**Project Title : Scarcity\_items ,Overstocked Items and Disputes analysis**

**Problem Statement:**Monitor and analyze trends in demand, supply, customer conversion, and experience metrics of items categorized as scarce or potentially scarce using Sql.

**Dataset Overview:**

1. **Item\_ID:** A unique identifier for each item (e.g., ITEM00000, ITEM00001).
2. **Category:** The product category (e.g., "Home Appliances," "Toys," "Groceries," "Apparel," "Electronics").
3. **Region:** The geographical region where the item is stocked or sold (e.g., "South," "West," "Central," "East," "North").
4. **Date:** The date of the recorded transaction or inventory update (e.g., 7/27/2023, 1/1/2023).
5. **Stock\_Level:** The current inventory level (quantity available in stock).
6. **Demand:** The number of units requested or expected to be sold.
7. **Supply:** The number of units available or supplied.
8. **Is\_Scarce:** A binary indicator (Yes/No) showing whether the item is currently in short supply.
9. **Potentially\_Scarce:** A binary indicator (Yes/No) flagging items that may become scarce in the future.
10. **Conversion\_Rate:** How much Demand fullfilled by seller by available stocks
11. **Experience\_Score:** A numerical score (possibly customer satisfaction or employee performance rating).
12. **Dispute\_Amount:** A value related to disputes (e.g., refunds, claims).
13. **Win\_Amount:** The amount recovered or won in a dispute.
14. **Recouped\_Amount:** The amount successfully recouped (e.g., from losses or disputes).
15. **Tag\_Status:** The status of the item (e.g., "Reviewed," "Flagged," "Resolved," "Escalated").
16. **Net\_Loss:** The net financial loss by seller
17. **Spike\_Indicator:** It is a binary flag (Yes/No) that identifies sudden, abnormal changes in demand, supply, or sales activity for a specific item.

**FORMULAS:**1) For Calculating **Conversion\_Rate** =(Stock\_level+Supply)/Demand

**Conversion rate means**= Units you can fullfill / Total units Demanded

**Stock\_Level** = Units on hand

**Supply** = Incoming units

**Demand** = Requested units

**2)** For Calculating **Net\_Loss =** (Dispute\_ Amount-( Win\_Amount + Recouped\_Amount ))

**Analyzing Scarce\_items\_analysis dataset using sql**

**1)Renaming Table Name**

**Query:**

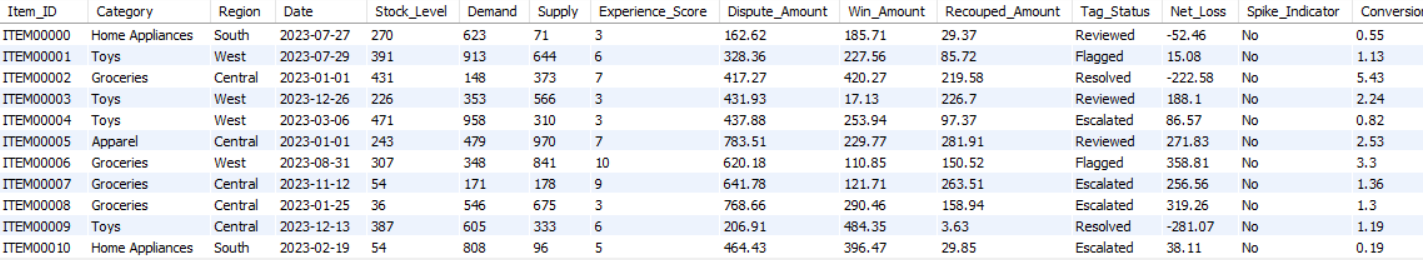
Rename table scarce\_items\_analysis\_edited to item\_analysis;



**2) Displaying all values**

**Query:**

Select \* from item\_analysis;



