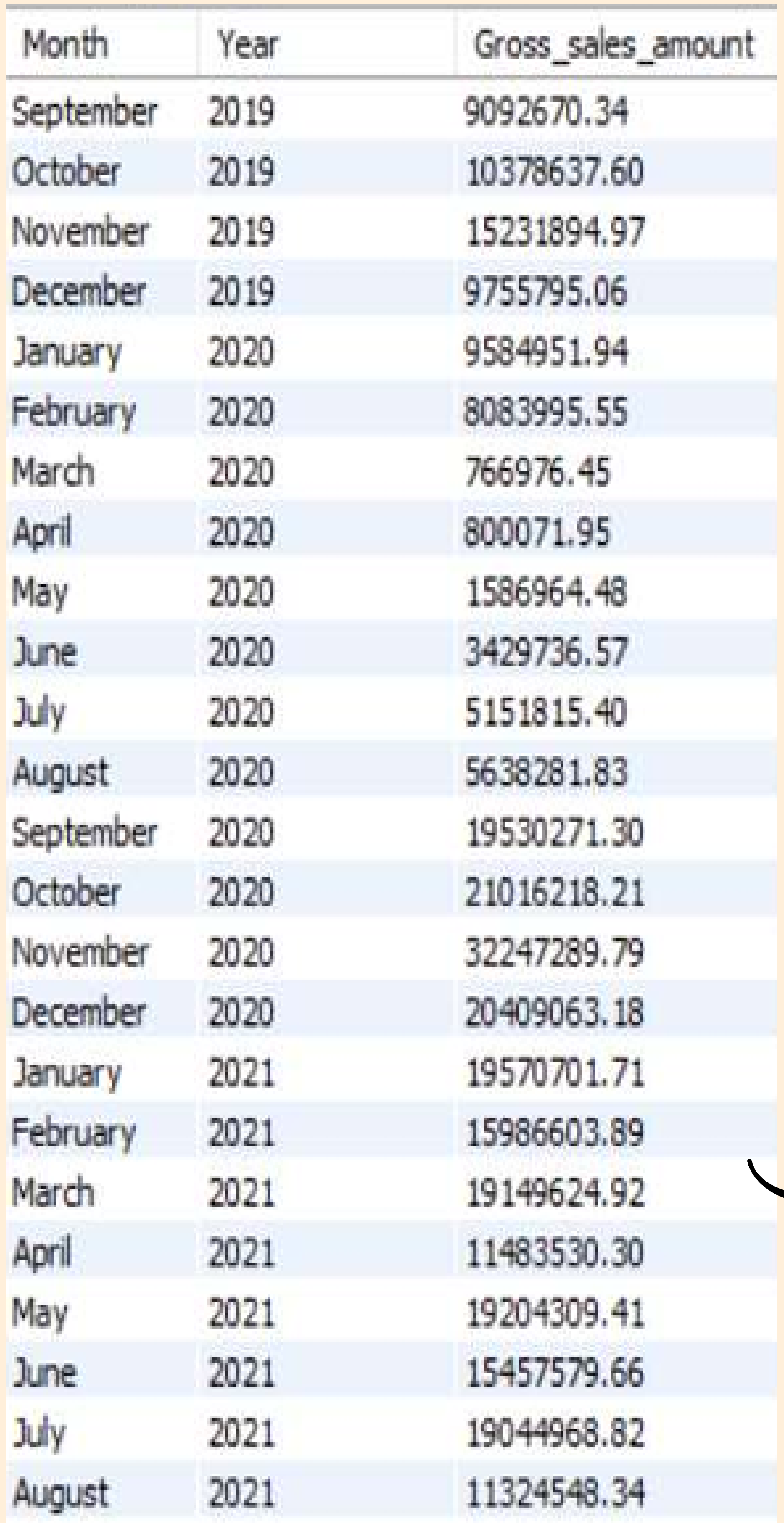
```
select (monthname(s.date)) as 'month',s.fiscal_year,
round(sum(g.gross_price*s.sold_quantity),2) as Gross_sales_amount
from fact_gross_price g
join fact_sales_monthly s
on g.product_code=s.product_code
join dim_customer d
on s.customer_code=d.customer_code
where customer='Atliq Exclusive'
group by month,s.fiscal_year
order by s.fiscal_year;
```

OUTPUT



Month	Year	Gross_sales_amount
September	2019	9092670.34
October	2019	10378637.60
November	2019	15231894.97
December	2019	9755795.06
January	2020	9584951.94
February	2020	8083995.55
March	2020	766976.45
April	2020	800071.95
May	2020	1586964.48
June	2020	3429736.57
July	2020	5151815.40
August	2020	5638281.83
September	2020	19530271.30
October	2020	21016218.21
November	2020	32247289.79
December	2020	20409063.18
January	2021	19570701.71
February	2021	15986603.89
March	2021	19149624.92
April	2021	11483530.30
May	2021	19204309.41
June	2021	15457579.66
July	2021	19044968.82
August	2021	11324548.34

