AtliQ's Business Statement

AtliQ hardware is among the first indigenous manufacturer of computer peripherals. As the business grew their data storage becomes a problem as they were using EXCEL to store their entire data. Company decided to switch to MySQL which is free and robust.

Business Model:

AtliQ Hardware sell Computer hardware to different customers (retail store like croma, bestbuy, etc. & e-commerce platforms), these stores will sell these products to consumers. AtliQ Hardware deals in two types of platforms Brick & Mortar (croma, bestbuy) and E-commerce (flipkart, amazon). They sell their product through three different channels i.e. Retailer (croma, flipkart), Direct (atliq exclusive) and distributor.

Profit & Loss Statements:

Pre-Invoice Deductions: yearly discount agreements made at the beginning of each financial year.

Net Invoice Sale: Price after pre-invoice deductions i.e. Gross Price – Pre-invoice deductions.

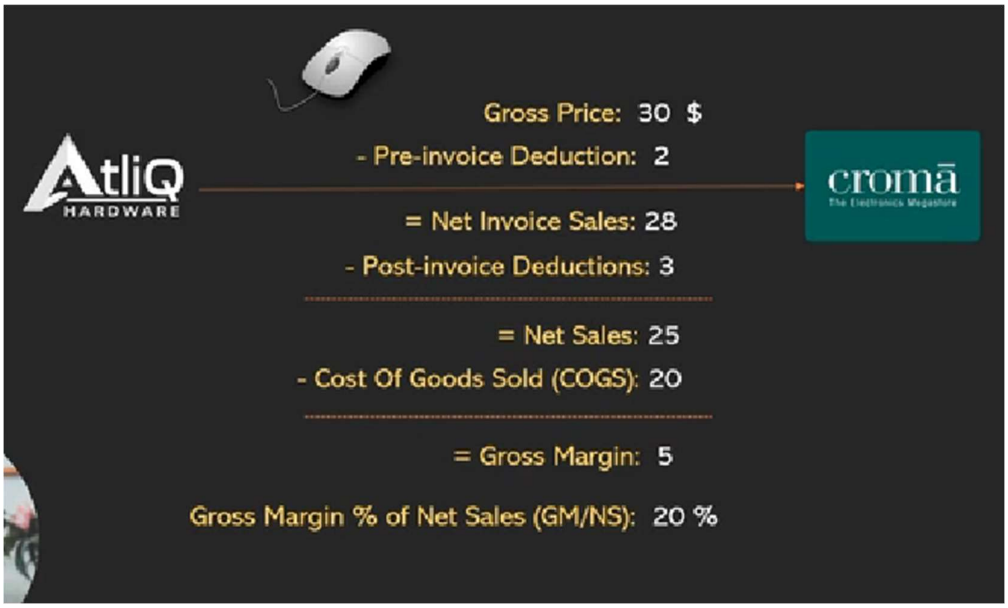
Post-Invoice Deductions: these are the discounts provided after sale which can include promotional offers, placement fees, performance rebate, etc.

Net Sales: it is basically the revenue earned by AtliQ by selling a product i.e. Net Invoice Sale – Post-invoice deduction.

Cost of Goods Sold (COGS): it is the amount spent in making a product which may include manufacturing cost, freight cost, other cost, etc.

Gross Margn: it is the amount after deducting COGS from Net Sales i.e. Net Sales – COGS.

Gross Margin % of Net Sales: GM/NS



Learnings:

- Joins
- Sub-Queries
- Common Table Expressions (CTEs)
- Aggregate functions
- User Defined Functions
- Stored Procedure
- Views
- Temporary Tables
- Window Functions
- Entity Relationship Diagrams (ERD)

Problem Statement:

As part of data analytics team, we need create reports based on demands of business manager.

