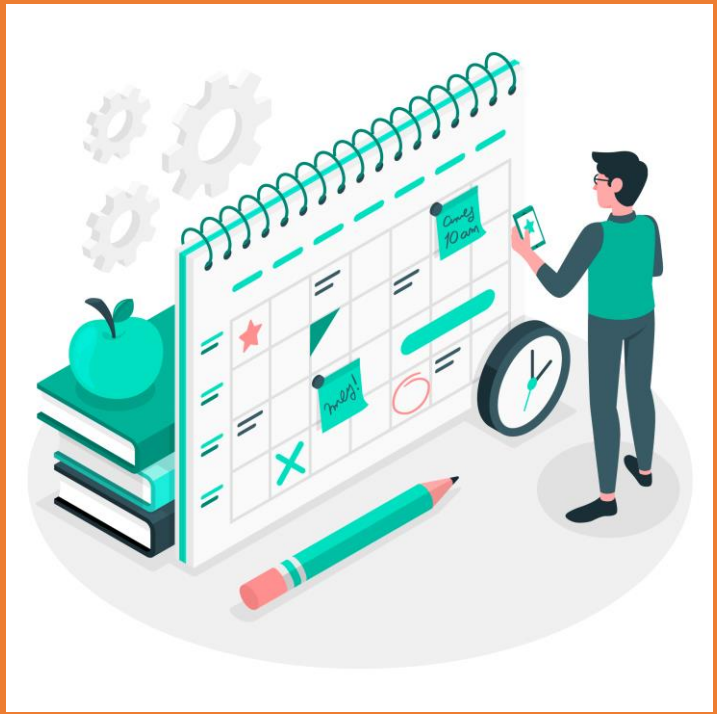
Consumer Goods
Ad Hoc Insights

Provide Insights to Management in Consumer Goods Domain

❑ Agenda

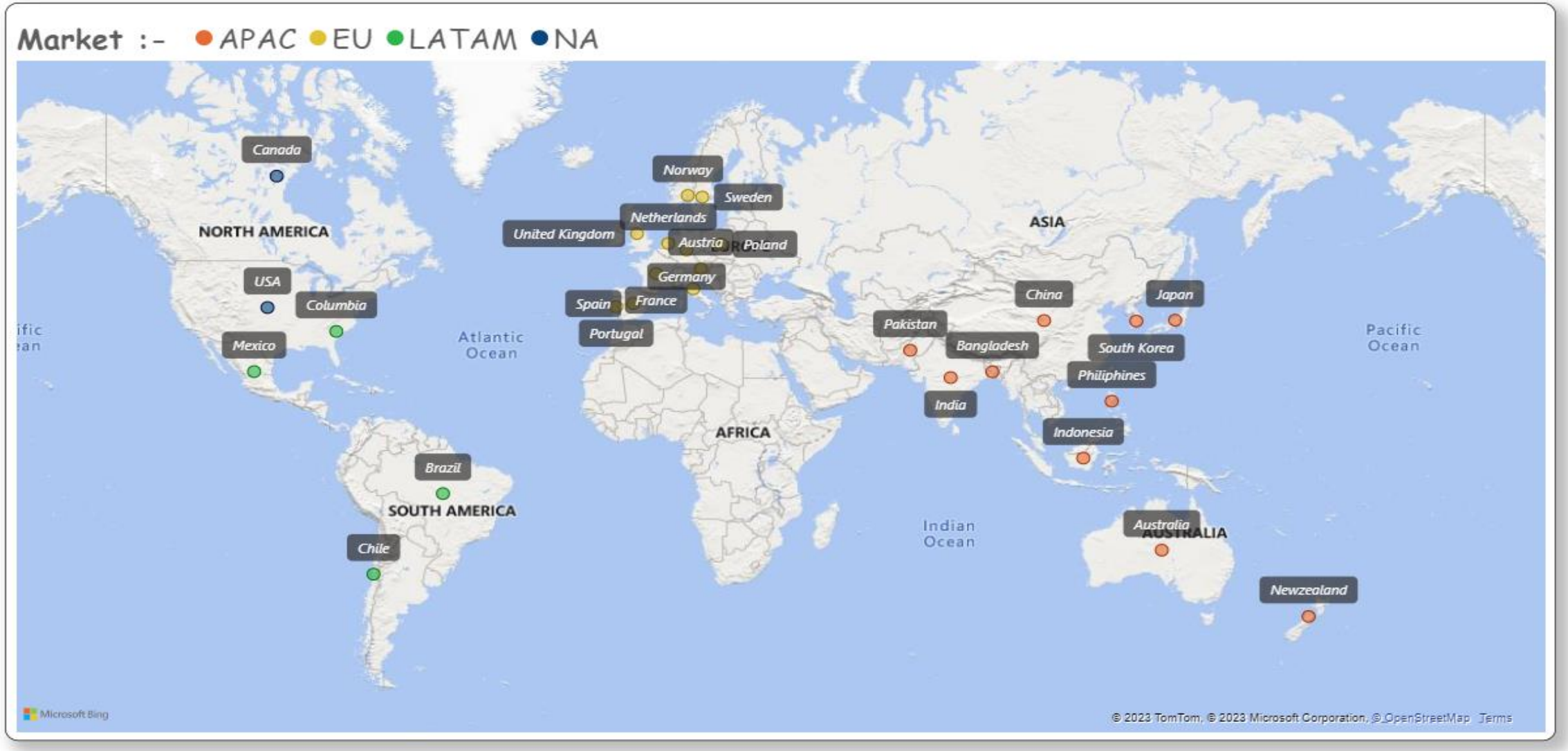


- Introduction and Background
- Company Market & Product lines
- Input Data
- Ad-hoc Requests, Query & Output
- Visualization & Insights

