use [Supply Chain]

go

----Reports Related to Revenue and Sales -

----- 1. Count of products per each product type ?

select distinct(count(sku\_id)) as Count\_of\_Product, p.Product\_type

from Operations as o

join Product\_Type as p

on o.Product\_Type\_ID = p.Product\_Type\_ID

group by Product\_type,o.Product\_Type\_ID,p.Product\_type

-----2. How is revenue and sold products Quantity distributed by customer demographics?

select D.Customer\_demographics, round(sum(revenue\_generated),2) as Total\_Revenue , SUM(number\_of\_products\_sold) as Total\_Quantity

from operations as o

join Demographics as d

on o.CustomerDemoID = d.CustomerDemoID

group by D.Customer\_demographics

order by Total\_Revenue desc

------3. What is the revenue for each supplier?

select s.supplier\_name , round(sum(revenue\_generated),2) as Total\_Revenue

from operations as o

join Supplier as s

on o.SupplierID = s.SupplierID

group by Supplier\_name

order by Total\_Revenue desc

-------4. What is the revenue, total cost, and profit for each product type?

select p.product\_type , round(sum(revenue\_generated),2) as Total\_Revenue, round(sum(costs),2) as Total\_Cost, round(sum(revenue\_generated - costs ),2) as Total\_Profit

from Operations as o

join Product\_Type as p

on o.Product\_Type\_ID = p.Product\_Type\_ID

group by p.Product\_Type

order by Total\_Revenue desc

-------5. How is revenue distributed across different location?

select

l.location, round(SUM(revenue\_generated),2) as Total\_Revenue,

format((sum(o.revenue\_generated)/sum(sum(o.revenue\_generated)) over()),'P2') as Revenue\_Percentage

from Operations as o

join Locations as l

on o.LoactionID = l.LocationID

group by l.Location

order by Revenue\_Percentage desc

------- Reports Related to Sales and Quantities.

-----1. What is the quantity sold for each product compared to its price category?-------

SELECT P.SKU AS product,SUM(O.Number\_of\_products\_sold) AS Sold\_Quantity,

CASE

WHEN O.Price < (SELECT (AVG(Price)-10) FROM operations) THEN 'Low price'

WHEN O.Price >= (SELECT (AVG(Price)+10) FROM operations) THEN 'High price'

ELSE 'Average price'

END AS price\_category

FROM

Product AS P

JOIN

Operations AS O ON P.SKUID = O.SKU\_ID

GROUP BY

P.SKU, O.price

ORDER BY

P.sku ;

---Once we obtained the previous result, we wanted to dive deeper to comprehend the data, thus we posed the following two questions.

/\*count of products sold and total quantity sold for each price category \*/

WITH PriceCategories AS (

SELECT

P.SKU AS product,

SUM(O.Number\_of\_products\_sold) AS Sold\_Quantity,

CASE

WHEN O.Price < (SELECT (AVG(Price) - 10) FROM Operations) THEN 'Low price'

WHEN O.Price >= (SELECT (AVG(Price) + 10) FROM Operations) THEN 'High price'

ELSE 'Average price'

END AS price\_category

FROM

Product AS P

JOIN

Operations AS O ON P.SKUID = O.SKU\_ID

GROUP BY

P.SKU, O.Price

)

SELECT

price\_category,

COUNT(\*) AS Count\_Of\_Products,

SUM(Sold\_Quantity) AS Total\_Sold\_Quantity

FROM

PriceCategories

GROUP BY

price\_category

ORDER BY

price\_category;

/\*count of products sold and total quantity sold for each product type \*/

Select

pt.Product\_type,

COUNT(o.SKU\_ID) AS Count\_Of\_Products,

SUM(o.Number\_of\_products\_sold) AS Total\_Sold\_Quantity

From

Product\_Type as pt

join

Operations AS O ON Pt.Product\_Type\_ID = O.Product\_Type\_ID

GROUP BY pt.Product\_type ;

/\*2. What are the products sold with the highest and lowest defect rates? \*/

/\*lowest\_defect\_rate \*/

SELECT

TOP 1 p.SKU AS product,

MIN(o.Defect\_rates) AS lowest\_defect\_rate

FROM

Product AS p

JOIN

operations AS o ON p.SKUID = o.SKU\_ID

GROUP BY

p.SKU

ORDER BY

lowest\_defect\_rate ASC

/\*Highest\_defect\_rate\*/

SELECT

TOP 1 p.SKU AS product,

max(o.Defect\_rates) AS Highest\_defect\_rate

FROM

Product AS p

JOIN

operations AS o ON p.SKUID = o.SKU\_ID

GROUP BY

p.SKU

ORDER BY

Highest\_defect\_rate desc;

/\*3. How are shipping times related to quantities sold ?\*/

SELECT

o.Shipping\_times,

SUM(o.Number\_of\_products\_sold) AS total\_quantity\_sold

FROM Operations AS o

GROUP BY

o.Shipping\_times

ORDER BY

o.Shipping\_times;