**3) Identifying Current Scarce Items (**mentioned as **shortage\_Gap)**

**Query:**

SELECT Item\_ID,Category,Region,Date,

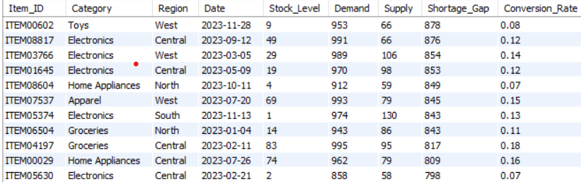
Stock\_Level,Demand,

(Demand- (Stock\_level+supply)) AS Shortage\_Gap,

Conversion\_Rate, Experience\_Score,

Net\_Loss,Spike\_Indicator FROM item\_analysis WHERE Is\_Scarce = 'Yes'

ORDER BY Shortage\_Gap DESC;



**Explanation:**

Here the demand which wasn’t fulfilled by the seller is mentioned as the **Shortage\_Gap** ,Higher the **Shortage\_Gap** lower the conversion Rate.

**4) Items with Poor Conversion Rate**

**Query:**

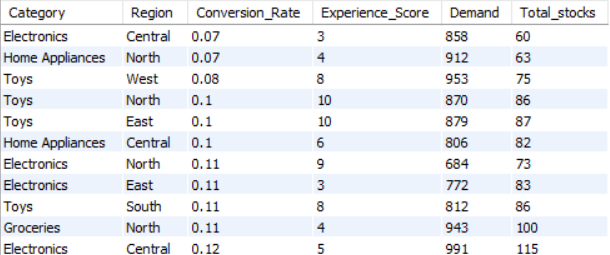
SELECT Category, Region, Conversion\_Rate,

Experience\_Score,

Demand, (Supply+Stock\_level) as Total\_stocks

FROM item\_analysis WHERE (Is\_Scarce = 'Yes')

AND Conversion\_Rate < 1 ORDER BY Conversion\_Rate;



**Explanation:**

This shows very poor conversion rate due to more Scarcity

**5) Detect understocked and Overstocked items**

**Query:**

SELECT Item\_ID, Category

CASE

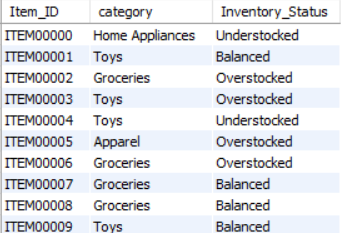
WHEN (stock\_level+Supply) < Demand THEN 'Understocked'

WHEN (stock\_level+Supply )> Demand \* 1.5 THEN 'Overstocked'

ELSE 'Balanced'

END AS Inventory\_Status

FROM item\_analysis;



**Explanation:**

This shows the Inventory status based on demand from customer.

**6) Net Loss Analysis for each Category**

**Query:**

SELECT

Category,

Round( SUM(Net\_Loss),2) AS Total\_Net\_Loss,

Round( AVG(Net\_Loss),2) AS Avg\_Net\_Loss,

COUNT(item\_id) AS Item\_Count

FROM item\_analysis

WHERE net\_loss>0

GROUP BY Category

ORDER BY Total\_Net\_Loss DESC;

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**Explanation:**

This shows the loss for seller in each category due to compliance in products, quality issues ,So the amount is refunded to customer .This will be the loss for seller which is calculated as **Total\_Net\_Loss**,**Avg\_Net\_Loss**.

**7)Finding Spike occurring on particular category based on demand**

SELECT

Item\_ID,

Date,

Demand,

Supply,

Stock\_Level,

(Demand - (Supply+stock\_level)) AS Demand\_Supply\_Gap,

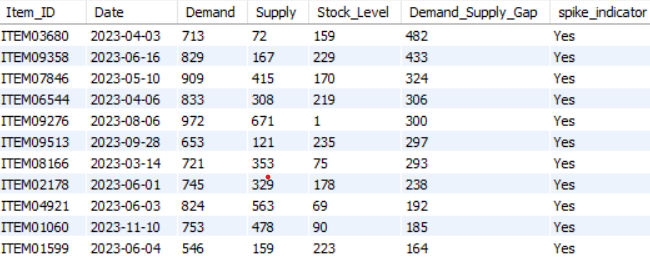
spike\_indicator

FROM item\_analysis

WHERE Spike\_Indicator = 'Yes'