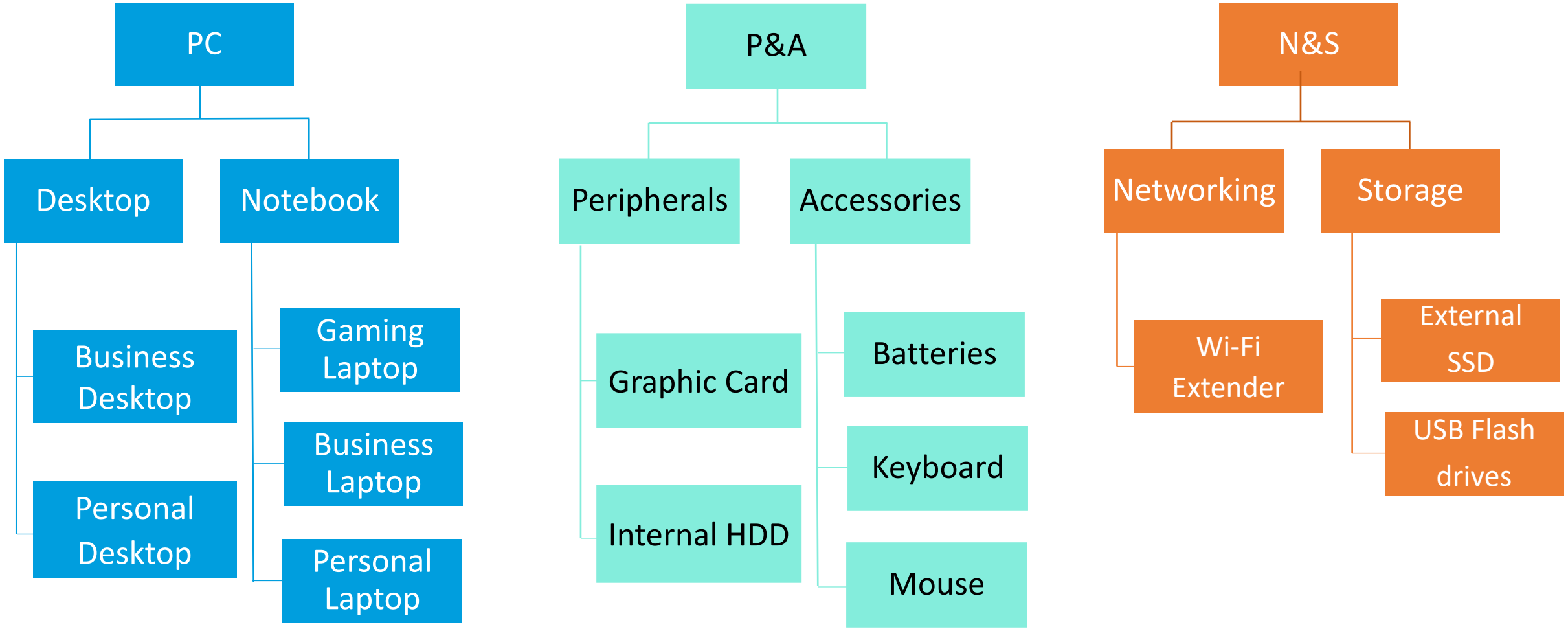
❑ Introduction

- **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's Market

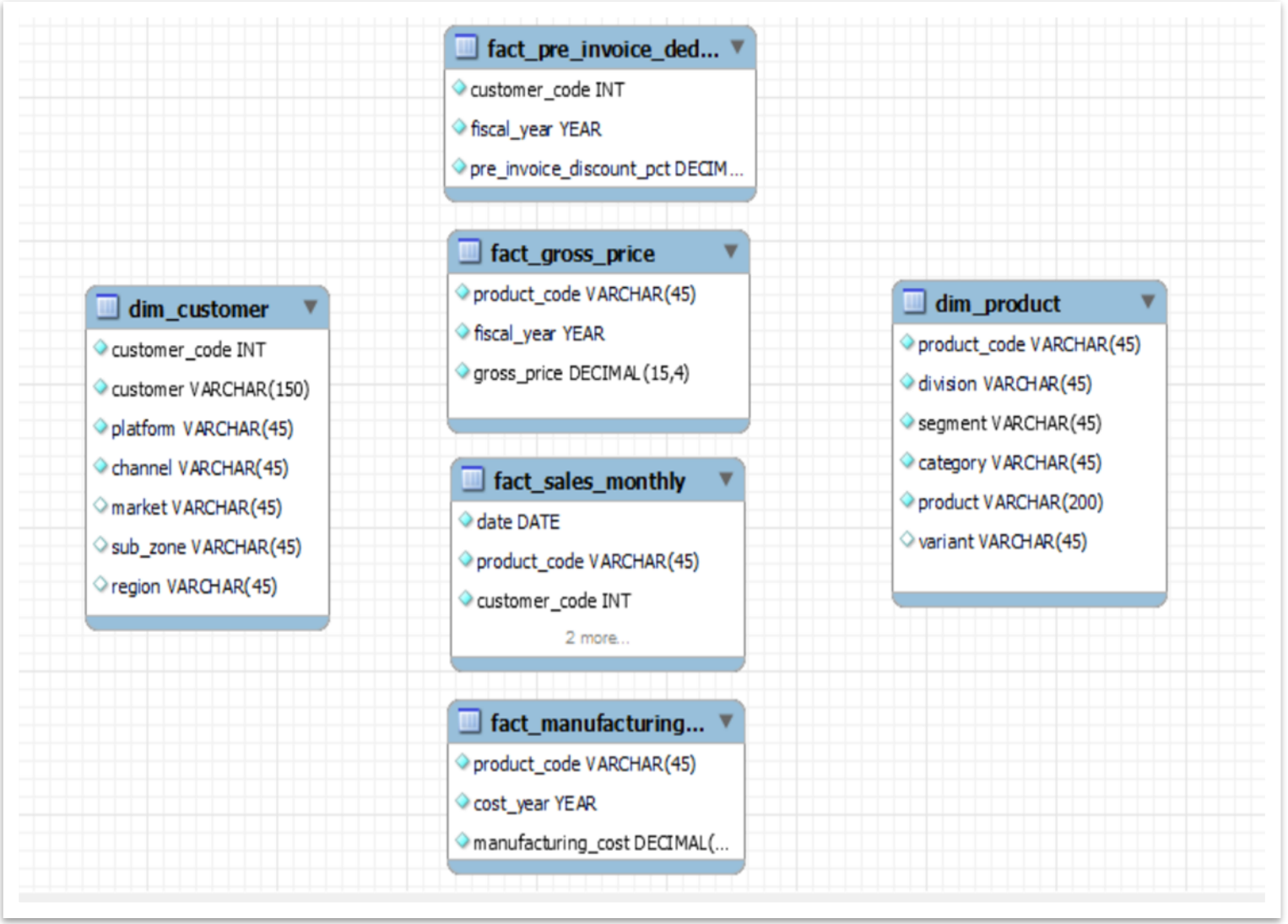


❑ Atliq's Product lines



❑ Input Data

- Input data consists of sales data for FY 2020 and FY 2021, along with different other dimension tables like customer details, product details, etc.



❑ Ad hoc Requests

Codebasics SQL Challenge

Requests:

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

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

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

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

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

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

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

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

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

Tools Used :-

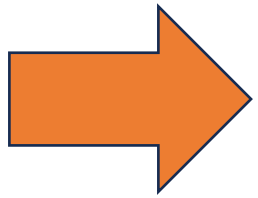
- SQL

- MS Excel

❖ Request No. 1

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

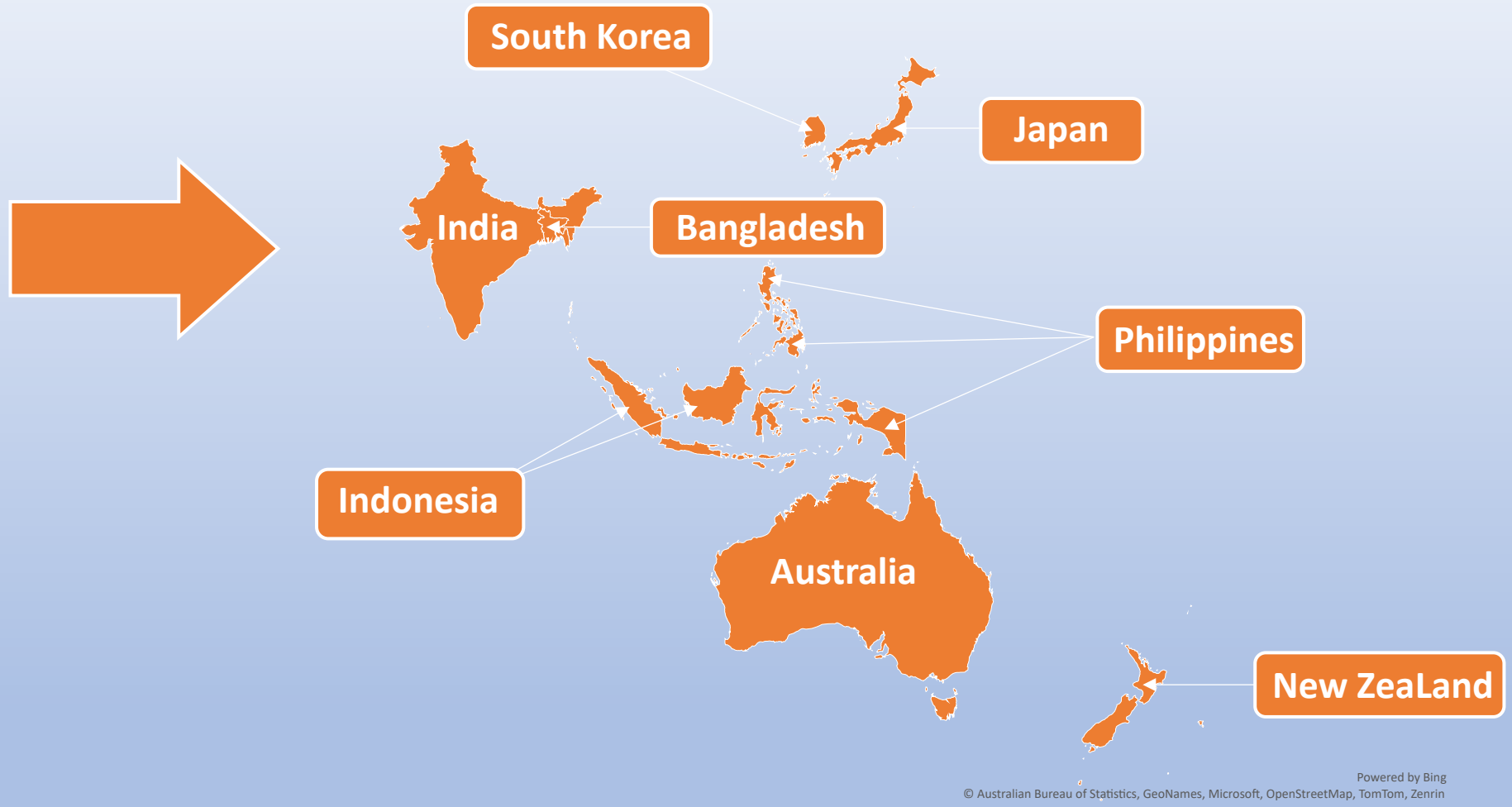
```
1    SELECT
2        DISTINCT market
3    FROM dim_customer
4    WHERE
5        customer='Atliq Exclusive'
6        AND region='APAC';
```



market
India
Indonesia
Japan
Philiphines
South Korea
Australia
Newzealand
Bangladesh

Visualization | Insights

market
India
Indonesia
Japan
Philiphines
South Korea
Australia
Newzealand
Bangladesh



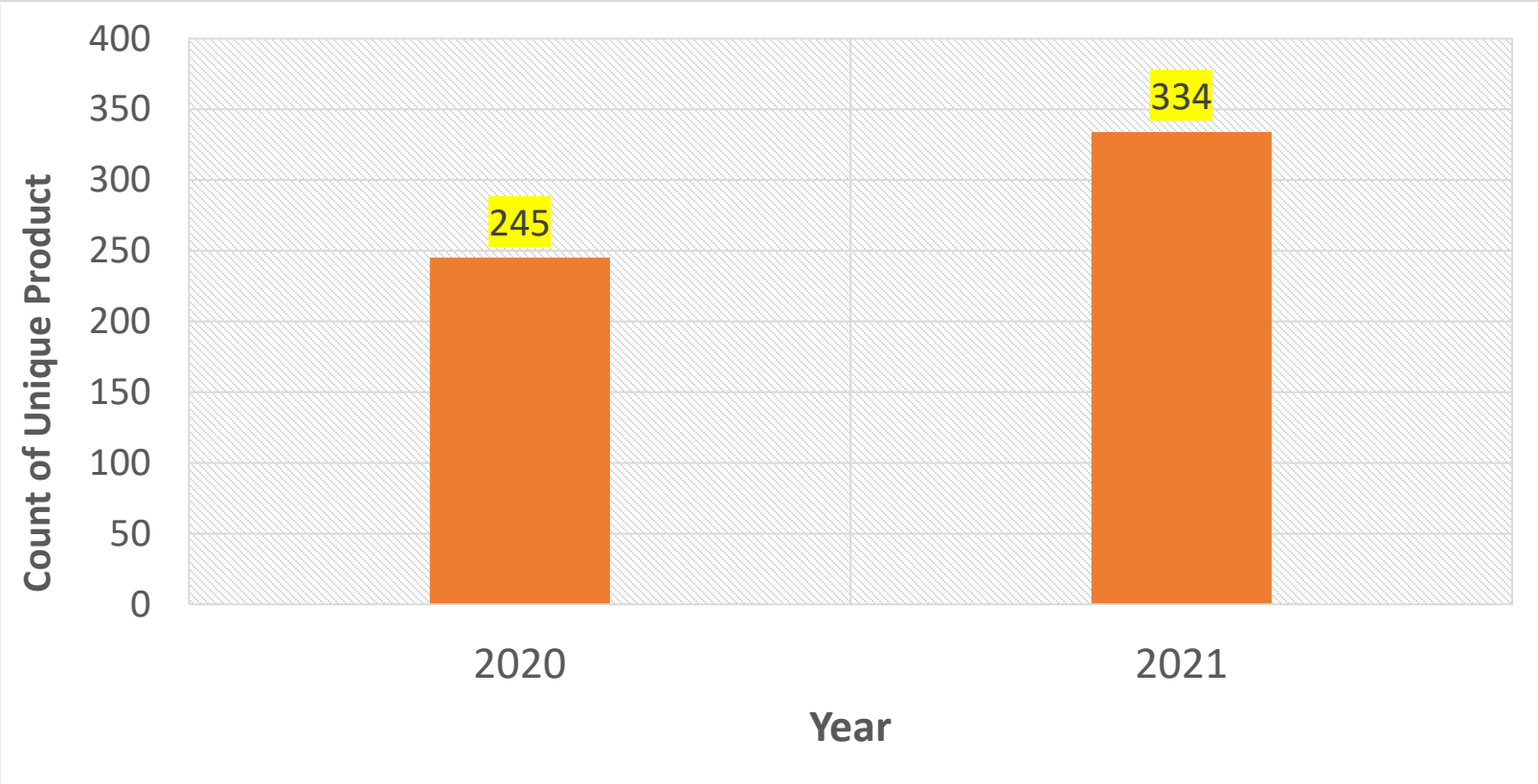
❖ Request No. 2

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

```sql
WITH product_count AS (
    SELECT
        (SELECT COUNT(DISTINCT product_code)
        FROM fact_sales_monthly WHERE fiscal_year = 2020)
        AS unique_products_2020,

        (SELECT COUNT(DISTINCT product_code)
        FROM fact_sales_monthly WHERE fiscal_year = 2021)
        AS unique_products_2021
    FROM  fact_sales_monthly
    LIMIT 1
)
SELECT
    unique_products_2020,
    unique_products_2021,
    ROUND((unique_products_2021 - unique_products_2020)*100/unique_products_2020,2)
    AS percentage_chg
From product_count;
```