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



Month	Year	Gross_sales_amount
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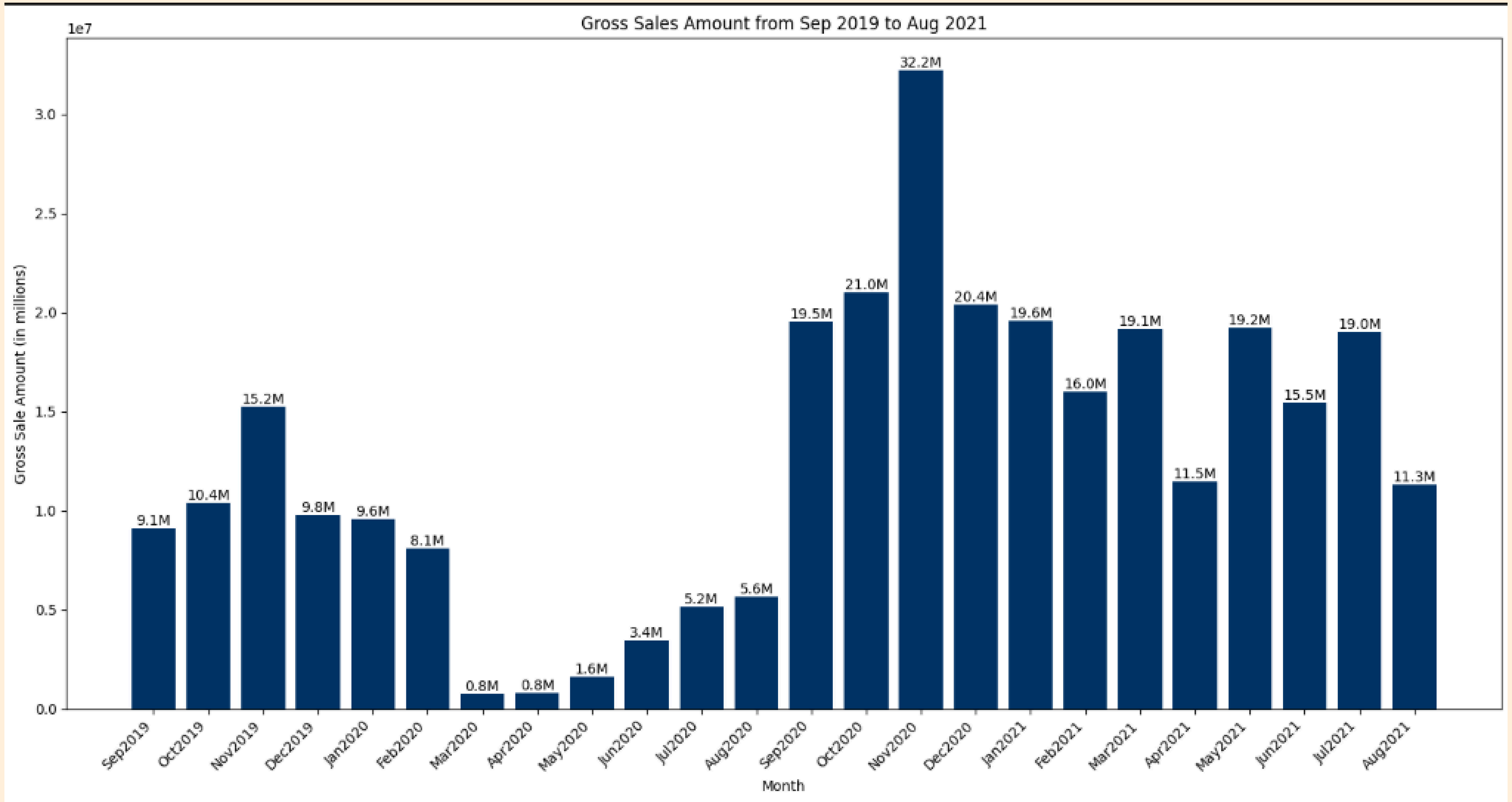
October	2019	10378637.60
November	2019	15231894.97
December	2019	9755795.06
January	2020	9584951.94
February	2020	8083995.55
March	2020	766976.45
April	2020	800071.95
May	2020	1586964.48
June	2020	3429736.57
July	2020	5151815.40
August	2020	5638281.83
September	2020	19530271.30
October	2020	21016218.21
November	2020	32247289.79
December	2020	20409063.18
January	2021	19570701.71
February	2021	15986603.89
March	2021	19149624.92
April	2021	11483530.30
May	2021	19204309.41
June	2021	15457579.66
July	2021	19044968.82
August	2021	11324548.34

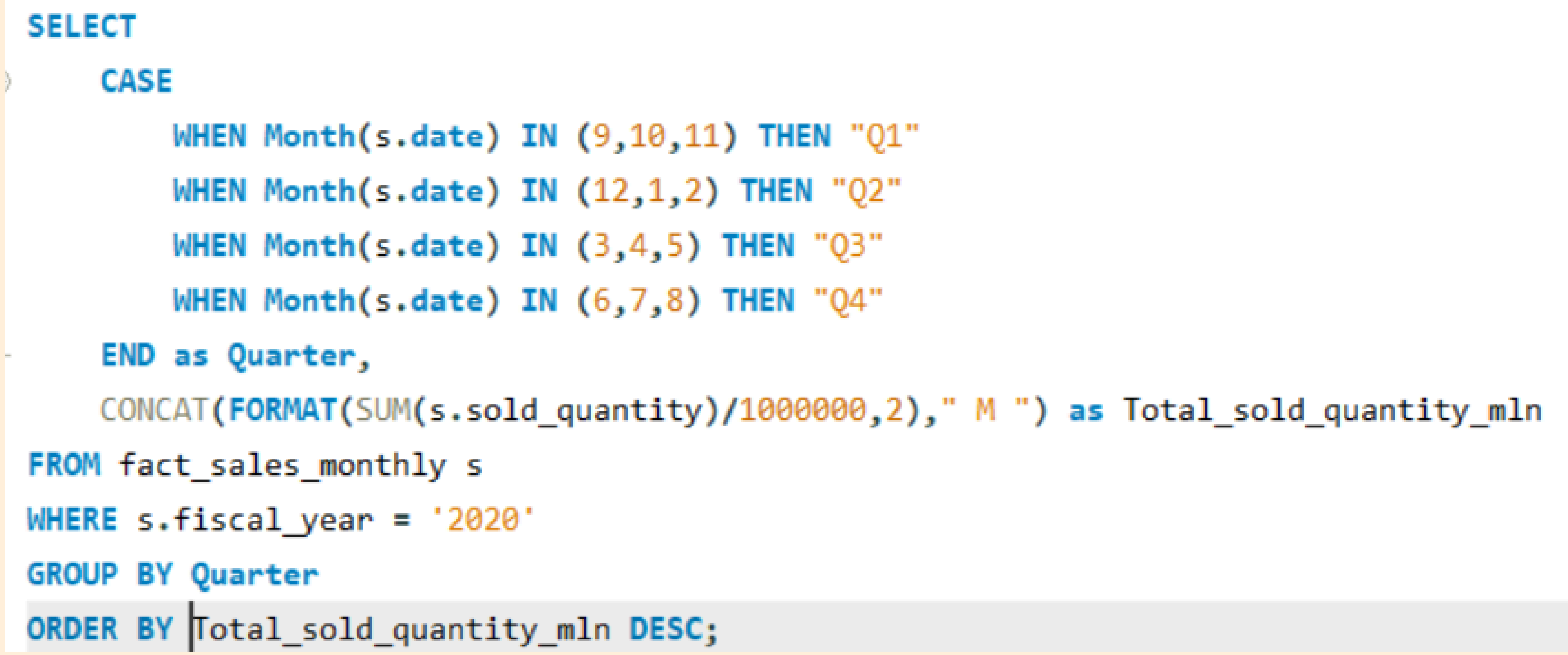


- AtliQExclusive sold the most stuff in November 2020 and the least in March 2020.
- Sales dropped from March to August because of COVID-19. But now, things are looking up. Sales have been going up and are even better than they were in 2020.

