Atliq Hardware

#4
Codebasics Challenge

SQL challenge

Consumer Goods Ad-Hoc Insights

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Introduction

Atliq hardware (imaginary company) is one of the leading computer hardware producers in India and well expanded in other countries too.

Problem

Management do not get enough insights to make quick and smart data-informed decisions

Solution

Expand their data analytics team by adding several junior data analysts

Task

10 ad-hoc request for which the business needs insights.
Write SQL queries to answer these requests.
Presentation to Top Level management

Database Schema

dim_customer:
contains customer-related data

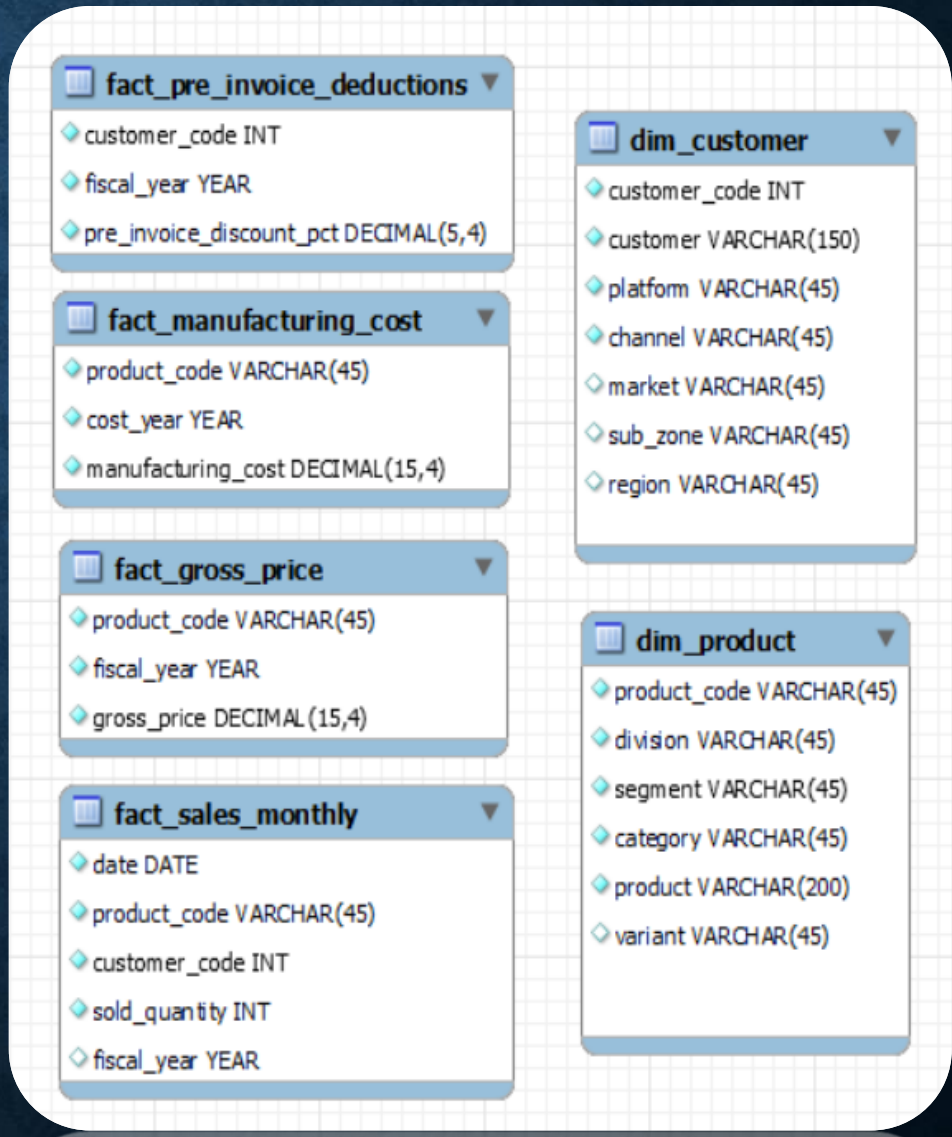
dim_product:
contains product-related data

fact_gross_price:
contains gross price information for each product

fact_manufacturing_cost:
contains the cost incurred in the production of each product

fact_pre_invoice_deductions:
contains pre-invoice deductions information for each product

fact_sales_monthly:
contains monthly sales data for each product.