Visualization | Insights

unique_products_2020	unique_products_2021	percentage_chg
245	334	36.33



36.33
% Increase

It's a good sign that we are continuously innovating and introducing new products to the market. **In FY 2020, we had a total of 245 products,** but **In FY 2021, our count increased by 36% to 334 products.**

❖ Request No. 3

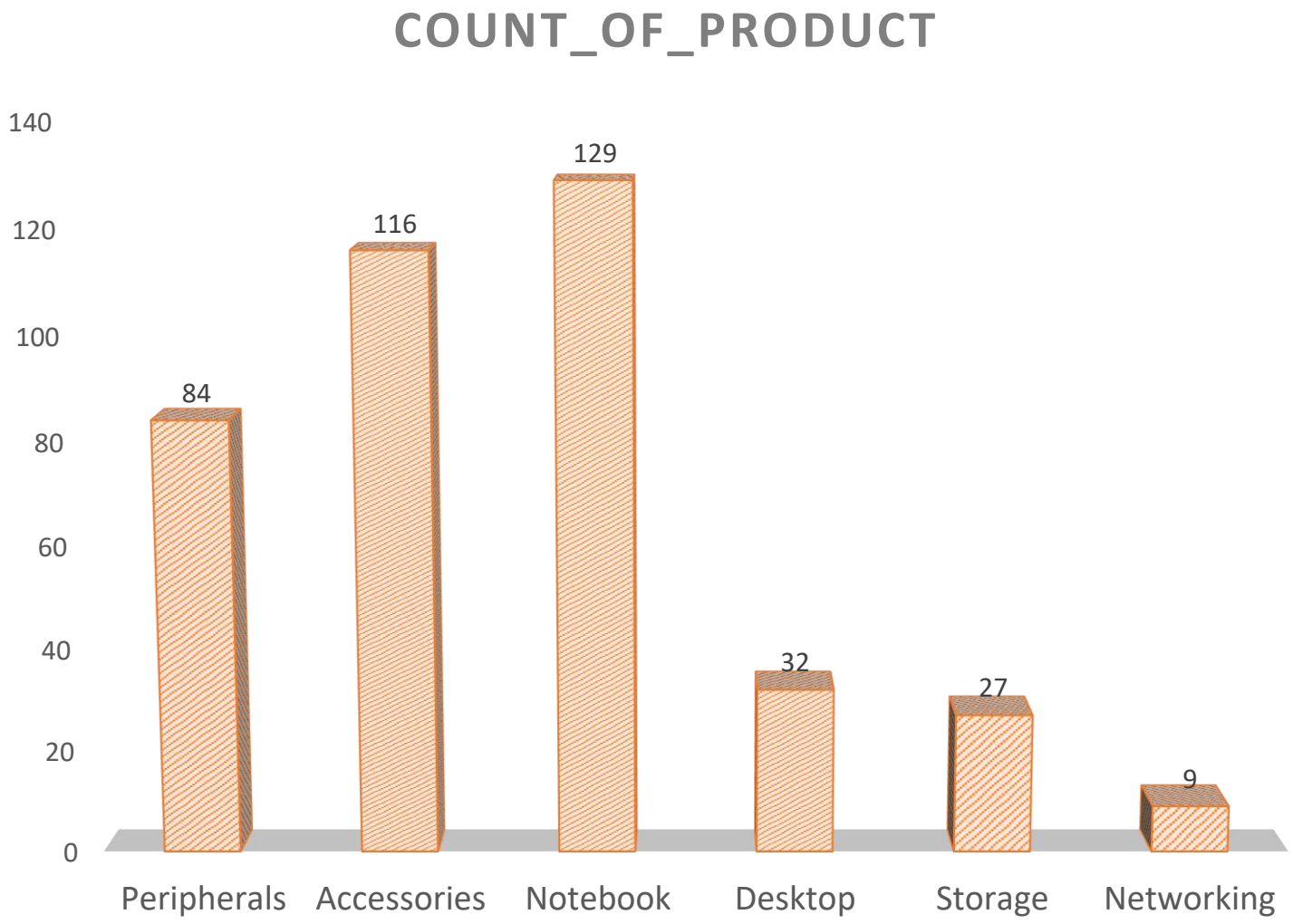
Provide a report with all the unique product counts for each segment and sort them in descending order of product counts.

```
1  Select segment,
2         count(product_code) as Count_of_Product
3  from dim_product
4  group by segment;
```

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

Visualization | Insights

We provide a wide range of products under the segments **Notebook, Peripherals, and Accessories, with an average of 110 products in each segment.** However we still need to diversify our production in the **Desktop, Networking, and Storage segments,** where there are just an **average of only 23 products per segment.**