AD-HOC REQUEST 8

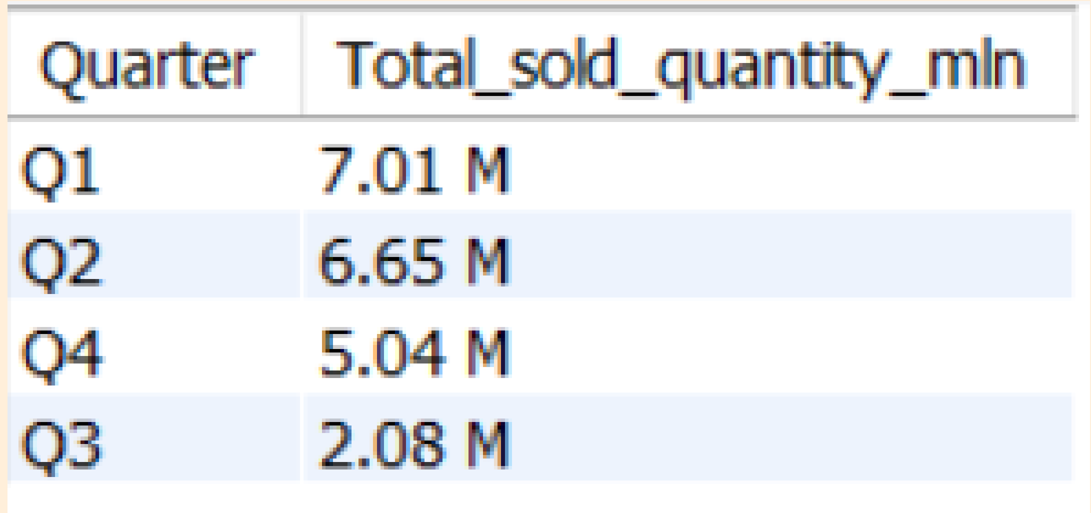
- In which quarter of 2020, get the maximum total_sold_quantity? The final output contains these fields sorted by the total_sold_quantity,
  Quarter, total_sold_quantity _mln

SQL QUERY



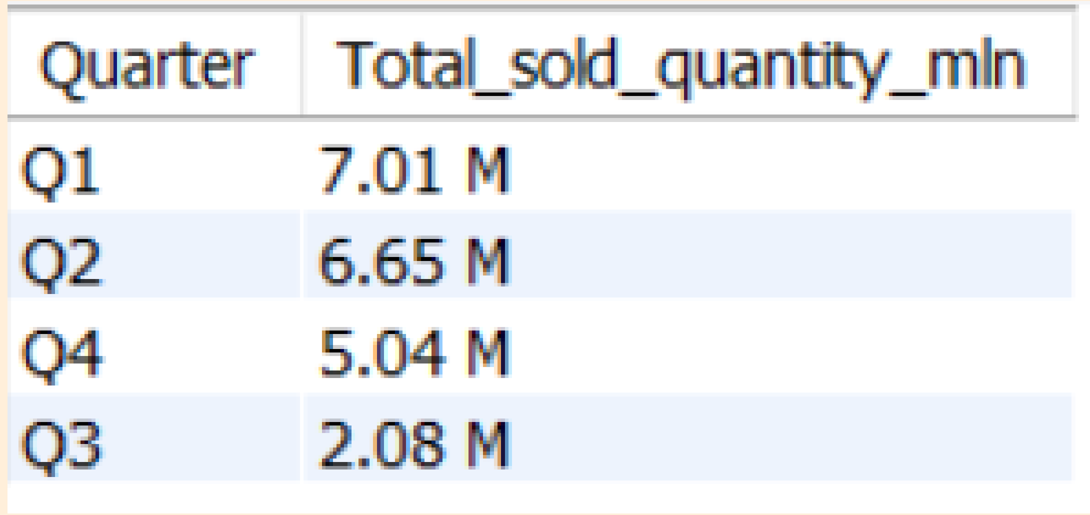
```
SELECT
    CASE
        WHEN Month(s.date) IN (9,10,11) THEN "Q1"
        WHEN Month(s.date) IN (12,1,2) THEN "Q2"
        WHEN Month(s.date) IN (3,4,5) THEN "Q3"
        WHEN Month(s.date) IN (6,7,8) THEN "Q4"
    END as Quarter,
    CONCAT(FORMAT(SUM(s.sold_quantity)/1000000,2)," M ") as Total_sold_quantity_mln
FROM fact_sales_monthly s
WHERE s.fiscal_year = '2020'
GROUP BY Quarter
ORDER BY Total_sold_quantity_mln DESC;
```