Request 1

Output

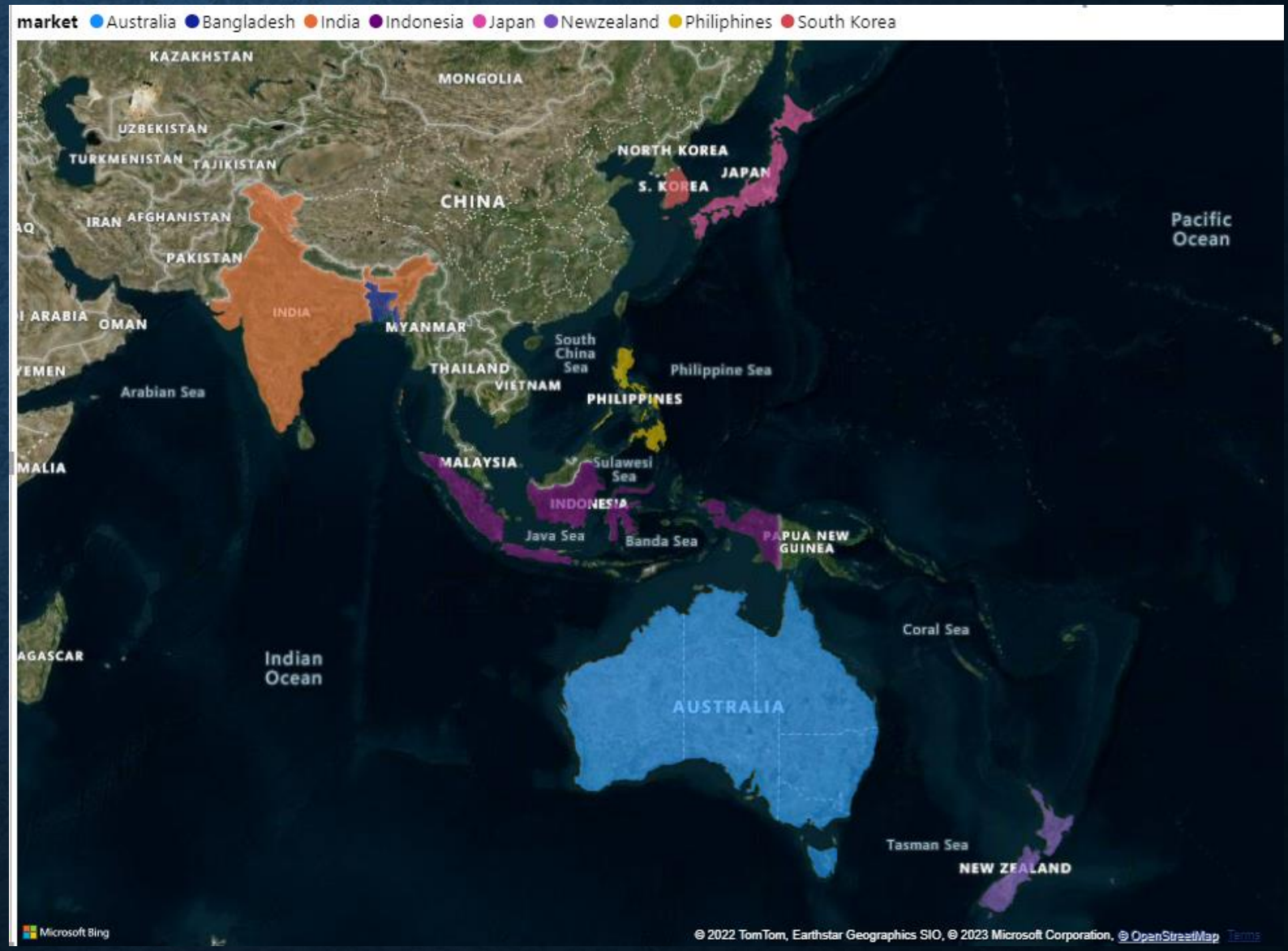
Provide the list of markets in which customer "Atliq Exclusive" operates its business in the APAC region.

Query

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

Atliq Exclusive has established a presence in 8 of the region's biggest markets, out of a total of 27 markets.

Insights



Request 2

Output

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

Output

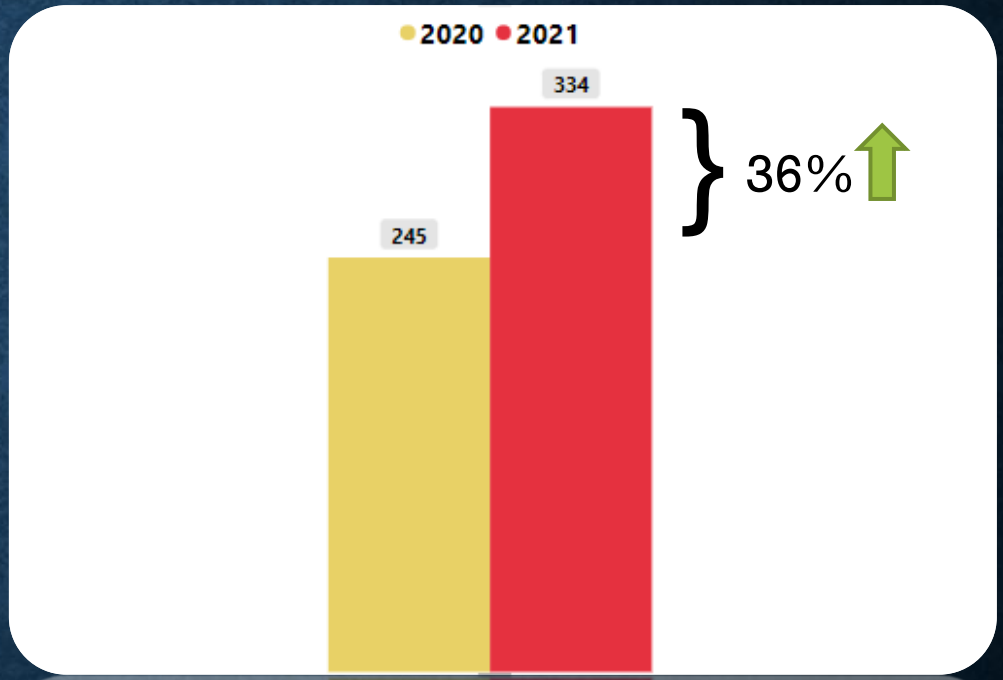
unique_products_2020	unique_products_2021	percentage_chg
245	334	36.33%