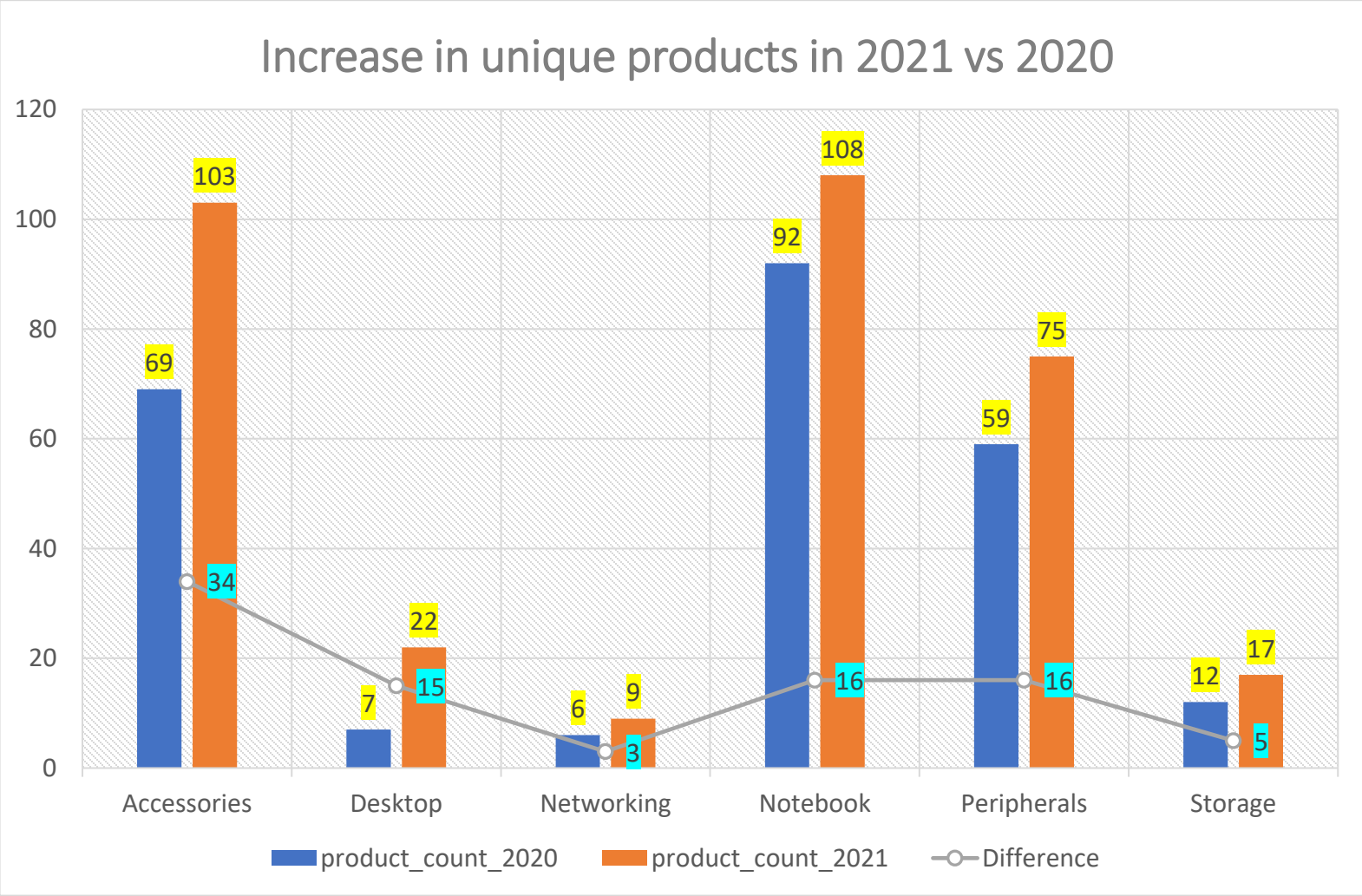
❖ Request No. 4

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

```sql
WITH CTE1 AS
    (SELECT P.segment AS A , COUNT(DISTINCT(FS.product_code)) AS B
    FROM dim_product P, fact_sales_monthly FS
    WHERE P.product_code = FS.product_code
    GROUP BY FS.fiscal_year, P.segment
    HAVING FS.fiscal_year = "2020"),
CTE2 AS
    (
    SELECT P.segment AS C , COUNT(DISTINCT(FS.product_code)) AS D
    FROM dim_product P, fact_sales_monthly FS
    WHERE P.product_code = FS.product_code
    GROUP BY FS.fiscal_year, P.segment
    HAVING FS.fiscal_year = "2021"
    )

SELECT CTE1.A AS segment, CTE1.B AS product_count_2020,
CTE2.D AS product_count_2021, (CTE2.D-CTE1.B) AS difference
FROM CTE1, CTE2
WHERE CTE1.A = CTE2.C ;
```

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

Visualization | Insights



In 2021, we were mainly focusing on diversifying **our accessories segment.** We introduced **34 new products** to the market in accessories.

❖ Request No. 5

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

https://github.com/Iam-Aryan/Ad_hoc_Analysis/blob/master/Ad%20Hoc%20SQL%20codes/Request%205.sql

```sql
SELECT F.product_code, P.product, F.manufacturing_cost
FROM fact_manufacturing_cost F JOIN dim_product P
ON F.product_code = P.product_code
WHERE manufacturing_cost
IN (
    SELECT MAX(manufacturing_cost) FROM fact_manufacturing_cost
    UNION
    SELECT MIN(manufacturing_cost) FROM fact_manufacturing_cost
    )
ORDER BY manufacturing_cost DESC ;
```

Visualization | Insights

product_code	product	manufacturing_cost
A6120110206	AQ HOME Allin1 Gen 2	240.5364
A2118150101	AQ Master wired x1 Ms	0.892

Products having the highest and lowest manufacturing costs

$240.5422

A6120110206
AQ HOME Allin1 Gen 2
Personal Desktop

$0.892

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 Allinl Gen2 (Variant: Plus 3) has the highest manufacturing cost

❖ Request No. 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.

```sql
WITH TBL1 AS
(SELECT customer_code AS A, AVG(pre_invoice_discount_pct) AS B
FROM fact_pre_invoice_deductions
WHERE fiscal_year = '2021'
GROUP BY customer_code),
     TBL2 AS
(SELECT customer_code AS C, customer AS D FROM dim_customer
WHERE market = 'India')

SELECT TBL2.C AS customer_code, TBL2.D AS customer,
       ROUND (TBL1.B, 4) AS average_discount_percentage
FROM TBL1 JOIN TBL2
ON TBL1.A = TBL2.C
ORDER BY average_discount_percentage DESC
LIMIT 5 ;
```

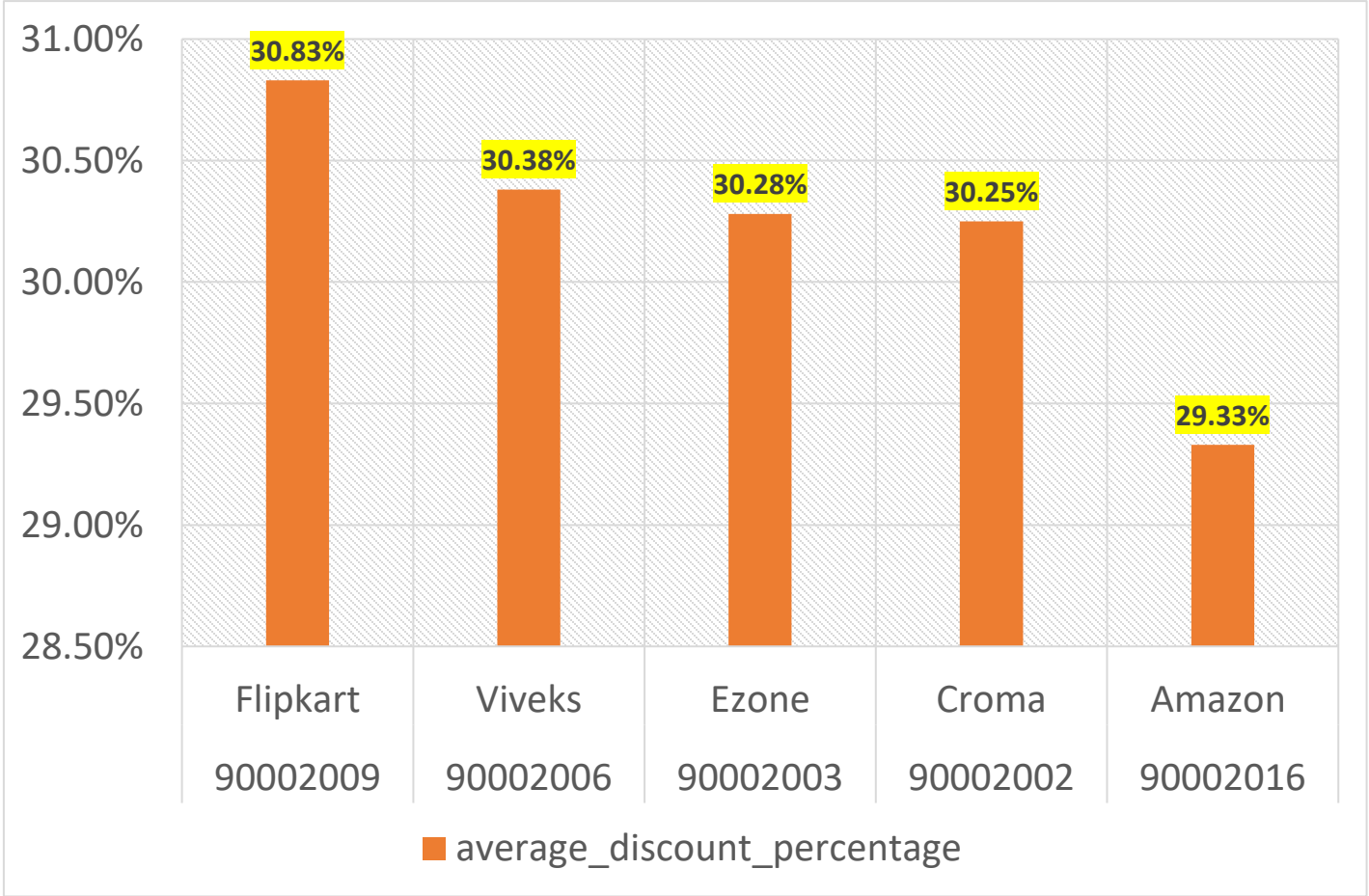
customer_code	customer	average_discount_percentage
90002009	Flipkart	30.83%
90002006	Viveks	30.38%
90002003	Ezone	30.28%
90002002	Croma	30.25%
90002016	Amazon	29.33%