OUTPUT

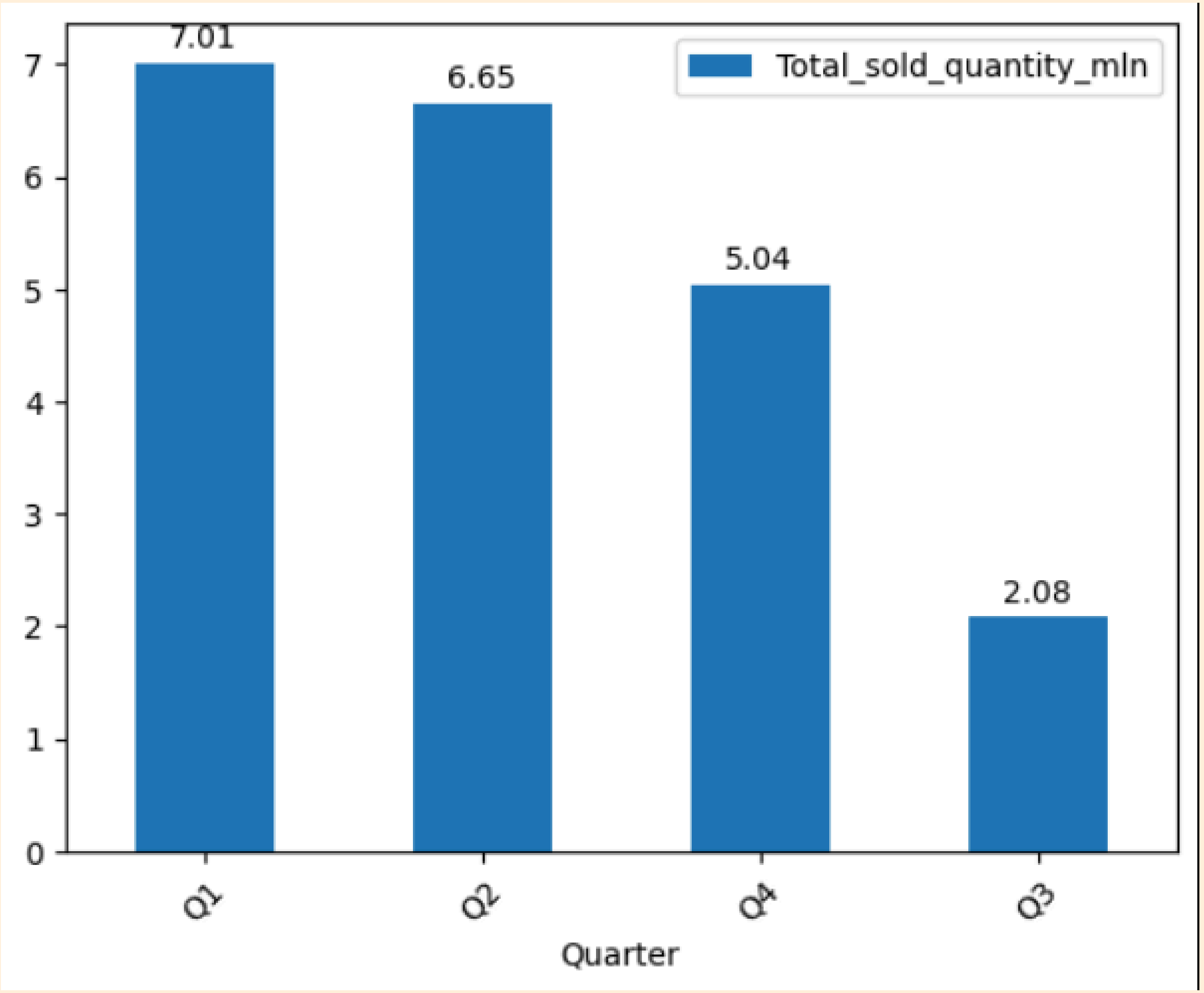


Quarter	Total_sold_quantity_mln
Q1	7.01 M
Q2	6.65 M
Q4	5.04 M
Q3	2.08 M

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



Quarter	Total_sold_quantity_mln
Q1	7.01 M
Q2	6.65 M
Q4	5.04 M
Q3	2.08 M

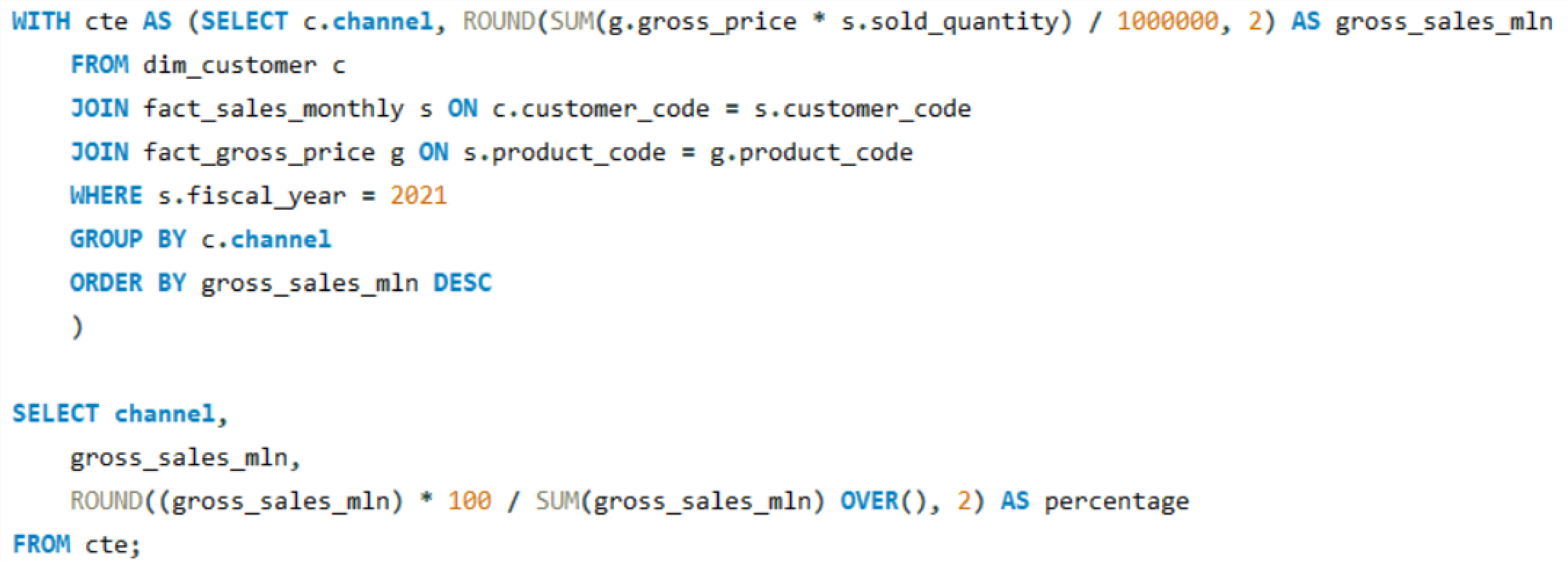


- The **highest** number of units sold across all quarters occurred in **Quarter 1** of FY2020, whereas Quarter 3 recorded the lowest sales.
- Approximately **34%** of the total quantity sold in FY2020 is attributed to **Quarter 1**.

AD-HOC REQUEST 9

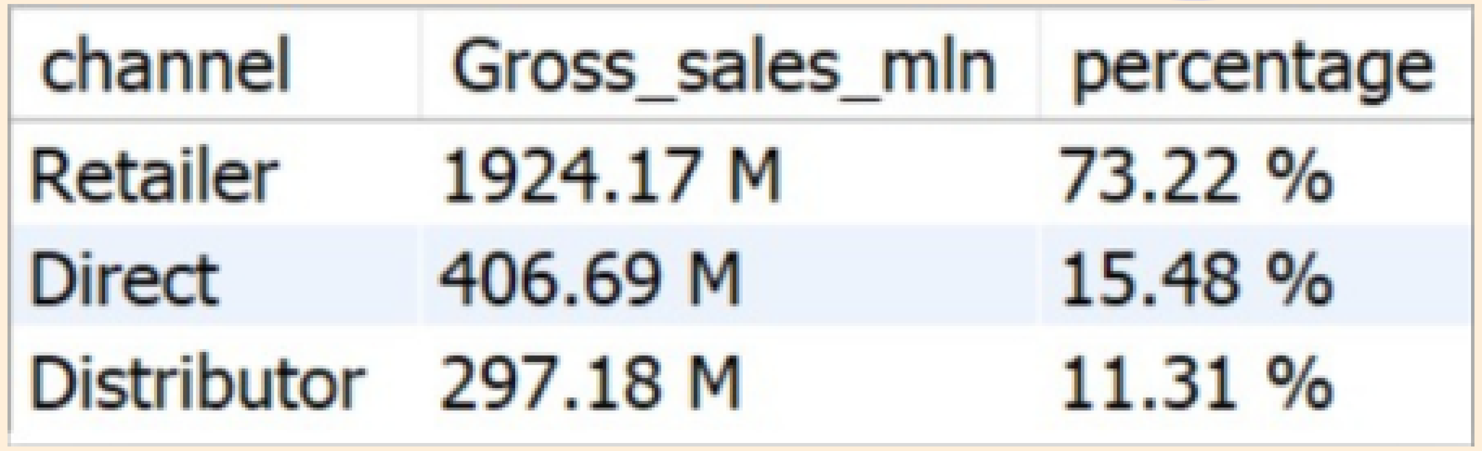
- Which channel helped to bring more gross sales in the fiscal year 2021 and the percentage of contribution? The final output contains these fields, channel, gross_sales_mln, percentage