/\*4. How is the quantity sold in each product type related to inspection result? \*/

SELECT

i.Inspection\_results,

SUM(o.Number\_of\_products\_sold) AS total\_quantity\_sold,

COUNT(o.SKU\_ID) AS Count\_Of\_Products

FROM

Operations AS o

join

Inspections as i

on i.InspectionResultID = o.InspectionResultID

GROUP BY

i.Inspection\_results

ORDER BY

SUM(o.Number\_of\_products\_sold);

/\*5. How is the quantity sold in each region defected by customer demographics?\*/

SELECT

d.Customer\_demographics,

SUM(o.Number\_of\_products\_sold) AS total\_quantity\_sold,

COUNT(o.SKU\_ID) AS Count\_Of\_Products

FROM

Operations AS o

join

demographics as d

on

d.CustomerDemoID =o.CustomerDemoID

GROUP BY

d.Customer\_demographics

ORDER BY

SUM(o.Number\_of\_products\_sold);

--Reports Related to Suppliers and Supply Chain

---1. analyze the supplier’s performance in terms of efficiency (product sold quantity, stock level, shortest supply time, lowest defect rates, min cost, max profit, and revenue).---

SELECT

s.Supplier\_name,

SUM(o.Number\_of\_products\_sold) AS total\_products\_sold,

AVG(o.Stock\_levels) AS average\_stock\_level,

MIN(o.Supplier\_Lead\_time) AS shortest\_supply\_time,

MIN(o.Defect\_rates) AS lowest\_defect\_rate,

MIN(o.Manufacturing\_costs) AS min\_cost,

MAX(o.Revenue\_generated - o.Manufacturing\_costs) AS max\_profit,

SUM(o.Revenue\_generated) AS total\_revenue

FROM Supplier s

JOIN Operations o ON s.SupplierID = o.SupplierID

GROUP BY s.Supplier\_name

ORDER BY total\_products\_sold DESC, max\_profit DESC;

-----2. What percentage of products pass inspections based on supplier?

SELECT

s.Supplier\_name,

COUNT(CASE WHEN i.Inspection\_results = 'Pass' THEN 1 END) \* 100.0 / COUNT(\*) AS pass\_percentage

FROM Supplier s

JOIN Operations o ON s.SupplierID = o.SupplierID

JOIN Inspections i ON o.InspectionResultID = i.InspectionResultID

GROUP BY s.Supplier\_name

ORDER BY pass\_percentage DESC;

--3. How do transportation modes and routes affect lead times from each supplier?

SELECT

s.Supplier\_name,

t.Transportation\_modes,

r.Routes,

AVG(o.Supplier\_Lead\_time) AS average\_lead\_time

FROM Supplier s

JOIN Operations o ON s.SupplierID = o.SupplierID

JOIN Transportation t ON o.TransportationModeID = t.TransportationModeID

JOIN Routes r ON o.RouteID = r.RouteID

GROUP BY s.Supplier\_name, t.Transportation\_modes, r.Routes

ORDER BY average\_lead\_time ASC;

---4. How does the inspection result impact the total profit by suppliers?

SELECT

s.Supplier\_name,

i.Inspection\_results,

SUM(o.Revenue\_generated - o.Manufacturing\_costs) AS total\_profit

FROM Supplier s

JOIN Operations o ON s.SupplierID = o.SupplierID

JOIN Inspections i ON o.InspectionResultID = i.InspectionResultID

GROUP BY s.Supplier\_name, i.Inspection\_results

ORDER BY total\_profit DESC;

----Reports Related to Costs

----1. What is the relationship between manufacturing costs and revenue for each product type?

SELECT

[Product\_Type\_ID],

SUM([Manufacturing\_costs]) AS TotalManufacturingCost,

SUM([Revenue\_generated]) AS TotalRevenue,

(SUM([Revenue\_generated]) - SUM([Manufacturing\_costs])) AS ProfitOrLoss

FROM

Operations

GROUP BY

[Product\_Type\_ID];

----2. What are the shipping costs by different shipping companies and location?

SELECT

CarrierID,

LoactionID,

SUM(Shipping\_costs) AS TotalShippingCost

FROM

Operations

GROUP BY

CarrierID,

LoactionID

ORDER BY

CarrierID,

LoactionID;

----3. How are transportation costs distributed by routes and transportation mode used?

SELECT

RouteID,

TransportationModeID,

SUM(Costs) AS TotalTransportationCost

FROM

Operations

GROUP BY

RouteID,

TransportationModeID

ORDER BY

RouteID,

TransportationModeID;

----4. How do shipping costs impact on the total revenue for each shipping company?