Query

```sql
WITH
pdt_2020 AS
    (SELECT COUNT(DISTINCT(product_code))
      AS unique_products_2020
    FROM fact_sales_monthly
    WHERE fiscal_year=2020),
pdt_2021 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,
CONCAT(ROUND(
((unique_products_2021-unique_products_2020)/unique_products_2020)*100,2),'%')
  AS percentage_chg
FROM pdt_2020 JOIN pdt_2021;
```

Insights



In comparison to FY 2020, Atliq developed 89 unique items in FY 2021, a 36% increase, highlighting the company's strong commitment to innovation and launching new goods.

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

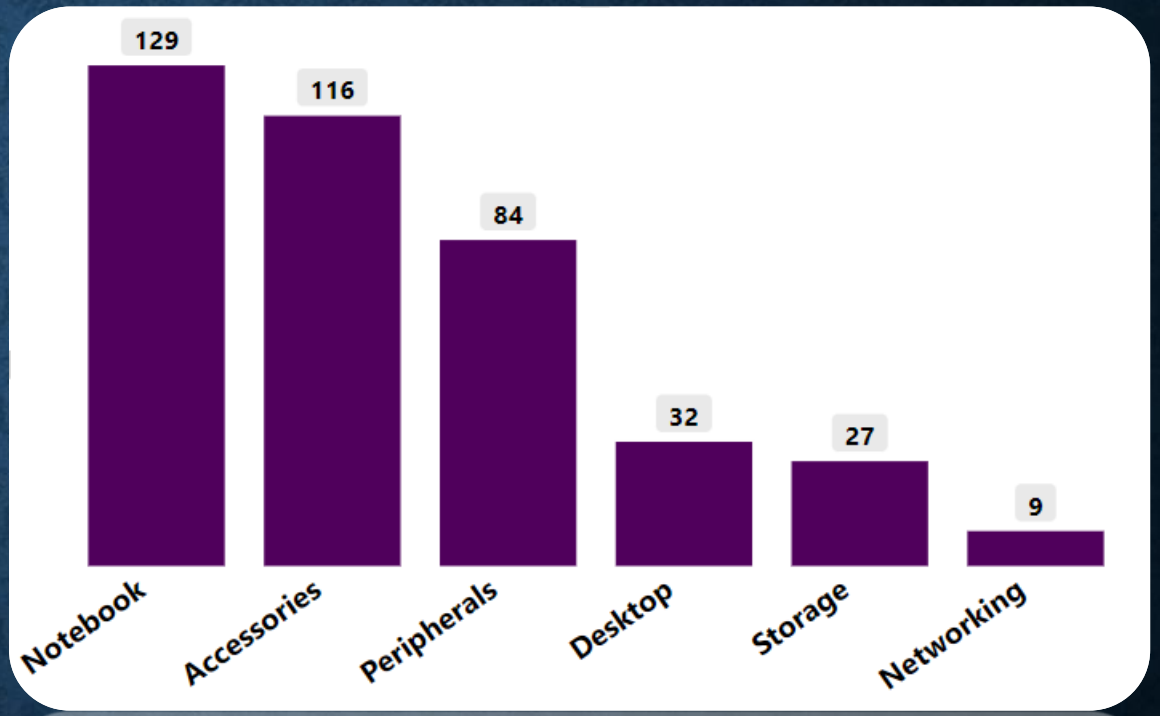
Output

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

Query

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

Insights



The Notebook segment of Atliq's six market segments had the most distinctive products, while Networking, Desktop, and Storage had the fewest. Atliq should put more of a focus on creating distinctive products in these segments to expand its product line.