SQL QUERY



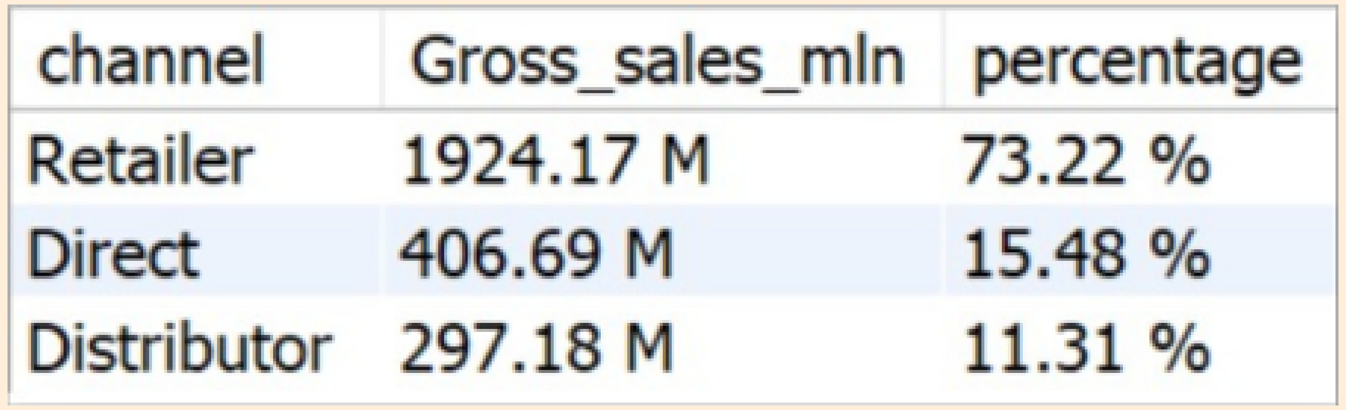
```
WITH cte AS (SELECT c.channel, ROUND(SUM(g.gross_price * s.sold_quantity) / 1000000, 2) AS gross_sales_mln
    FROM dim_customer c
    JOIN fact_sales_monthly s ON c.customer_code = s.customer_code
    JOIN fact_gross_price g ON s.product_code = g.product_code
    WHERE s.fiscal_year = 2021
    GROUP BY c.channel
    ORDER BY gross_sales_mln DESC
    )

SELECT channel,
    gross_sales_mln,
    ROUND((gross_sales_mln) * 100 / SUM(gross_sales_mln) OVER(), 2) AS percentage
FROM cte;
```

OUTPUT

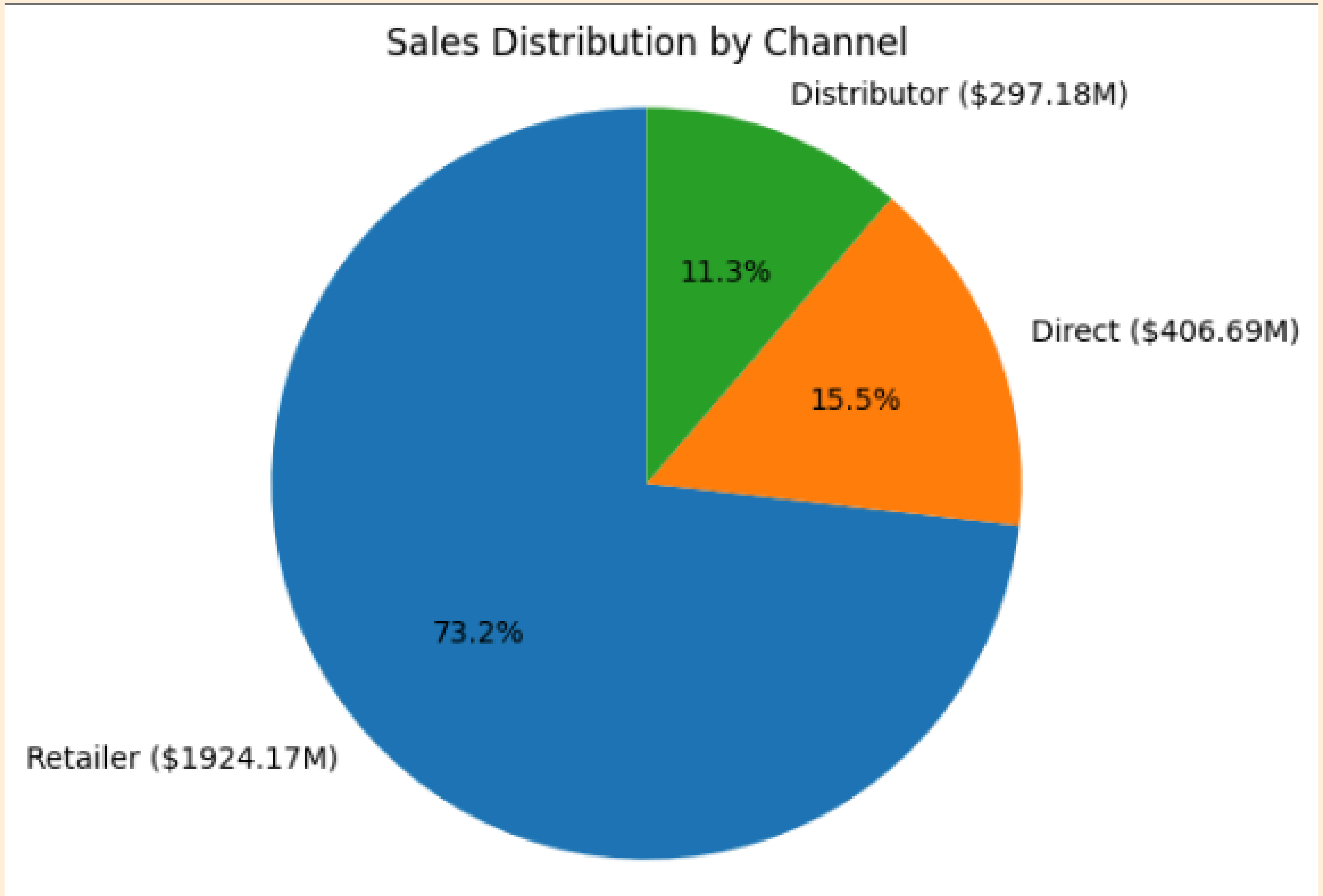


channel	Gross_sales_mln	percentage
Retailer	1924.17 M	73.22 %
Direct	406.69 M	15.48 %
Distributor	297.18 M	11.31 %

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



channel	Gross_sales_mln	percentage
Retailer	1924.17 M	73.22 %
Direct	406.69 M	15.48 %
Distributor	297.18 M	11.31 %