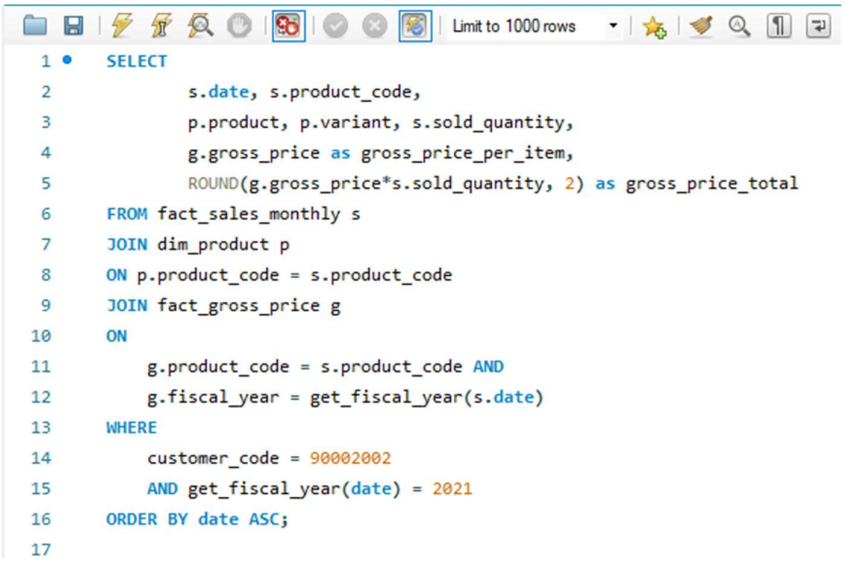
I. Croma India Product wise Sales Report:

To generate a report of individual product sales (aggregated on a monthly basis at the product code level) for Croma India for FY 2021 in order to track product sales and run further product analytics.

Report should include the following:

1. Month
2. Product name
3. Variant
4. Sold quantity
5. Gross price per item
6. Gross price total

Query:



Result Grid:

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

date	product_code	product	variant	sold_quantity	gross_price_per_item	gross_price_total
2020-09-01	A0118150101	AQ Dracula HDD – 3.5 Inch S...	Standard	202	19.0573	3849.57
2020-09-01	A0118150102	AQ Dracula HDD – 3.5 Inch S...	Plus	162	21.4565	3475.95
2020-09-01	A0118150103	AQ Dracula HDD – 3.5 Inch S...	Premium	193	21.7795	4203.44
2020-09-01	A0118150104	AQ Dracula HDD – 3.5 Inch S...	Premium Plus	146	22.9729	3354.04
2020-09-01	A0219150201	AQ WereWolf NAS Internal H...	Standard	149	23.6987	3531.11
2020-09-01	A0219150202	AQ WereWolf NAS Internal H...	Plus	107	24.7312	2646.24
2020-09-01	A0220150203	AQ WereWolf NAS Internal H...	Premium	123	23.6154	2904.69
2020-09-01	A0320150301	AQ Zion Saga	Standard	146	23.7223	3463.46
2020-09-01	A0321150302	AQ Zion Saga	Plus	236	27.1027	6396.24
2020-09-01	A0321150303	AQ Zion Saga	Premium	137	28.0059	3836.81
2020-09-01	A0418150103	AQ Mforce Gen X	Standard 3	23	19.5235	449.04
2020-09-01	A0418150104	AQ Mforce Gen X	Plus 1	82	19.9239	1633.76
2020-09-01	A0418150105	AQ Mforce Gen X	Plus 2	86	20.0766	1726.59

II. Gross Monthly total sales report for Croma:

Prepare an aggregate monthly gross sales report for Croma India customer in order to track the monthly sales the particular customer is generating for AtliQ and manage their relationship accordingly.

Report should include the following:

1. Month
2. Total gross sales amount to Croma India in this month.

Query:

Limit to 1000 rows

```
1  SELECT
2      s.date,
3      ROUND(SUM(g.gross_price*s.sold_quantity),2) as gross_price_total
4  FROM fact_sales_monthly s
5  JOIN fact_gross_price g
6  ON
7      g.product_code = s.product_code AND
8      g.fiscal_year = get_fiscal_year(s.date)
9  WHERE customer_code = 90002002
10 GROUP BY s.date
11 ORDER BY s.date ASC;
```

Result Grid:

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

date	gross_price_total
2017-09-01	122407.56
2017-10-01	162687.57
2017-12-01	245673.80
2018-01-01	127574.74
2018-02-01	144799.52
2018-04-01	130643.90
2018-05-01	139165.10
2018-06-01	125735.38
2018-08-01	125409.88
2018-09-01	343337.17
2018-10-01	440562.08
2018-12-01	653944.75
2019-01-01	359025.02
2019-02-01	356607.17

III. Stored Procedure for Market Badge:

Create a stored procedure that can determine the market badge on the following logic.

If total sold quantity > 5 million that market is considered GOLD else it is SILVER.