AND Category = 'Electronics'

ORDER BY Demand\_Supply\_Gap DESC;



**Explanation:**

This **Demand\_supply\_gap** tells the remaining current demand which was not fullfilled by our available products in inventory**.**

**8)** **Spikes in 2023 ( Like Holiday Season )**

SELECT

Category,

COUNT(\*) AS Total\_Items,

COUNT(CASE WHEN Spike\_Indicator = 'Yes' THEN 1 END) AS Spike\_Items

FROM item\_analysis

WHERE Date BETWEEN '2023-11-01' AND '2023-12-31'

GROUP BY Category

ORDER BY Spike\_Items DESC;

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**Explanation:**

Here **Spike\_Items** means highly demanded products ,So In these months there will be holiday vacations for students ,so the **need of Groceries and Apparel(Clothing)** ,**Toys** **etc** demand is increasing

**9) Monthly demand trends**

**Query:**

SELECT

EXTRACT(MONTH FROM Date) AS Month,

Round( AVG(Demand),2) AS Avg\_Demand

FROM item\_analysis

GROUP BY Month

ORDER BY Month;

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**Explanation:**  
This Shows the Monthly Avg\_Demand for each category products which includes **Groceries, Electronics, Home Appliances** etc

**10)Filter Scarce Items with Spikes**

**Query:**

SELECT Item\_ID, Category, Demand

FROM item\_analysis

WHERE Is\_Scarce = 'Yes' AND Spike\_Indicator = 'Yes';

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**Explanation:**This Shows sudden high demand for products which is indicated by spike\_indicator and Is\_Scarcity

**11) Finding Is\_Scarce\_Percentage**

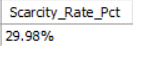
**Query:**

Select Concat( Round (COUNT(

CASE WHEN Is\_Scarce = 'Yes' THEN 1 END) \* 100.0 / COUNT(Item\_id),2),'%')

AS Scarcity\_Rate\_Pct

FROM item\_analysis;



**12) Finding Potential\_Scarce Items**

**Query:**

Select item\_id,category ,demand as Current\_demand,(supply+stock\_level) AS Current\_Stocks\_Avail from item\_analysis where potentially\_scarce='Yes' ;

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**Explanation:**

Eventhough the Current\_Stocks can fullfill the Current\_Demand now , afterwards there will be only few Current\_Stocks will be available .So we need to refill the Current\_Stocks as soon as possible based on **Potentially\_Scarce** because anytime we get the next huge demand .

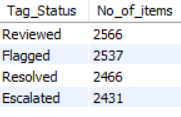
**13) Finding no of items based on Tag\_Status**

**Query:**

Select Tag\_Status,count(\*)as No\_of\_items from item\_analysis

where Tag\_Status in ('Flagged', 'Escalated', 'Reviewed', 'Resolved')

group by Tag\_Status;



**Explanation:**

Counting no of Items based on their Tag\_Status

**14) Find** **User Experience Rating Percentage**

**Query:**

SELECT Concat(Round(count(case when experience\_score in (1,2,3,4

) then 1 End )\* 100 / Count(experience\_score),2),'%') as Low\_Rating\_Percentage,

Concat(Round(count(case when experience\_score in (5,6,7

) then 1 End )\* 100 / Count(experience\_score),2),'%') as Avg\_Rating\_Percentage,

Concat(Round(count(case when experience\_score in (8,9,10

) then 1 End )\* 100 / Count(experience\_score),2),'%') as High\_Rating\_Percentage from item\_analysis

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**Explanation:**

This displays the rating percentage based on Experience\_score from(1 to 10).

1 to 4 = Low Rating  
5 to 7 = Average Rating  
8 to 10 = High Rating

**Areas to be Improved:**

* Need to reduce the **Scarcity\_rate** and to store additional stocks in our inventory and make dealer ready, to refill the products as soon as stock\_level is reduced in any category ,to improve **Conversion\_Rate**.
* Need Improvement in **Buying good quality Products** From Good Dealer and Good Manufacturer to reduce **Net\_Loss** on Each Category**.** Without this we may not able to build trust among Customers.