Request 4

Output

CODE BASICS

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

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

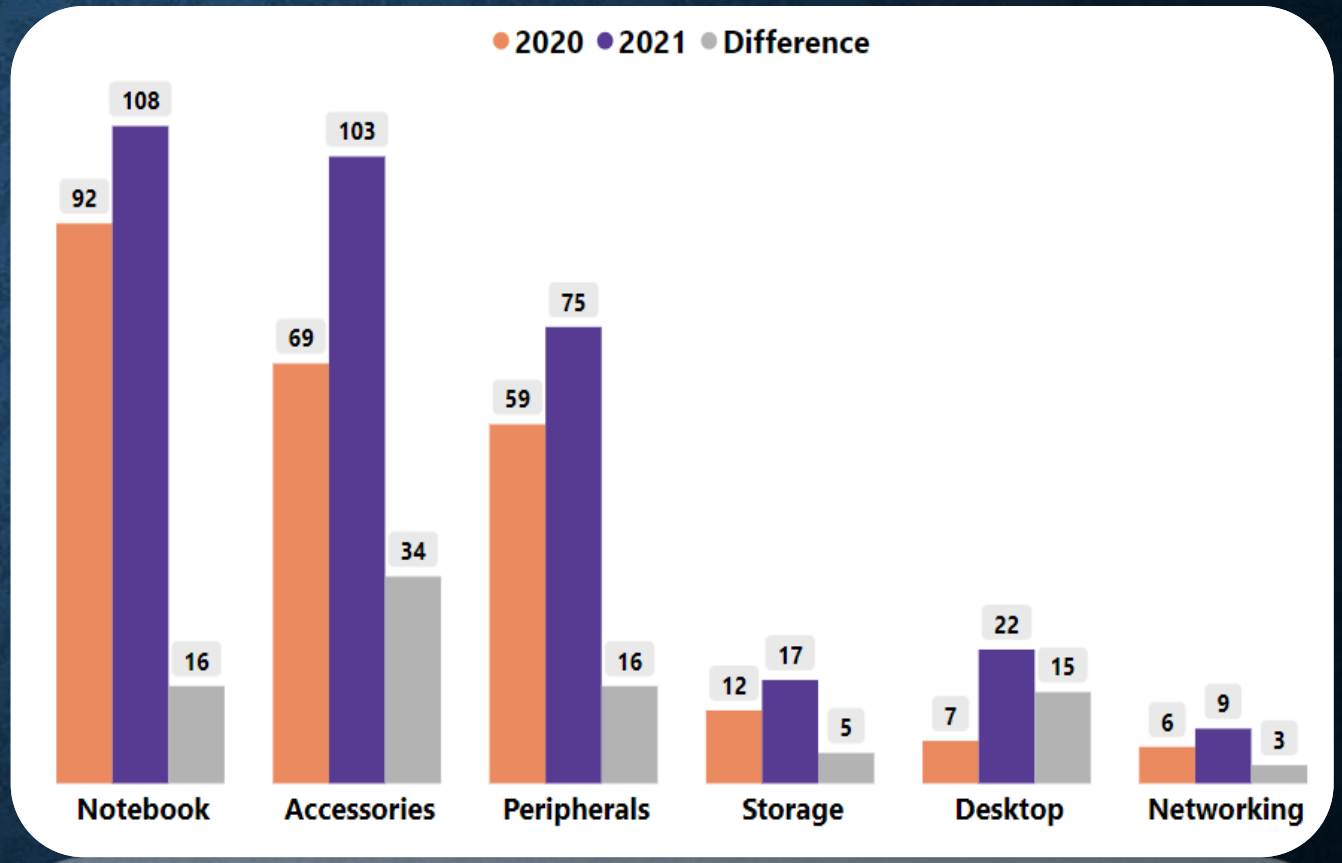
Query

```
WITH
cnt_2020 AS (
    SELECT segment,
    COUNT(DISTINCT(f.product_code)) AS product_count_2020
    FROM fact_sales_monthly AS f JOIN dim_product AS d
    ON f.product_code = d.product_code
    WHERE fiscal_year=2020
    GROUP BY segment),

cnt_2021 AS(
    SELECT segment,
    COUNT(DISTINCT(f.product_code))AS product_count_2021
    FROM fact_sales_monthly AS f JOIN dim_product AS d
    ON f.product_code = d.product_code
    WHERE fiscal_year=2021
    GROUP BY segment)

SELECT a.segment, product_count_2020, product_count_2021,
(product_count_2021-product_count_2020) AS difference
FROM cnt_2020 a JOIN cnt_2021 b
ON a.segment = b.segment;
```

Insights



With a difference of 34, the Accessories segment has had the largest increase in unique products, followed by Notebook and Peripherals.

Request 5

Output

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

The final output should contain these fields,

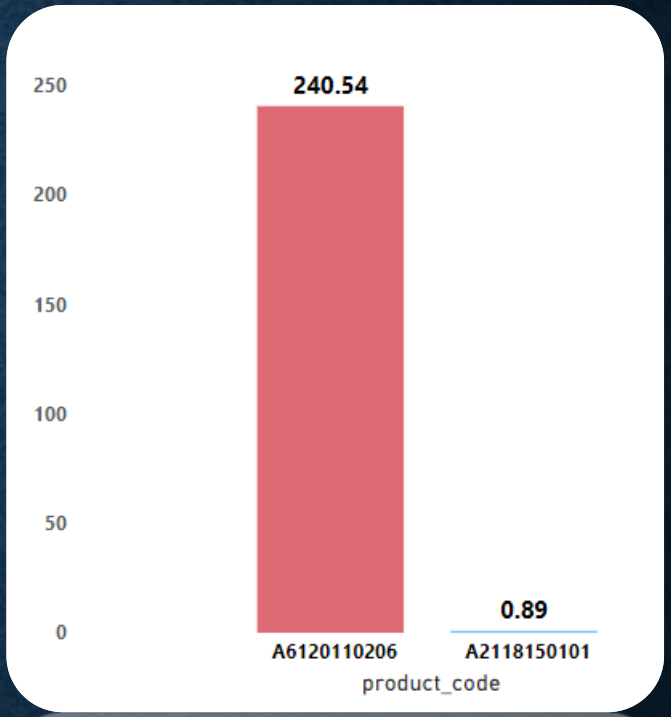
- product_code
- Product
- manufacturing_cost