Inputs will be

- Market
- Fiscal year

Output

- Market Badge

Query:

Name: get_market_badge

DDL:

```
CREATE DEFINER=`root`@`localhost` PROCEDURE `get_market_badge`(
    IN in_market VARCHAR(45),
    IN in_fiscal_year YEAR,
    OUT out_badge VARCHAR(45)
)
BEGIN
    DECLARE qty INT DEFAULT 0;

    #set default market to be INDIA
    IF in_market = "" THEN
        SET in_market = "india";
    END IF;
    # retreive total qty for a given market & fiscal year
    SELECT
    SUM(sold_quantity) INTO qty
    FROM fact_sales_monthly s
    JOIN dim_customer c
    ON s.customer_code = c.customer_code
    WHERE get_fiscal_year(s.date) = in_fiscal_year AND
          c.market = in_market
    GROUP BY c.market;

    #determine market badge
    IF qty > 5000000 THEN
        SET out_badge = "GOLD";
    ELSE
        SET out_badge = "SILVER";
    END IF;
END
```

IV. Net Sales Report

Generate a report for top markets, products, customers by net sales for a given financial year in order to track the company's financial performance and to take any appropriate actions to address any potential issues.

Report for Top Markets:

1. Rank
2. Market
3. Net sales (millions)

Query:

Name: get_top_n_markets_by_net_sales

DDL:

```
CREATE DEFINER=`root`@`localhost` PROCEDURE `get_top_n_markets_by_net_sales`(
    in_fiscal_year INT,
    in_top_n INT
)
BEGIN
    SELECT
        market,
        ROUND(SUM(net_sales)/1000000, 2) as net_sales_mln
    FROM net_sales
    WHERE fiscal_year = in_fiscal_year
    GROUP BY market
    ORDER BY net_sales_mln DESC
    LIMIT in_top_n;
END
```

Result Grid:

```
call gdb0041.get_top_n_markets_by_net_sales(2021, 5);
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

market	net_sales_mln
India	210.67
USA	132.05
South Korea	64.01
Canada	45.89
United Kingdom	44.73

Report for Top Products:

1. Rank
2. Product
3. Net sales (millions)

Query:

Name: get_top_n_products_by_net_sales

DDL:

```
1  CREATE DEFINER=`root`@`localhost` PROCEDURE `get_top_n_products_by_net_sales`(
2      in_fiscal_year INT,
3      in_top_n INT
4  )
5  BEGIN
6      SELECT
7              product,
8              ROUND(SUM(net_sales)/1000000, 2) as net_sales_mln
9          FROM net_sales
10         WHERE fiscal_year = in_fiscal_year
11         GROUP BY product
12         ORDER BY net_sales_mln DESC
13         LIMIT in_top_n;
14 END
```

Result Grid:

Limit to 1000 rows

```
1  call gdb0041.get_top_n_products_by_net_sales(2021, 5);
2
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

product	net_sales_mln
AQ BZ Allin1	33.75
AQ Qwerty	27.84
AQ Trigger	26.95
AQ Gen Y	23.58
AQ Maxima	22.32

Report for Top Customer:

1. Rank
2. Customer
3. Net sales (millions)

Query:

Name: get_top_n_customers_by_net_sales

DDL:

```
CREATE DEFINER=`root`@`localhost` PROCEDURE `get_top_n_customers_by_net_sales`(
    in_fiscal_year INT,
    in_top_n INT,
    in_market VARCHAR(45)
)
BEGIN
    SELECT
    c.customer,
    ROUND(SUM(net_sales)/1000000, 2) as net_sales_mln
FROM net_sales n
JOIN dim_customer c
    ON c.customer_code = n.customer_code
WHERE fiscal_year = in_fiscal_year AND n.market = in_market
GROUP BY c.customer
ORDER BY net_sales_mln DESC
LIMIT in_top_n;
END
```