Visualization | Insights

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.**



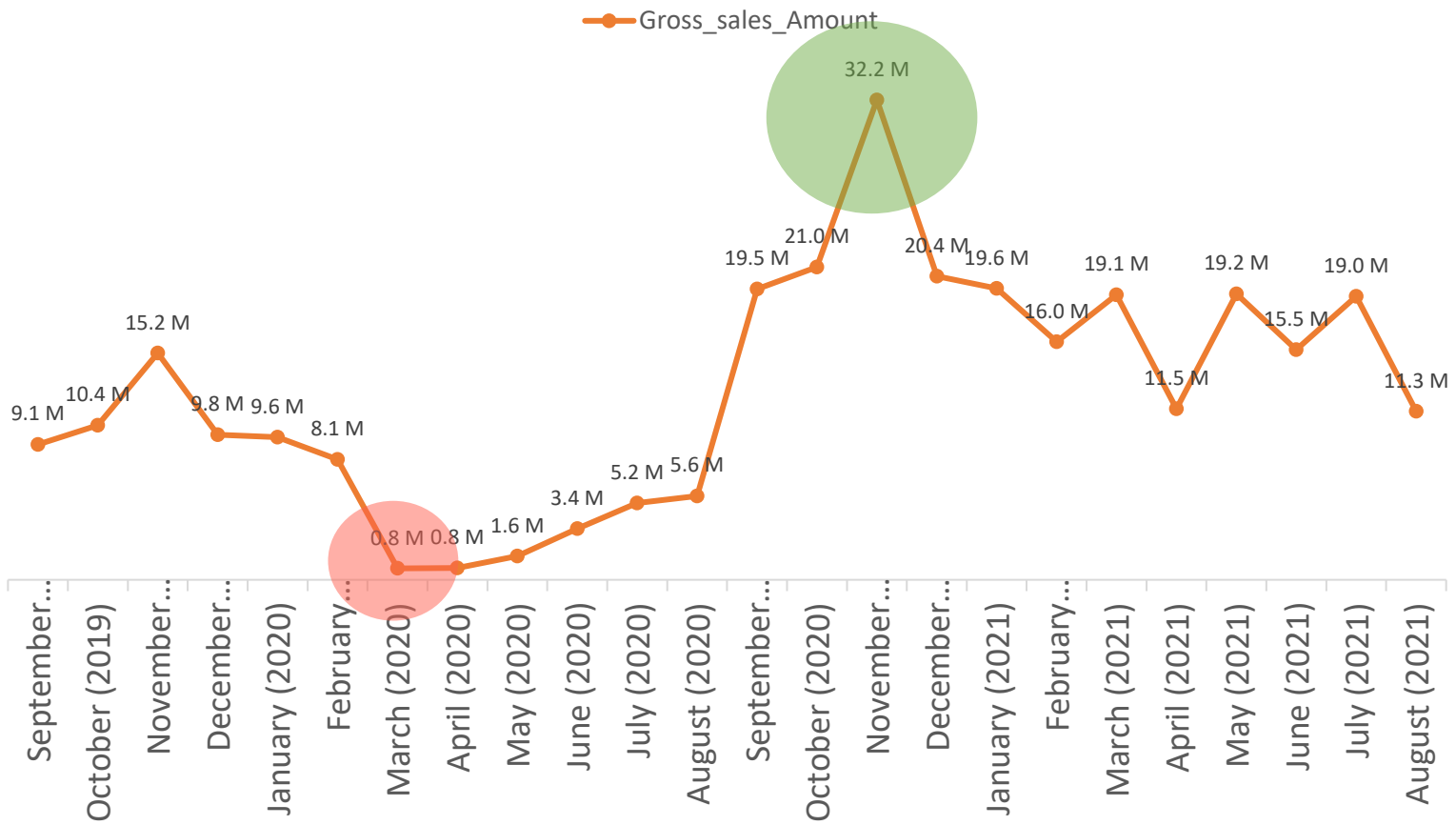
❖ Request No. 7

Get the complete report of the Gross sales amount for the customer “Atliq Exclusive” for each month.

```sql
SELECT CONCAT(MONTHNAME(FS.date),
       ' (', YEAR(FS.date), ')') AS 'Month', FS.fiscal_year,
       ROUND(SUM(G.gross_price*FS.sold_quantity), 2)
       AS Gross_sales_Amount
  FROM fact_sales_monthly FS
  JOIN dim_customer C ON FS.customer_code = C.customer_code
  JOIN fact_gross_price G ON FS.product_code = G.product_code
  WHERE C.customer = 'Atliq Exclusive'
  GROUP BY  Month, FS.fiscal_year
  ORDER BY FS.fiscal_year ;

```

Visualization | Insights

Month	fiscal_year	Gross_sales_Amount
September (2019)	2020	9.1 M
October (2019)	2020	10.4 M
November (2019)	2020	15.2 M
December (2019)	2020	9.8 M
January (2020)	2020	9.6 M
February (2020)	2020	8.1 M
March (2020)	2020	0.8 M
April (2020)	2020	0.8 M
May (2020)	2020	1.6 M
June (2020)	2020	3.4 M
July (2020)	2020	5.2 M
August (2020)	2020	5.6 M
September (2020)	2021	19.5 M
October (2020)	2021	21.0 M
November (2020)	2021	32.2 M
December (2020)	2021	20.4 M
January (2021)	2021	19.6 M
February (2021)	2021	16.0 M
March (2021)	2021	19.1 M
April (2021)	2021	11.5 M
May (2021)	2021	19.2 M
June (2021)	2021	15.5 M
July (2021)	2021	19.0 M
August (2021)	2021	11.3 M



For Atliq Exclusive, **November 2020** marked the **highest sales,** and **March 2020** marked the lowest gross sales. It's very evident that the **lower sales between March and August** are because of **COVID-19.** However, it's a very good sign that **the sales increased quickly after August** and reached the highest level since the last two years in November.