product_code	product	manufacturing_cost
A6120110206	AQ HOME Allin1 Gen 2	240.5364
A2118150101	AQ Master wired x1 Ms	0.8920

Query

```
SELECT f.product_code, product, manufacturing_cost
FROM fact_manufacturing_cost AS f
JOIN dim_product AS d
ON f.product_code = d.product_code
WHERE manufacturing_cost=(SELECT MAX(manufacturing_cost)
FROM fact_manufacturing_cost)
UNION
SELECT f.product_code, product, manufacturing_cost
FROM fact_manufacturing_cost AS f
JOIN dim_product AS d
ON f.product_code = d.product_code
WHERE manufacturing_cost=(SELECT MIN(manufacturing_cost)
FROM fact_manufacturing_cost);
```

Insights



Highest = AQ HOME Allin 1 Gen 2

Lowest = AQ Master wired x1 Ms

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

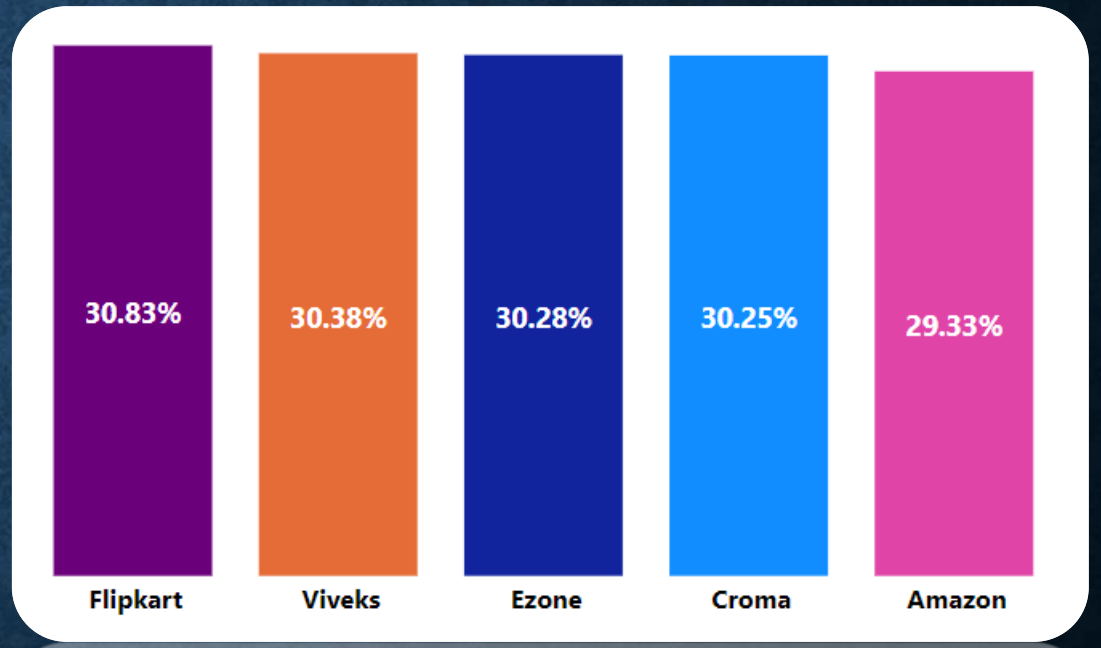
Output

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

Query

```sql
SELECT c.customer_code, c.customer,
p.pre_invoice_discount_pct AS average_discount_percentage
FROM dim_customer as c INNER join fact_pre_invoice_deductions AS p
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 c.market='India' AND p.fiscal_year = 2021
ORDER BY p.pre_invoice_discount_pct DESC
LIMIT 5;
```

Insights



Flipkart had the greatest average pre-invoice discount percentage among Indian merchants in FY 2021 (30.83%), followed by Viveks, Ezone, Croma, and Amazon.