SELECT

CarrierID,

SUM(Shipping\_costs) AS TotalShippingCost,

SUM(Revenue\_generated) AS TotalRevenue,

(SUM(Revenue\_generated) - SUM(Shipping\_costs)) AS NetImpact

FROM

Operations

GROUP BY

CarrierID

ORDER BY

CarrierID;

----5. How do shipping costs affect the number of products sold by location

SELECT

LoactionID,

SUM(Shipping\_costs) AS TotalShippingCost,

SUM(Number\_of\_products\_sold) AS TotalProductsSold

FROM

Operations

GROUP BY

LoactionID

ORDER BY

LoactionID;

----Reports Related to Quality

----1. Failure rates in product inspection by location.

select count(\*) as "Total Products", inspection\_results, location

from operations o join Inspections i

on o.InspectionResultID = i.InspectionResultID

join locations l

on o.LoactionID = l.LocationID

where Inspection\_results = 'Fail'

group by Inspection\_results, location

----2. What are total costs for defective products for each product type?

select format(sum(costs), 'N2') as "Total Cost", Product\_Type

from Operations o join Product\_Type p

on o.Product\_Type\_ID = p.Product\_Type\_ID

join Inspections i

on o.InspectionResultID = i.InspectionResultID

where Inspection\_results = 'Fail'

group by Product\_Type

------3. What percentage of products inspections result based on supplier?

select format(sum(Defect\_rates)/227.715799400583, 'P2') as Defect\_Rates, Supplier\_name

from Operations o join Supplier s

on o.SupplierID = s.SupplierID

group by Supplier\_name

------4. Are the results in inspections result can affect sales volume?

select format(sum(Revenue\_generated),'N2') as "Sales Revenue", Inspection\_results

from operations o join inspections i

on o.InspectionResultID = i.InspectionResultID

group by Inspection\_results

----Reports Related to Location and Shipping companies

------1. What is the average shipping cost per product by shipping companies?

SELECT

P.SKU AS Product,

SC.Shipping\_carriers AS ShippingCompany,

ROUND(AVG(O.Shipping\_costs), 2) AS AvgShippingCost

FROM

Operations O

JOIN

Product P ON O.SKU\_ID = P.SKUID

JOIN

[Shipping Carriers] SC ON O.CarrierID = SC.CarrierID

GROUP BY

P.SKU, SC.Shipping\_carriers;

------2. How does revenue vary by rote and transportation mode?

SELECT

R.Routes AS Route,

T.Transportation\_modes AS TransportationMode,

Round(SUM(O.Revenue\_generated),2) AS TotalRevenue

FROM

Operations O

JOIN

Routes R ON O.RouteID = R.RouteID

JOIN

Transportation T ON O.TransportationModeID = T.TransportationModeID

GROUP BY

R.Routes, T.Transportation\_modes;

------3. What is the most used rote and transportation mode for each company?

WITH RouteTransportationUsage AS (

SELECT

SC.Shipping\_carriers AS ShippingCompany,

R.Routes AS Route,

T.Transportation\_modes AS TransportationMode,

SUM(O.Order\_quantities) AS TotalUsage,

ROW\_NUMBER() OVER (PARTITION BY SC.Shipping\_carriers ORDER BY SUM(O.Order\_quantities) DESC) AS UsageRank

FROM

Operations O

JOIN

[Shipping Carriers] SC ON O.CarrierID = SC.CarrierID

JOIN

Routes R ON O.RouteID = R.RouteID

JOIN

Transportation T ON O.TransportationModeID = T.TransportationModeID

GROUP BY

SC.Shipping\_carriers, R.Routes, T.Transportation\_modes

)

SELECT

ShippingCompany,

Route,

TransportationMode,

TotalUsage

FROM

RouteTransportationUsage

WHERE

UsageRank = 1;

------4. Which shipping company has the highest percentage of best deliveries time (compare to the average value)?

WITH AverageDeliveryTime AS (

SELECT

AVG(O.Shipping\_times) AS AvgShippingTime

FROM

Operations O

),

BestDeliveryCount AS (

SELECT

SC.Shipping\_carriers AS ShippingCompany,

COUNT(\*) AS TotalDeliveries,

SUM(CASE WHEN O.Shipping\_times < ADT.AvgShippingTime THEN 1 ELSE 0 END) AS BestDeliveries

FROM

Operations O

JOIN

[Shipping Carriers] SC ON O.CarrierID = SC.CarrierID

CROSS JOIN

AverageDeliveryTime ADT

GROUP BY

SC.Shipping\_carriers

),

BestDeliveryPercentage AS (

SELECT

ShippingCompany,

BestDeliveries,

TotalDeliveries,

(CAST(BestDeliveries AS FLOAT) / TotalDeliveries) \* 100 AS BestDeliveryPercentage

FROM

BestDeliveryCount

)

SELECT

TOP 1 ShippingCompany,

BestDeliveryPercentage

FROM

BestDeliveryPercentage

ORDER BY

BestDeliveryPercentage DESC;