Result Grid:

```
call gdb0041.get_top_n_customers_by_net_sales(2021, 5, 'india');
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer	net_sales_mln
Amazon	30.00
Atliq Exclusive	23.98
Flipkart	12.96
Electricalsocity	12.31
Propel	11.86

V. Net Sales Global Market Share % Bar Chart

Create a bar chart report for FY 2021 for top 10 markets by %age net sales.

Query:

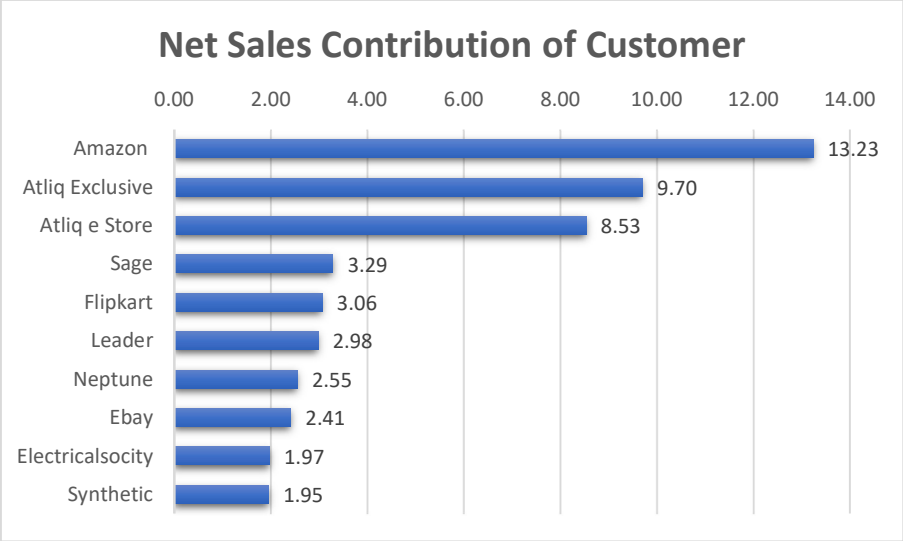
```
WITH cte1 as (
    SELECT
        c.customer,
        ROUND(SUM(net_sales)/1000000, 2) as net_sales_mln
    FROM net_sales n
    JOIN dim_customer c
        ON c.customer_code = n.customer_code
    WHERE fiscal_year = 2021
    GROUP BY c.customer
    )
SELECT
    *,
    net_sales_mln*100/SUM(net_sales_mln) OVER()as pct
FROM cte1
ORDER BY net_sales_mln DESC

```

Result Grid:

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer	net_sales_mln	pct
Amazon	109.03	13.233402
Atliq Exclusive	79.92	9.700206
Atliq e Store	70.31	8.533803
Sage	27.07	3.285593
Flipkart	25.25	3.064692
Leader	24.52	2.976089
Neptune	21.01	2.550067
Ebay	19.88	2.412914
Electricalsocity	16.25	1.972327
Synthetic	16.10	1.954121
Electricalslytical	15.64	1.898289
Acclaimed Sto...	14.32	1.738075
Propel	14.14	1.716228
Novus	12.91	1.566938
Expression	12.90	1.565724
Reliance Digital	12.75	1.547518
walmart	12.63	1.532953

Bar Chart:



VI. Net Sales % share by region:

Create a region wise (APAC, EU, LTAM etc.) net sales % breakdown by customers in a respective region so that a regional analysis can be performed on financial performance of company.

The end result should be a pie chart for the FY 2021.

Query:

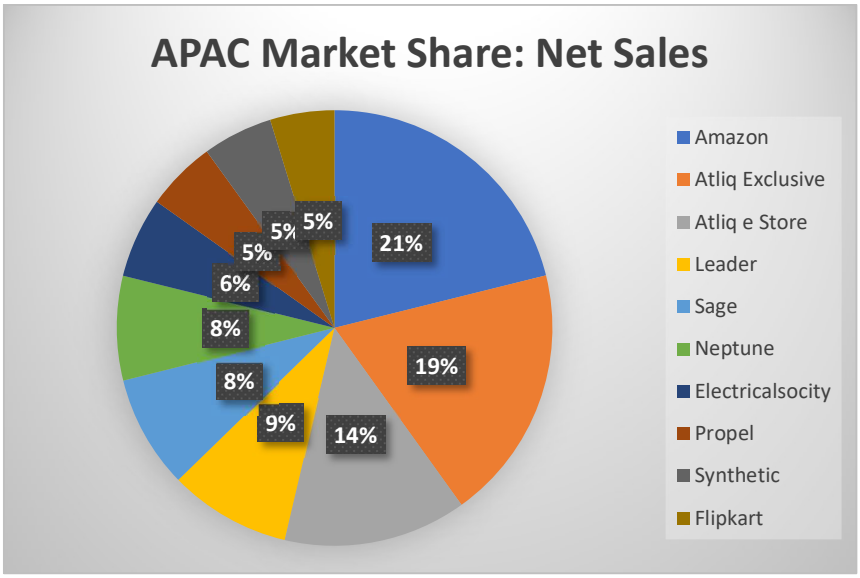
```
30  WITH cte1 as (
31      SELECT