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
- Gross sales Amount

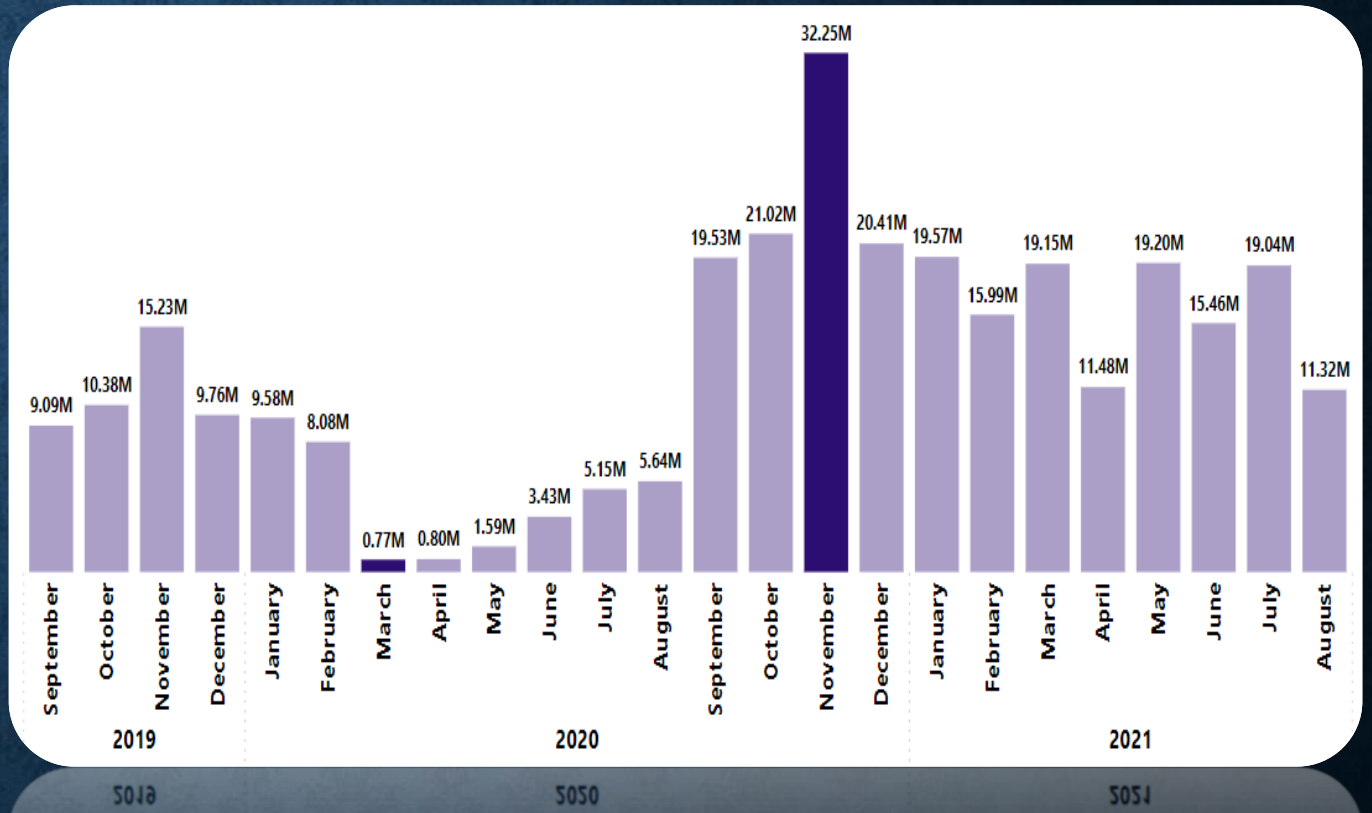
Output

month	year	gross_sales_amount
9	2019	9092670.85
10	2019	10378637.79
11	2019	15231895.21
12	2019	9755795.21
1	2020	9584951.90
2	2020	8083995.87
3	2020	766976.28
4	2020	800072.08
5	2020	1586963.98
6	2020	3429736.75
7	2020	5151815.71
8	2020	5638281.79
9	2020	19530271.90
10	2020	21016218.96
11	2020	32247290.68
12	2020	20409063.68
1	2021	19570702.79
2	2021	15986605.01
3	2021	19149625.28
4	2021	11483530.74
5	2021	19204310.02
6	2021	15457580.57
7	2021	19044969.71
8	2021	11324548.87

Query

```
SELECT MONTH(s.date) AS month,
YEAR(s.date) AS year,
SUM(ROUND((s.sold_quantity*g.gross_price),2)) AS gross_sales_amount
FROM fact_sales_monthly AS s INNER JOIN fact_gross_price AS g
ON s.product_code=g.product_code
INNER JOIN dim_customer AS c
ON s.customer_code=c.customer_code
WHERE c.customer = 'atliq exclusive'
GROUP BY month, year
ORDER BY year;
```

Insights



The biggest gross sales for Atliq Exclusive were 32.25 million in November 2020, while the lowest were 0.77 million in March 2020. Due to COVID-19, sales fell from March to August, but beyond that point, they started to rise, reaching their greatest gross sales level in November.

Request 8

Output

In which quarter of 2020, got the maximum total_sold_quantity?