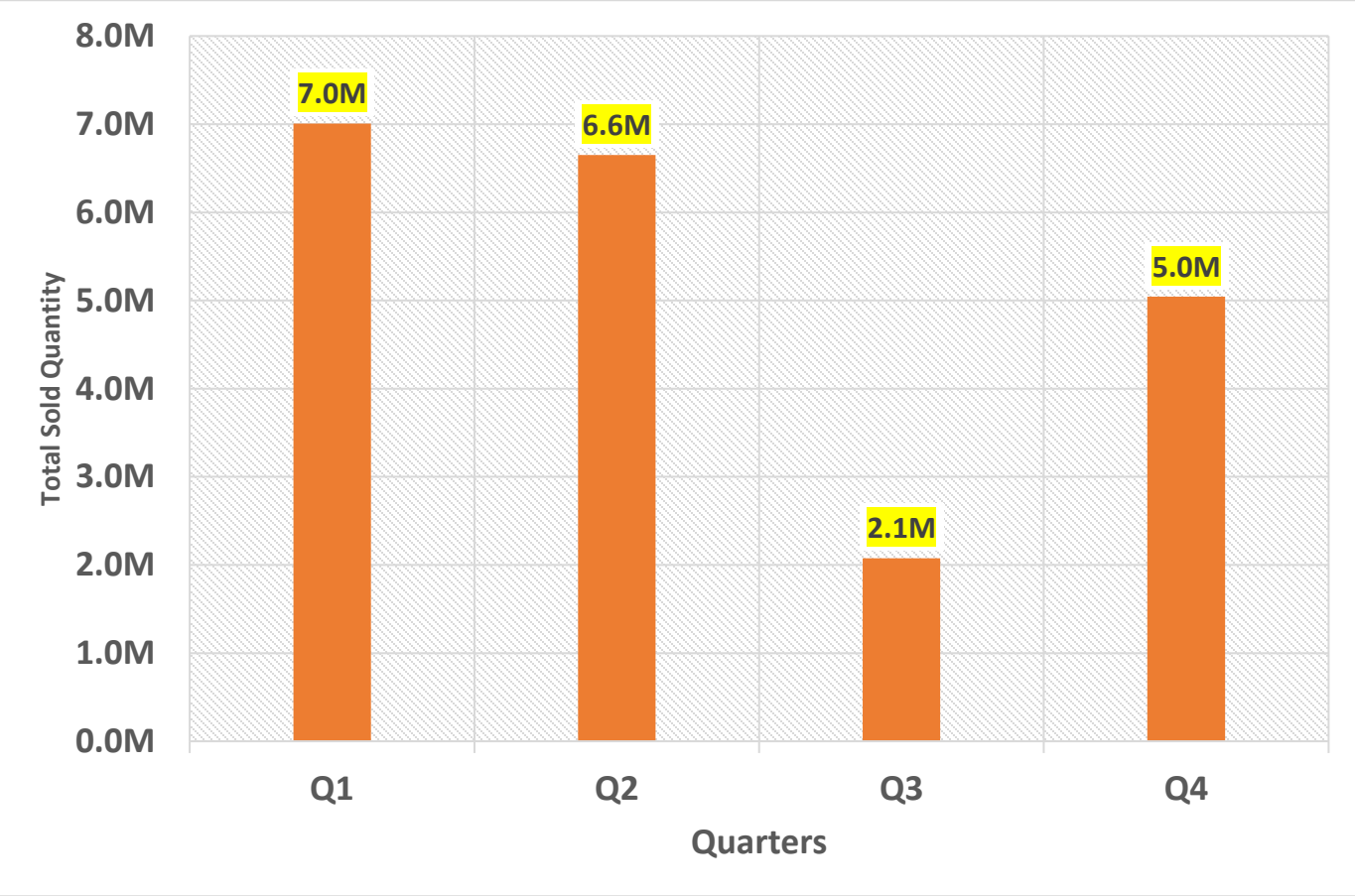
❖ Request No. 8

In which quarter of 2020, got the maximum total_sold_quantity?

```sql
SELECT
CASE
WHEN date BETWEEN '2019-09-01' AND '2019-11-01' then "Q1"
WHEN date BETWEEN '2019-12-01' AND '2020-02-01' then "Q2"
WHEN date BETWEEN '2020-03-01' AND '2020-05-01' then "Q3"
WHEN date BETWEEN '2020-06-01' AND '2020-08-01' then "Q4"
END AS Quarters,
SUM(sold_quantity) AS total_sold_quantity
FROM fact_sales_monthly
WHERE fiscal_year = 2020
GROUP BY Quarters
ORDER BY total_sold_quantity DESC
```

Quarters	total_sold_quantity
Q1	7.0M
Q2	6.6M
Q3	2.1M
Q4	5.0M

Visualization | Insights



Quarter 1 has the **maximum** total sold quantity

This again complements the previous insight. That is the effect of COVID-19 on our sales. **The sold quantity decreased to 2.1 million in quarter 3 of FY 2020, which was actually March, April, and May when COVID-19 was at its peak.**

But we started recovering very early despite the continuance of the pandemic. This **early recovery during quarter 4 is probably because of the increased need for hardware like desktops and notebooks as majority of the students began or continued to do their coursework online during this time,** and there was a huge demand for computer accessories during this period.

Request No. 9

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

```sql
WITH Output AS
(
SELECT C.channel,
       ROUND(SUM(G.gross_price*FS.sold_quantity/1000000), 2)
       AS Gross_sales_mln
FROM fact_sales_monthly FS
JOIN dim_customer C ON FS.customer_code = C.customer_code
JOIN fact_gross_price G ON FS.product_code = G.product_code
WHERE FS.fiscal_year = 2021
GROUP BY channel
)
SELECT channel, CONCAT(Gross_sales_mln,' M') AS Gross_sales_mln ,
CONCAT(ROUND(Gross_sales_mln*100/total , 2), ' %') AS percentage
FROM
(
(SELECT SUM(Gross_sales_mln) AS total FROM Output) A,
(SELECT * FROM Output) B
)
ORDER BY percentage DESC
```

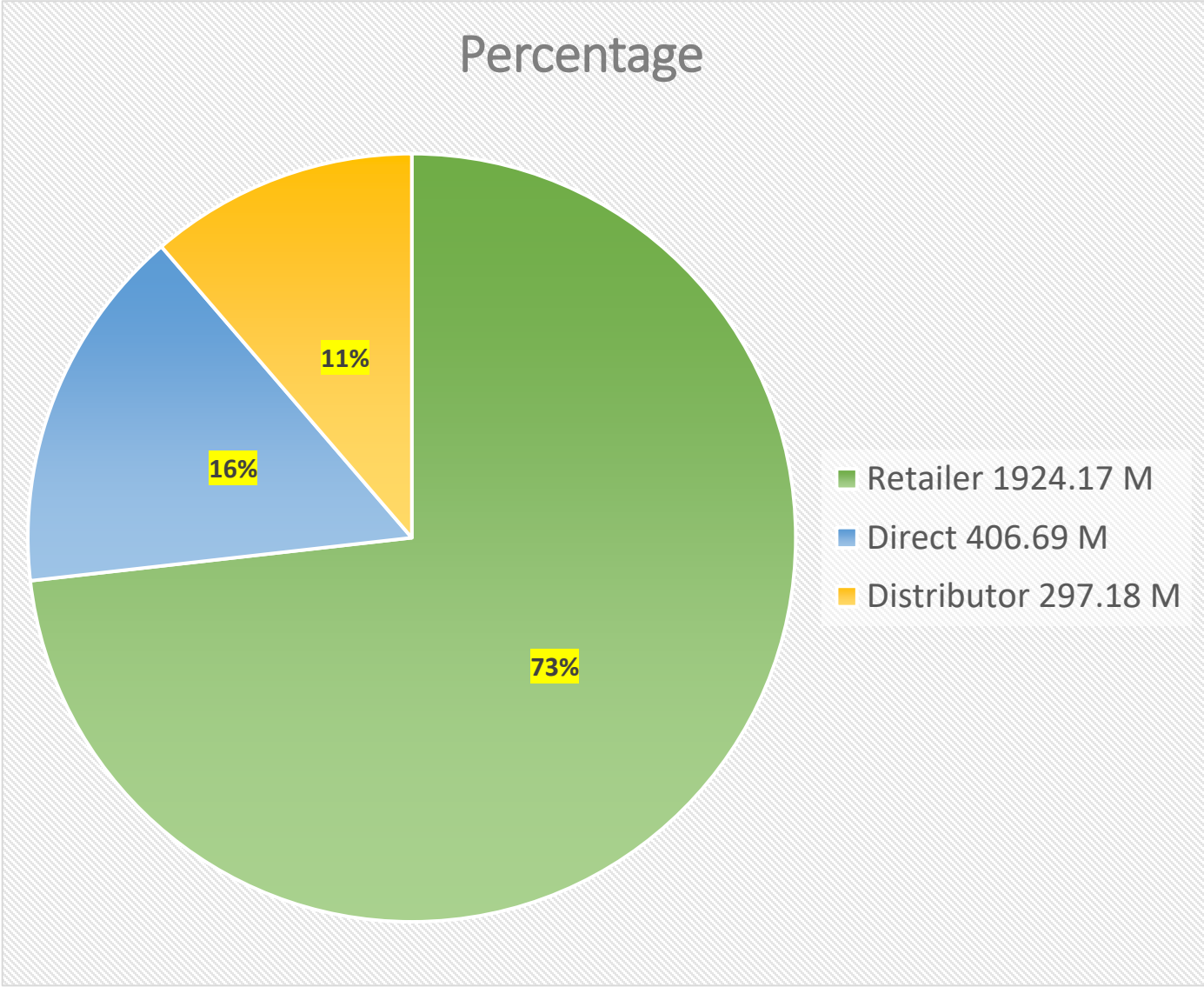
channel	Gross_sales_mln	percentage
Retailer	1924.17 M	73.22%
Direct	406.69 M	15.48%
Distributor	297.18 M	11.31%