32          c.customer, c.region,
33          ROUND(SUM(net_sales)/1000000, 2) as net_sales_mln
34      FROM net_sales s
35      JOIN dim_customer c
36          ON c.customer_code = s.customer_code
37      WHERE s.fiscal_year = 2021
38      GROUP BY c.region, c.customer
39      )
40  SELECT
41      *,
42      net_sales_mln*100/SUM(net_sales_mln) OVER(PARTITION BY region) as regional_net_sales_pct
43  FROM cte1
44  ORDER BY region, net_sales_mln DESC;
```

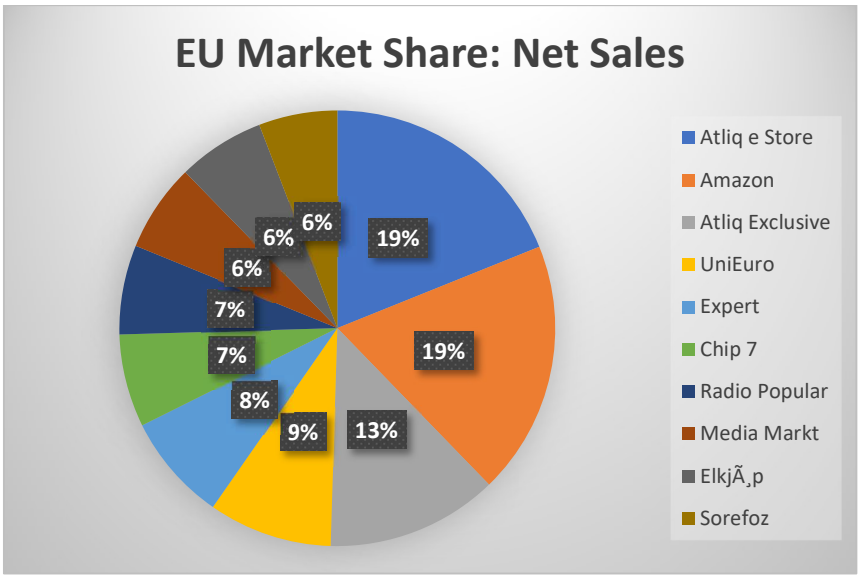
Result Grid:

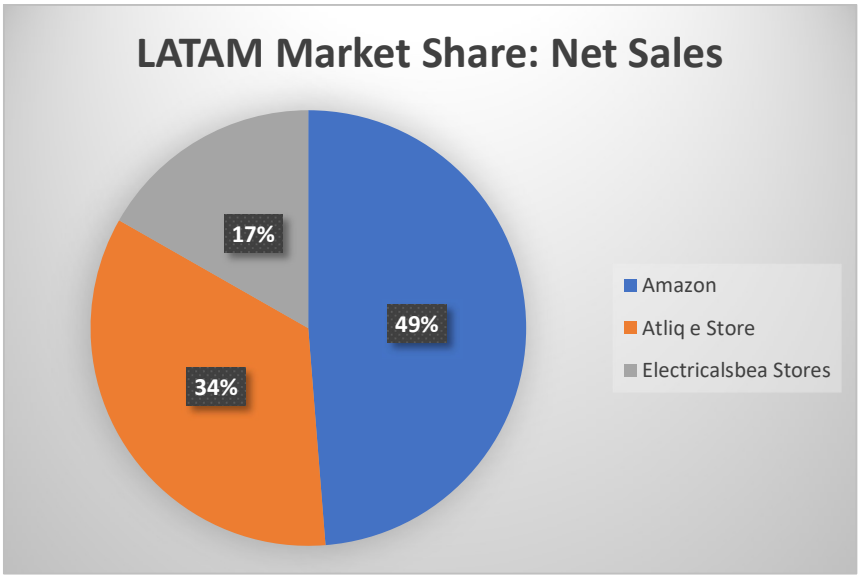
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

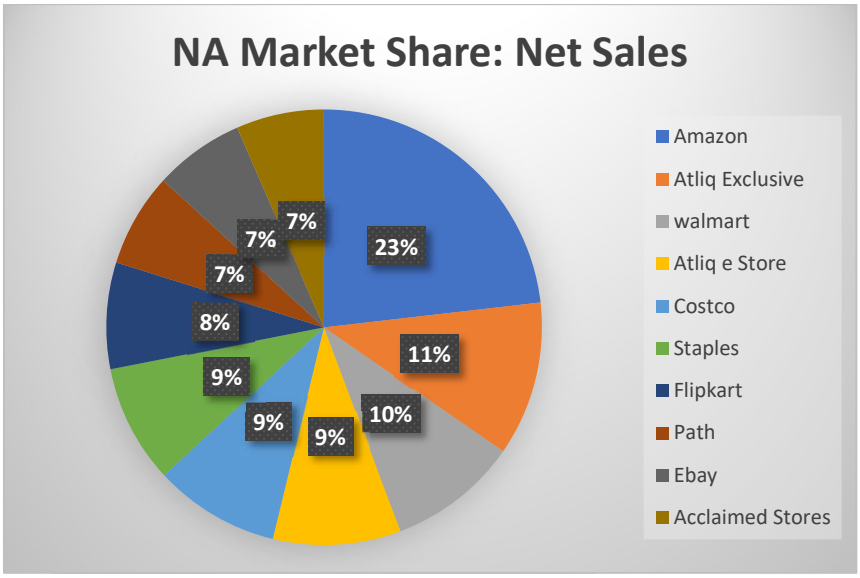
customer	region	net_sales_mln	regional_net_sales_pct
Amazon	APAC	57.41	12.988688
Atliq Exclusive	APAC	51.58	11.669683
Atliq e Store	APAC	36.97	8.364253
Leader	APAC	24.52	5.547511
Sage	APAC	22.85	5.169683
Neptune	APAC	21.01	4.753394
Electricalsocity	APAC	16.25	3.676471
Propel	APAC	14.14	3.199095
Synthetic	APAC	14.14	3.199095
Flipkart	APAC	12.96	2.932127
Novus	APAC	12.91	2.920814
Expression	APAC	12.90	2.918552
Girias	APAC	11.30	2.556561
Vijay Sales	APAC	11.27	2.549774
Ebay	APAC	11.14	2.520362
Reliance Digital	APAC	11.10	2.511312
Electricalslytical	APAC	11.08	2.506787

Pie Chart:






LATAM Market Share: Net Sales
17%
49%
34%
Amazon
Atliq e Store
Electricalsbea Stores


NA Market Share: Net Sales
7%
7%
7%
23%
8%
11%
9%
10%
9%
9%
Amazon
Atliq Exclusive
walmart
Atliq e Store
Costco
Staples
Flipkart
Path
Ebay
Acclaimed Stores

VII. Get top n products in each division by their quantity sold

Write a stored procedure for getting top n products in each division by their quantity sold in a given financial year.

Query:

```sql
# Top n products by their qty sold in each division

WITH cte1 as (
    SELECT
        p.division, p.product,
        SUM(sold_quantity) as total_qty
    FROM fact_sales_monthly s
    JOIN dim_product p
        ON p.product_code = s.product_code
    WHERE s.fiscal_year = 2021
    GROUP BY p.product, p.division
),
    cte2 as (
        SELECT
            *,
            DENSE_RANK() OVER(PARTITION BY division ORDER BY total_qty DESC) as drnk
        FROM cte1
        )
SELECT * FROM cte2
WHERE drnk<=3
```

Result Grid:

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

division	product	total_qty	drnk
N & S	AQ Pen Drive DRC	2034569	1
N & S	AQ Digit SSD	1240149	2
N & S	AQ Clx1	1238683	3
P & A	AQ Gamers Ms	2477098	1
P & A	AQ Maxima Ms	2461991	2
P & A	AQ Master wireless x1 Ms	2448784	3
PC	AQ Digit	135092	1
PC	AQ Gen Y	135031	2
PC	AQ Elite	134431	3

VIII. Forecast Accuracy for all customers for a given fiscal year.

To generate a forecast accuracy report for all customers for a given fiscal year, in order tot rack the accuracy of forecast is being made for all customers.

The report should have the following fields:

1. Customer code, Name, Market
2. Total sold quantity
3. Total forecast quantity
4. Net error
5. Absolute error
6. Forecast accuracy%

Query:

Name: new_procedure

DDL:

```
CREATE PROCEDURE `get_forecast/-accuracy` (
    in_fiscal_year INT
)
BEGIN
    WITH forecast_err_table as (
        SELECT
            a.customer_code,
            SUM(sold_quantity) as total_sold_quantity,
            SUM(forecast_quantity) as total_forecast_quantity,
            SUM((forecast_quantity - sold_quantity)) as net_err,
            SUM((forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as net_err_pct,
            SUM(ABS (forecast_quantity - sold_quantity)) as abs_err,
            SUM(ABS (forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as abs_err_pct
        FROM fact_act_est a
        WHERE a.fiscal_year = in_fiscal_year
        GROUP BY a.customer_code
        )
SELECT
    e.customer_code,
    c.customer,
    c.market,
    e.total_sold_quantity, e.total_forecast_quantity,
    e.net_err, e.net_err_pct, e.abs_err, e.abs_err_pct,
    IF (abs_err_pct > 100, 0, 100-abs_err_pct) as forecast_accuracy
FROM forecast_err_table e
JOIN dim_customer c
    USING (customer_code)
ORDER BY forecast_accuracy DESC;
END
```

Result Grid:

```
call gdb0041.`get_forecast/-accuracy`(2021);
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer_code	customer	market	total_sold_quantity	total_forecast_quantity	net_err	net_err_pct	abs_err	abs_err_pct	forecast_accuracy
90013120	Coolblue	Italy	109547	133532	23985	17.9620	70467	52.7716	47.2284
70010048	Atliq e Store	Bangladesh	119439	142010	22571	15.8940	75711	53.3139	46.6861
90023027	Costco	Canada	236189	279962	43773	15.6353	149303	53.3297	46.6703
90023026	Relief	Canada	228988	273492	44504	16.2725	146948	53.7303	46.2697
90017051	Forward Stores	Portugal	86823	118067	31244	26.4629	63568	53.8406	46.1594
90017058	Mbit	Portugal	86860	110195	23335	21.1761	59473	53.9707	46.0293
90023028	walmart	Canada	239081	283323	44242	15.6154	153058	54.0224	45.9776
90023024	Sage	Canada	246397	287233	40836	14.2170	155610	54.1755	45.8245
90013124	Amazon	Italy	110898	136116	25218	18.5268	73826	54.2376	45.7624
90015146	Mbit	Norway	147152	210507	63355	30.0964	114189	54.2448	45.7552
90017054	Flawless Stores	Portugal	84371	114698	30327	26.4407	62483	54.4761	45.5239
70027208	Atliq e Store	Brazil	33713	47321	13608	28.7568	25784	54.4874	45.5126
90015147	Chiptec	Norway	154897	223867	68970	30.8085	122100	54.5413	45.4587
80001019	Neptune	China	1113979	1275248	161269	12.6461	695779	54.5603	45.4397
90015144	Sound	Norway	160074	225637	65563	29.0568	123257	54.6262	45.3738
90009130	Logic Stores	Newzealand	103290	110175	6885	6.2491	60225	54.6630	45.3370
90015149	UniEuro	Norway	142086	212500	70414	33.1360	116172	54.6692	45.3308
90021088	Electricalslytical	United Kin...	224350	323689	99339	30.6896	176975	54.6744	45.3256
90017050	Electricalsara ...	Portugal	85272	114688	29416	25.6487	62760	54.7224	45.2776
70013125	Atliq Exclusive	Italy	101658	123428	21770	17.6378	67546	54.7250	45.2750
90021094	Coolblue	United Kin...	208512	301367	92855	30.8113	165043	54.7648	45.2352
70009134	Atliq e Store	Newzealand	103747	110791	7044	6.3579	60726	54.8113	45.1887
90013118	Fnac-Darty	Italy	101847	126289	24442	19.3540	69242	54.8282	45.1718
70017060	Atliq e Store	Portugal	89925	120744	30819	25.5242	66285	54.8971	45.1029
70023031	Atliq Exclusive	Canada	234114	286297	52183	18.2269	157171	54.8979	45.1021
90023025	Premium Stores	Canada	220808	266351	45543	17.0989	146235	54.9031	45.0969
90013122	Radio Popular	Italy	100746	123516	22770	18.4349	67822	54.9095	45.0905
90017053	Info Stores	Portugal	84149	111740	27591	24.6921	61373	54.9248	45.0752
90017059	Amazon	Portugal	87828	114154	26326	23.0618	62720	54.9433	45.0567
90023022	Nomad Stores	Canada	225182	264886	39704	14.9891	145544	54.9459	45.0541
90002007	Girias	India	746226	778757	32531	4.1773	427909	54.9477	45.0523

IX. Forecast Accuracy Difference between 2020 & 2021

The supply chain business manager wants to see which customers' forecast accuracy has dropped from 2020 to 2021. Provide a complete report with these columns: customer code, customer name, market, forecast accuracy 2020 & forecast accuracy 2021.