The final output contains these fields sorted by the total_sold_quantity

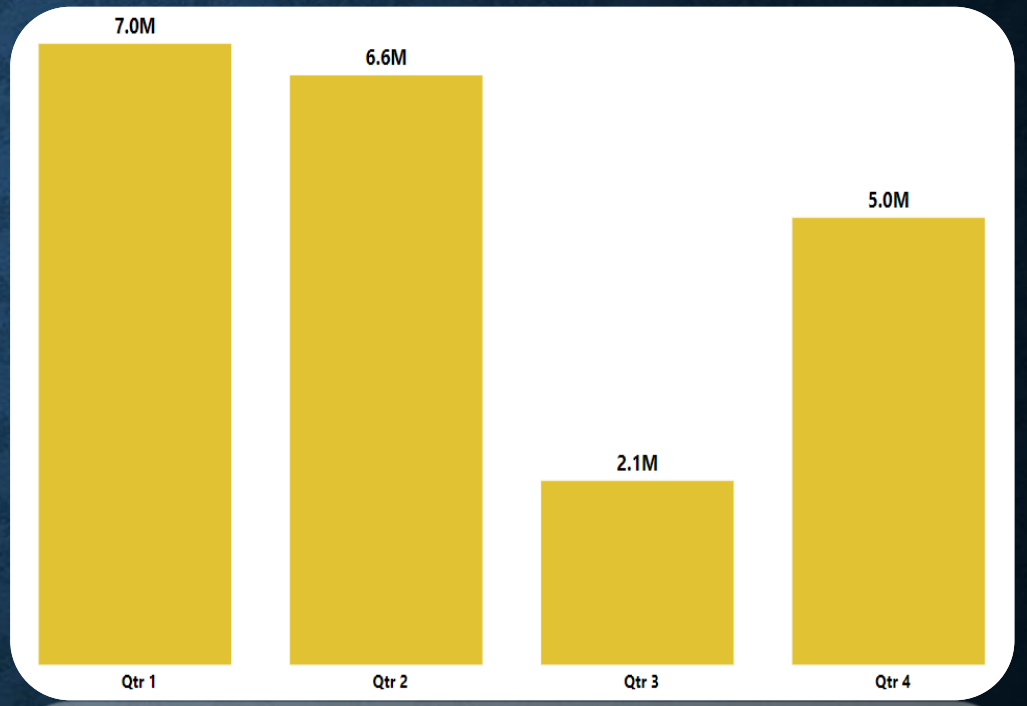
Quarter,
total_sold_quantity

Quarter	total_sold_quantity
Qtr 1	7.01 Mn
Qtr 2	6.65 Mn
Qtr 4	5.04 Mn
Qtr 3	2.08 Mn

Query

```sql
SELECT
CASE
    WHEN MONTH(date) IN (9, 10, 11) THEN 'Qtr 1'
    WHEN MONTH(date) IN (12, 1, 2) THEN 'Qtr 2'
    WHEN MONTH(date) IN (3, 4, 5) THEN 'Qtr 3'
    WHEN MONTH(date) IN (6, 7, 8) THEN 'Qtr 4'
    END AS Quarter,
CONCAT(ROUND(SUM(sold_quantity)/1000000,2)," Mn")
        AS total_sold_quantity
FROM fact_sales_monthly
WHERE fiscal_year = 2020
GROUP BY Quarter
ORDER BY total_sold_quantity DESC;
```

Insights



In 2020, the first quarter saw the highest quantity sold (7.01M), while the third quarter saw the lowest (2.08M), mostly as a result of COVID-19. Sales started to decline in the third quarter (March to May), but they recovered in the fourth.

Request 9

Output

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

channel	gross_sales_mln	percent
Retailer	1924.17	73.216922
Direct	406.69	15.475031
Distributor	297.18	11.308047

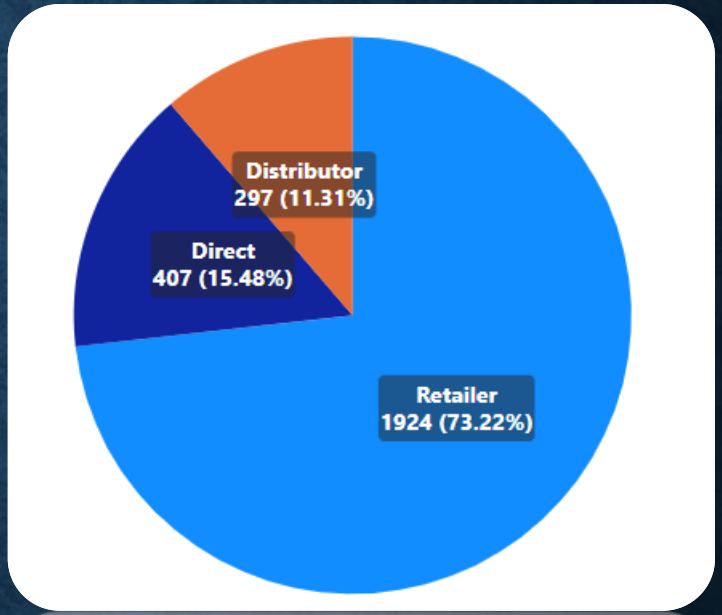
The final output contains these fields,

- channel
- gross_sales_mln
- percentage

Query

```sql
WITH gross_sales_cte AS
(
    SELECT c.channel,
    ROUND(SUM((s.sold_quantity * g.gross_price)/1000000),2)
        AS gross_sales_mln
    FROM fact_sales_monthly AS s
    INNER JOIN fact_gross_price AS g
    ON  s.product_code = g.product_code
    INNER JOIN dim_customer AS c
    ON s.customer_code = c.customer_code
    WHERE s.fiscal_year = 2021
    GROUP BY c.channel
    ORDER BY gross_sales_mln DESC
)
SELECT *,
gross_sales_mln*100/SUM(gross_sales_mln) OVER() AS percent
FROM gross_sales_cte;
```