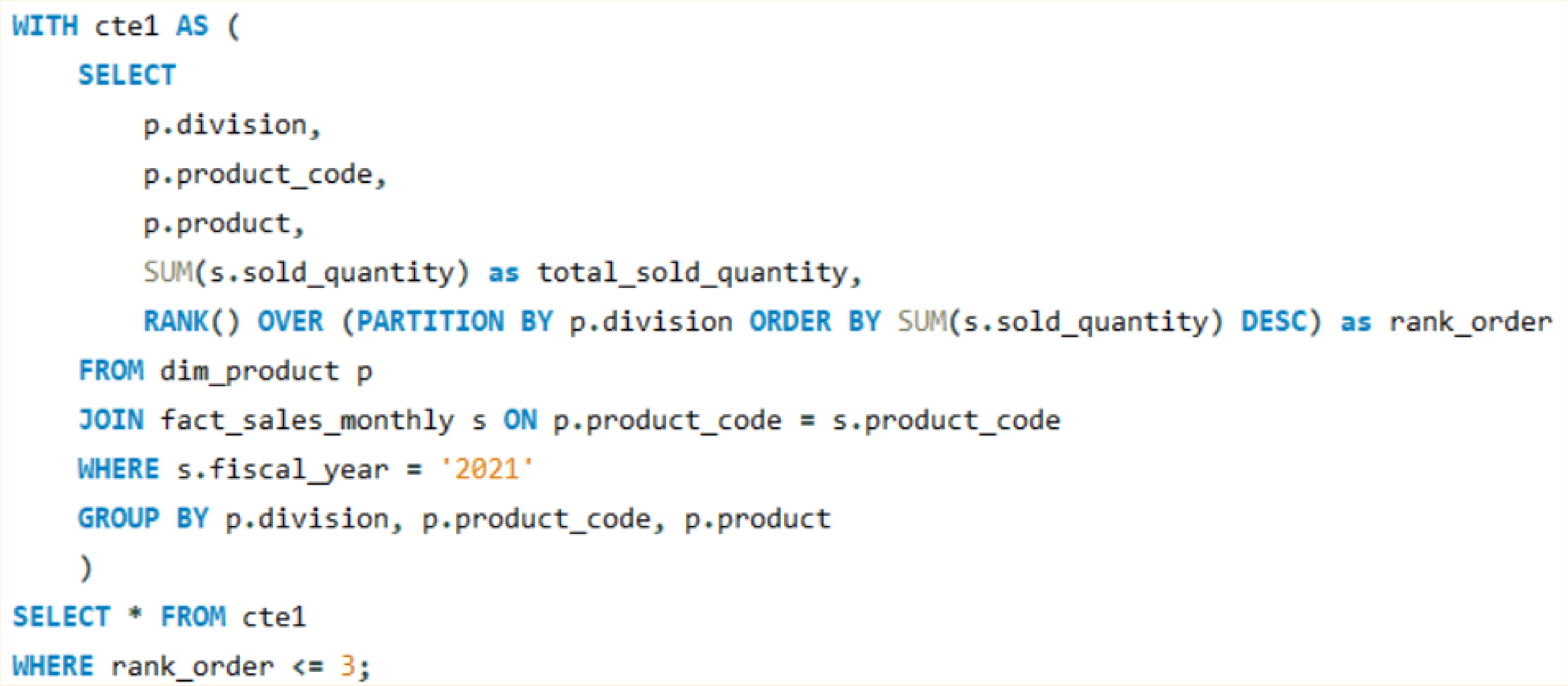


Most of our sales occurred through Retailer, constituting 75% of the overall sales. Only a minimal portion of our sales occurred directly and via distributor channels.

AD-HOC REQUEST 10

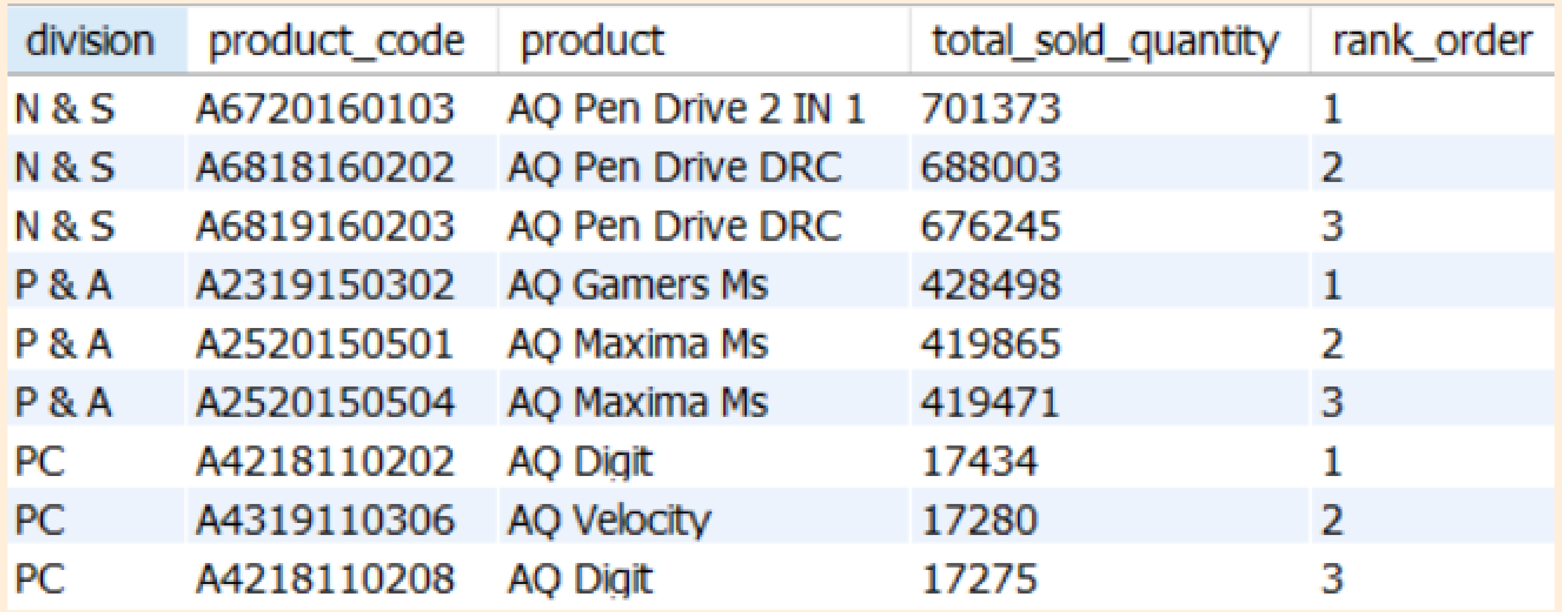
- Get the Top 3 products in each division that have a high total_sold_quantity in the fiscal_year 2021? The final output contains these fields, division, product_code, product, total_sold_quantity, rank_order