Query:

```sql
CREATE TEMPORARY TABLE forecast_accuracy_2020
WITH forecast_err_table as (
        SELECT
            a.customer_code,
            SUM(sold_quantity) as total_sold_quantity,
            SUM(forecast_quantity) as total_forecast_quantity,
            SUM((forecast_quantity - sold_quantity)) as net_err,
            SUM((forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as net_err_pct,
            SUM(ABS (forecast_quantity - sold_quantity)) as abs_err,
            SUM(ABS (forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as abs_err_pct
        FROM fact_act_est a
        WHERE a.fiscal_year = 2020
        GROUP BY a.customer_code
        )
SELECT
    e.customer_code,
    c.customer,
    c.market,
    IF (abs_err_pct > 100, 0, 100-abs_err_pct) as forecast_accuracy_2020
FROM forecast_err_table e
JOIN dim_customer c
    USING (customer_code)
ORDER BY forecast_accuracy_2020 DESC;

CREATE TEMPORARY TABLE forecast_accuracy_2021
WITH forecast_err_table as (
        SELECT
            a.customer_code,
            SUM(sold_quantity) as total_sold_quantity,
            SUM(forecast_quantity) as total_forecast_quantity,
            SUM((forecast_quantity - sold_quantity)) as net_err,
            SUM((forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as net_err_pct,
            SUM(ABS (forecast_quantity - sold_quantity)) as abs_err,
            SUM(ABS (forecast_quantity - sold_quantity))*100/SUM(forecast_quantity) as abs_err_pct
        FROM fact_act_est a
        WHERE a.fiscal_year = 2021
        GROUP BY a.customer_code
        )
SELECT
    e.customer_code,
    c.customer,
    c.market,
    IF (abs_err_pct > 100, 0, 100-abs_err_pct) as forecast_accuracy_2021
FROM forecast_err_table e
JOIN dim_customer c
    USING (customer_code)
ORDER BY forecast_accuracy_2021 DESC;
```

```
50 •  SELECT
51        a.customer_code,
52        a.customer,
53        a.market,
54        a.forecast_accuracy_2020,
55        b.forecast_accuracy_2021
56    FROM forecast_accuracy_2020 a
57    JOIN forecast_accuracy_2021 b
58        USING (customer_code);
```

Result Grid:

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

customer_code	customer	market	forecast_accuracy_2020	forecast_accuracy_2021
90013120	Coolblue	Italy	25.3765	47.2284
70010048	Atliq e Store	Bangladesh	36.8623	46.6861
90023027	Costco	Canada	34.7451	46.6703
90023026	Relief	Canada	40.1885	46.2697
90017051	Forward Stores	Portugal	17.7497	46.1594
90017058	Mbit	Portugal	15.4457	46.0293
90023028	walmart	Canada	36.8299	45.9776
90023024	Sage	Canada	38.5867	45.8245
90013124	Amazon	Italy	3.7695	45.7624
90015146	Mbit	Norway	0.8633	45.7552
90017054	Flawless Stores	Portugal	13.7631	45.5239
70027208	Atliq e Store	Brazil	35.3401	45.5126
90015147	Chiptec	Norway	6.3840	45.4587
80001019	Neptune	China	23.3969	45.4397
90015144	Sound	Norway	8.3672	45.3738
90009130	Logic Stores	Newzealand	0.0589	45.3370
90015149	UniEuro	Norway	7.9063	45.3308
90021088	Electricalslytical	United Kin...	36.0122	45.3256
90017050	Electricalsara ...	Portugal	17.8925	45.2776
70013125	Atliq Exclusive	Italy	27.5868	45.2750
90021094	Coolblue	United Kin...	37.9381	45.2352
70009134	Atliq e Store	Newzealand	0.0000	45.1887
90013118	Fnac-Darty	Italy	27.9470	45.1718
70017060	Atliq e Store	Portugal	0.0000	45.1029
70023031	Atliq Exclusive	Canada	36.8011	45.1021