Insights



Retailers were the main sales channel in FY 2021, accounting for 73.22% of all sales, while distributor and direct sales accounted for a much smaller portion.

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

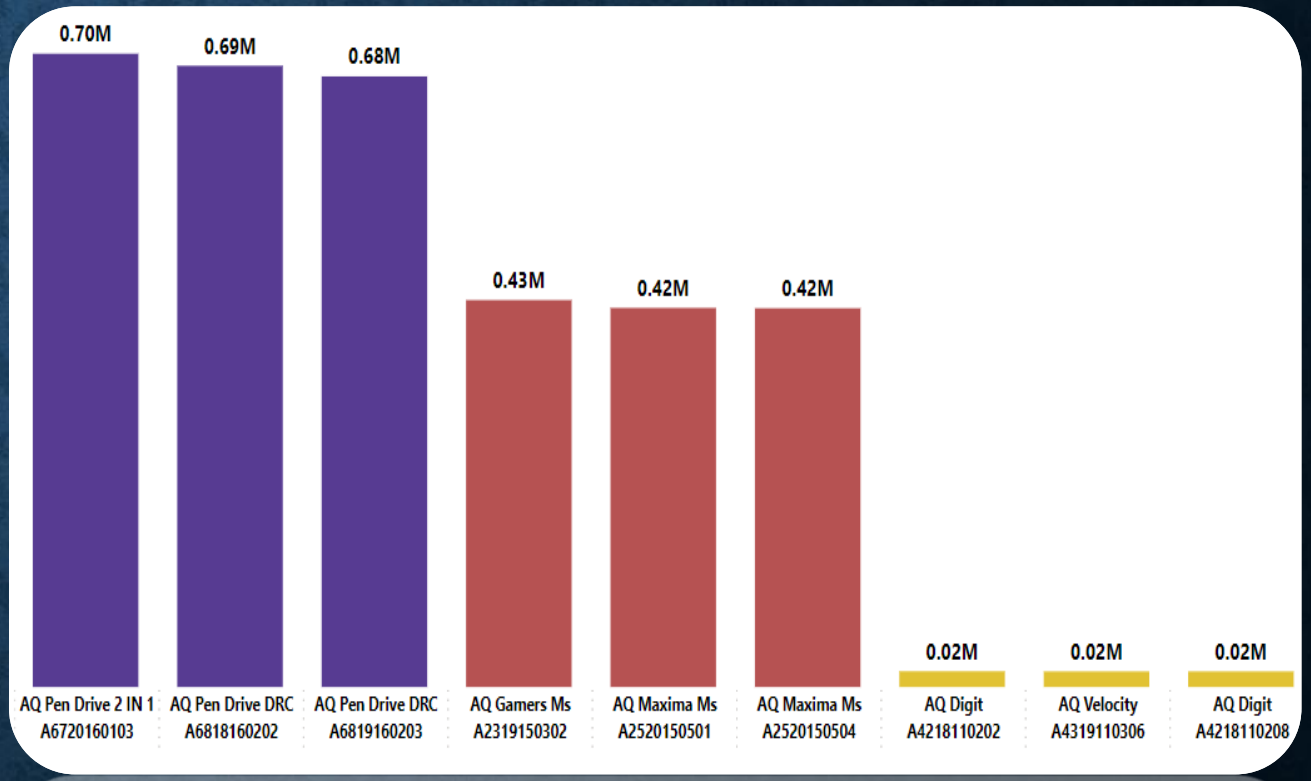
Output

division	product_code	product	total_sold_qty	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

Query

```sql
WITH
division_sales_cte AS
    (
    SELECT p.division, s.product_code,p.product, SUM(s.sold_quantity)
       AS 'total_sold_qty',
    row_number() OVER (PARTITION BY p.division
       ORDER BY sum(s.sold_quantity) DESC) AS rank_order
    FROM fact_sales_monthly AS s
    INNER JOIN dim_product AS p
    ON s.product_code = p.product_code
    WHERE s.fiscal_year = 2021
    GROUP BY p.division, s.product_code, p.product
    )
SELECT division, product_code, product, total_sold_qty, rank_order
FROM division_sales_cte
WHERE rank_order <= 3;
```

Insights



According to total quantity sold, the best-selling items in the N&S, P&A, and PC divisions include AQ Pen Drive 2 IN 1, AQ Gamers Ms, and AQ Digit. Sales for the PC division, however, are less than those of N&S and P&A.

Thank you