SQL QUERY



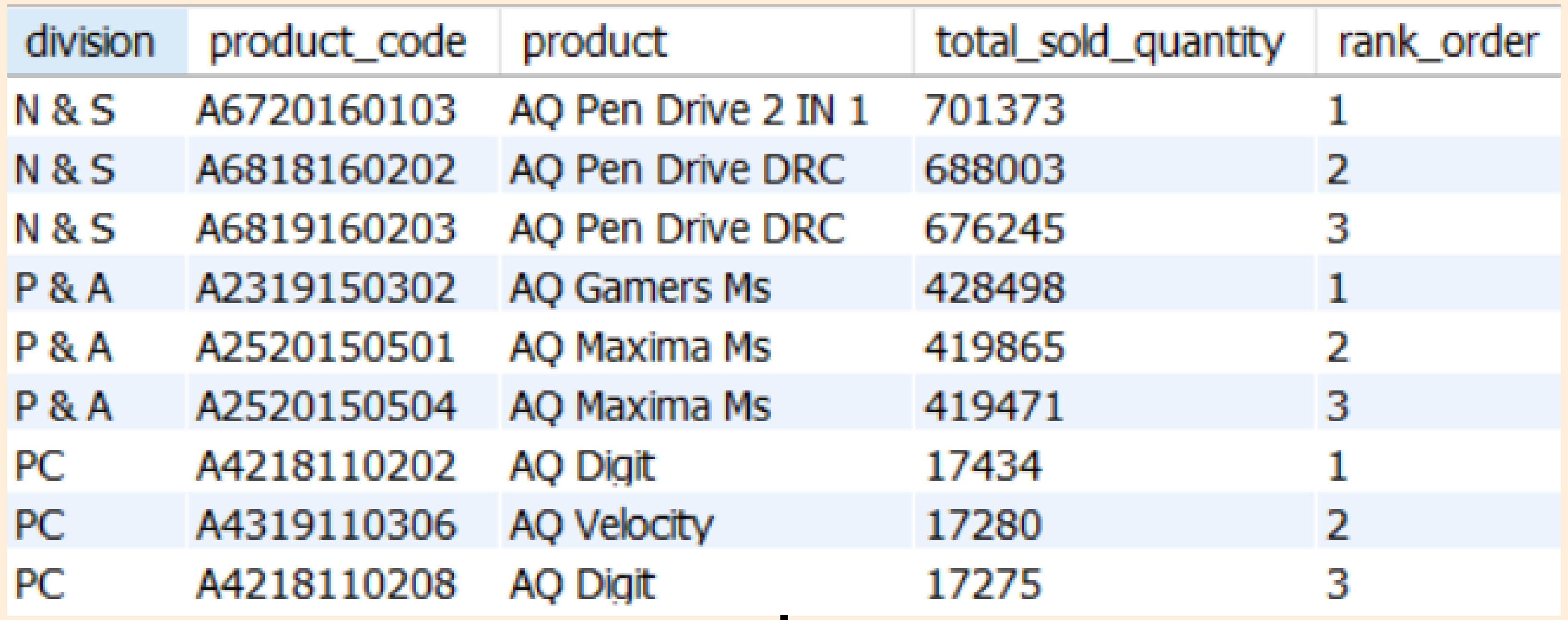
```sql
WITH cte1 AS (
    SELECT
        p.division,
        p.product_code,
        p.product,
        SUM(s.sold_quantity) as total_sold_quantity,
        RANK() OVER (PARTITION BY p.division ORDER BY SUM(s.sold_quantity) DESC) as rank_order
    FROM dim_product p
    JOIN fact_sales_monthly s ON p.product_code = s.product_code
    WHERE s.fiscal_year = '2021'
    GROUP BY p.division, p.product_code, p.product
    )
SELECT * FROM cte1
WHERE rank_order <= 3;
```

OUTPUT



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

CONVERSION OF OUTPUT TO VISUAL AND INSIGHTS



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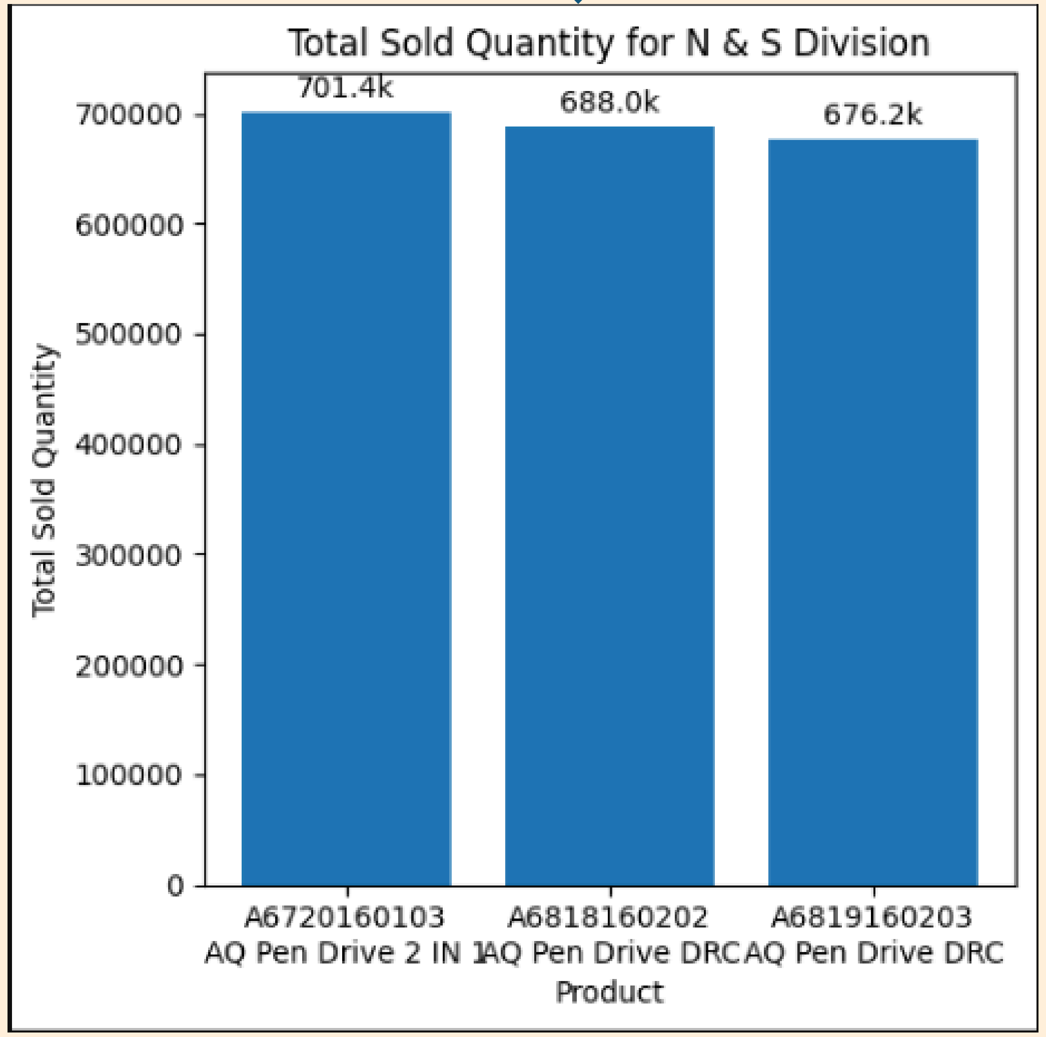
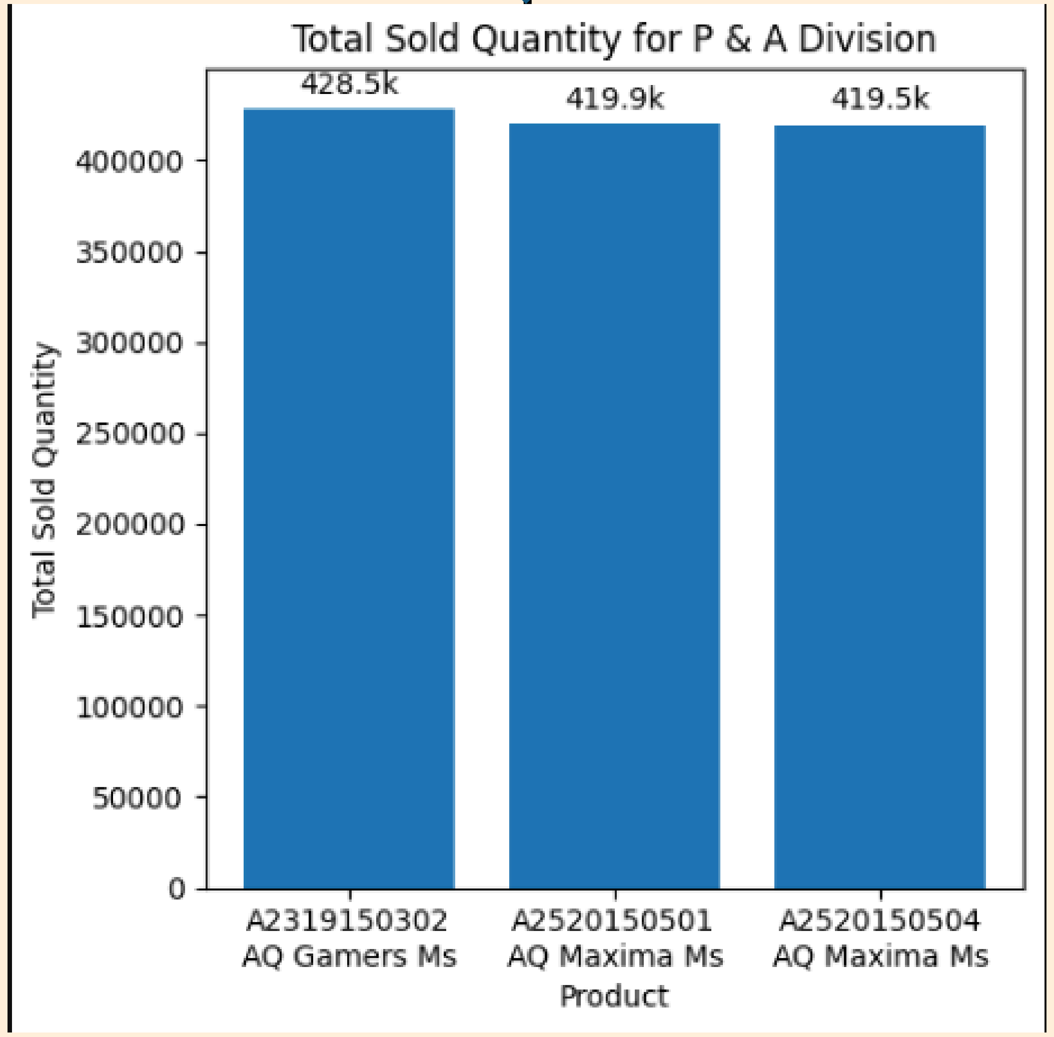
PC	A4218110208	AQ Digit	17275	3