Visualization | Insights

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%.**



Request No. 10

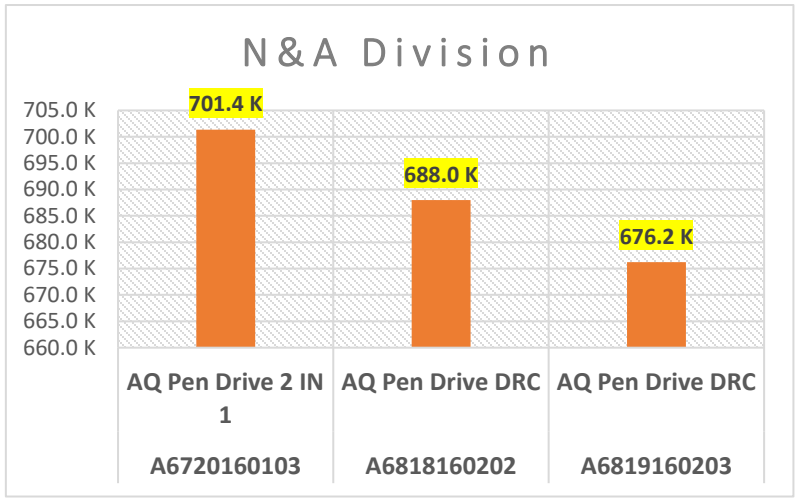
Get the Top 3 products in each division that have a high total_sold_quantity in the fiscal_year 2021 ?

```sql
with cte1 as
(Select p.division, s.product_code,p.product,
sum(sold_quantity) as total_sold_quantity
from dim_product p
join fact_sales_monthly s
using(product_code)
where s.fiscal_year=2021
group by p.division, s.product_code,p.product),

cte2 as
(Select *,
dense_rank() over (partition by division order by total_sold_quantity desc)
as Rank_Order from cte1)

Select * from cte2 where Rank_Order <= 3;
```

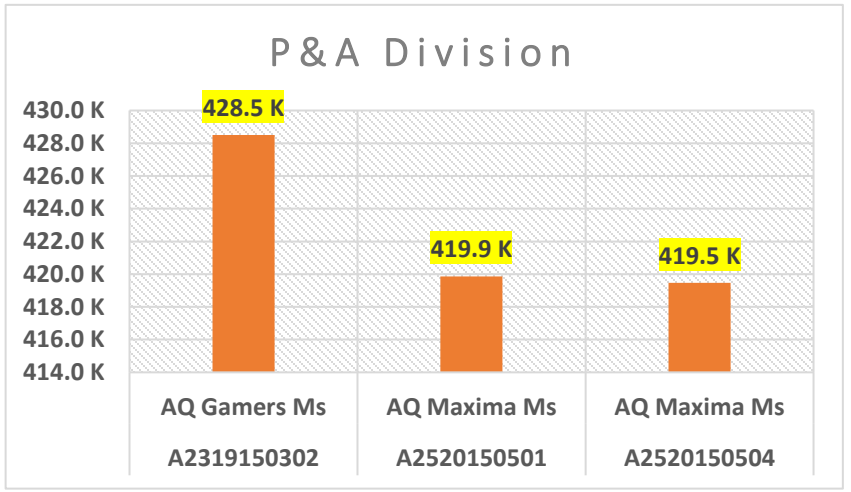
Visualization | Insights

division	product_code	product	total_sold_quantity	Rank_Order
N & S	A6720160103	AQ Pen Drive 2 IN 1	701.4 K	1
N & S	A6818160202	AQ Pen Drive DRC	688.0 K	2
N & S	A6819160203	AQ Pen Drive DRC	676.2 K	3
P & A	A2319150302	AQ Gamers Ms	428.5 K	1
P & A	A2520150501	AQ Maxima Ms	419.9 K	2
P & A	A2520150504	AQ Maxima Ms	419.5 K	3
PC	A4218110202	AQ Digit	17.4 K	1
PC	A4319110306	AQ Velocity	17.3 K	2
PC	A4218110208	AQ Digit	17.3 K	3

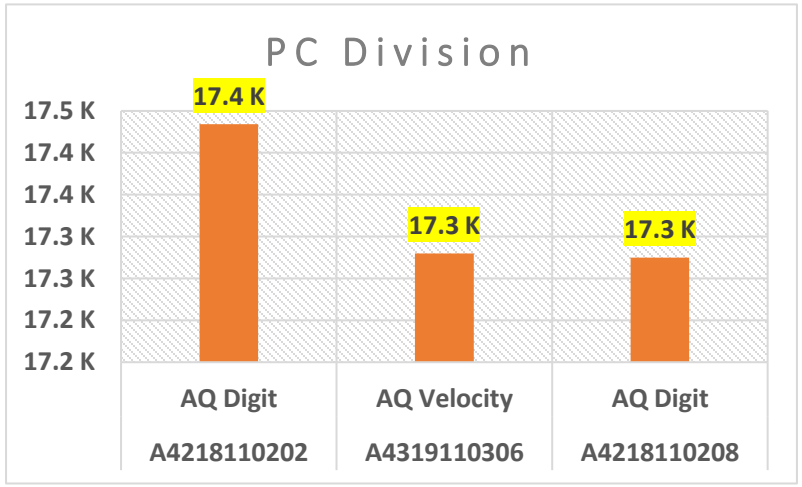
Visualization | Insights



The top 3 selling products in N&S were **pen drives,** which were around **7 lakh in quantity.**



The top 3 selling products in P&A were **mouse,** which were around **4 lakh in quantity.**



The top 3 selling products in PC were personal **laptops,** which were around **17000 in quantity.**


Thank you!