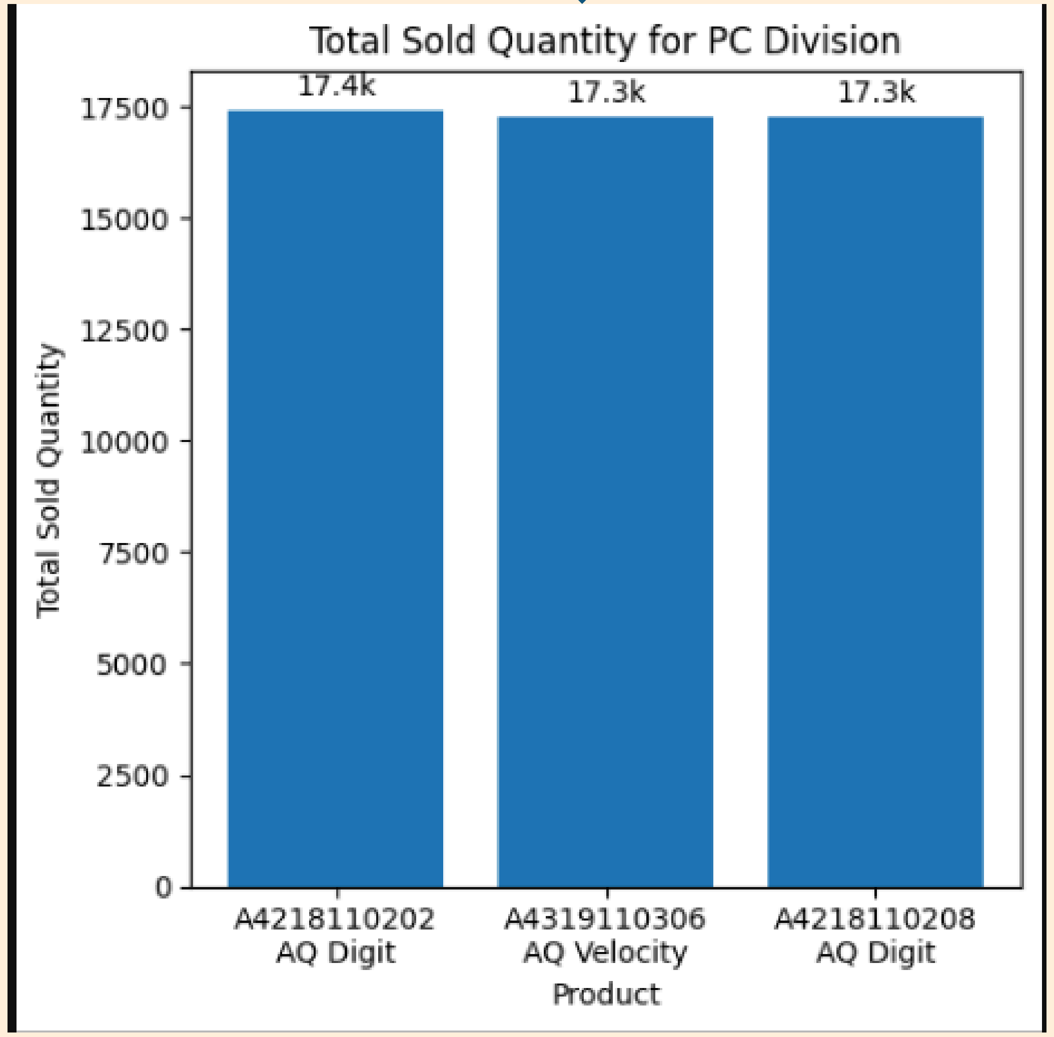
The leading 3 products, Division-wise



Total Sold Quantity for N & S Division



Total Sold Quantity for P & A Division



Total Sold Quantity for PC Division

THANK YOU