Task 1: Data Download, Import, and Database Connection

In [4]:
```
# -- Load the sql extention ----
%load_ext sql

# --- Load your mysql db using credentials from the "DB" area ---
%sql mysql+pymysql://bc3ffa0e:Cab#22se@localhost/bc3ffa0e
```

```
The sql extension is already loaded. To reload it, use:
  %reload_ext sql
```

Out[4]:
```
'Connected: bc3ffa0e@bc3ffa0e'
```

Task 1: Revenue Analysis

We're checking how much money our startup has made from selling products. This helps us understand if our business is doing well and if customers like what we offer.

In [5]:
```
%%sql

SELECT round(SUM(`Revenue generated`),2) AS total_revenue
FROM chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[5]:

total_revenue
577604.82

Task 2: Revenue Analysis by Product Type

We're examining how much money our startup makes from selling each type of product. This helps us understand which products are most profitable and popular among our customers, guiding our future business decisions.

In [6]:
```
%%sql

SELECT `Product type`,round(SUM(`Revenue generated`),2) AS total_revenue
FROM chain
group by `Product type`
order by total_revenue desc;
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[6]:

Product type	total_revenue
skincare	241628.16
haircare	174455.39
cosmetics	161521.27

Task 3: Revenue Analysis by Location

We're analyzing how much money our startup makes from sales in each location. This helps us identify which areas are most profitable, allowing us to allocate resources effectively and tailor our strategies to meet the needs of different regions.

In [7]:
```
%%sql

SELECT location, CAST(ROUND(SUM(`Revenue generated`), 2) AS DECIMAL(10,2)) as Re
FROM chain
GROUP BY location
ORDER BY Revenue DESC;
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
5 rows affected.
```

Out[7]:

location	Revenue
Mumbai	137755.03
Kolkata	137077.55
Chennai	119142.82
Bangalore	102601.72

Task 5: Stock Levels and Lead Times Analysis

We're examining the total stock levels and lead times for our products. This helps us understand how much inventory we have on hand and how long it takes for products to be ready for sale. By knowing this information, we can ensure we have enough stock to meet demand and minimize delays in fulfilling orders.

In [17]:
```
%%sql
select sum(`Stock levels`) as total_stock_levels, sum(`Lead times`) as total_lea
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[17]:

total_stock_levels	total_lead_times
4777	1596

Task 6: Order Quantities Analysis

We're calculating the total quantity of orders placed for our products. This helps us understand the overall demand for our products and ensures that we have enough stock on hand to fulfill customer orders. By knowing the total order quantities, we can plan production and inventory management more effectively.

In [18]:
```
%%sql
select sum(`Order quantities`) as total_quantity
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[18]:

total_quantity
4922

Task 7: Order Quantities Analysis by Location

We're analyzing the total order quantities for each location where our products are sold. This helps us understand the demand for our products in different areas and ensures that we can allocate inventory and resources accordingly. By knowing the order quantities by location, we can optimize our supply chain and meet customer demand effectively.

In [19]:
```
%%sql
select location,sum(`Order quantities`) as Order_quantities
from chain
group by location
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
5 rows affected.
```

Out[19]:

location	Order_quantities
Mumbai	1083
Kolkata	1228
Delhi	733
Bangalore	769
Chennai	1109

Task 8: Most Costly Products Analysis

We're identifying the products that incur the highest manufacturing costs. This helps us understand which items have the highest production expenses, allowing us to evaluate their profitability and make informed decisions about pricing and production strategies. By knowing which products are the most costly to produce, we can optimize our resources and prioritize efforts to improve efficiency.

In [20]:
```
%%sql
select `product type`,cast(round(sum(`Manufacturing costs`),2) as decimal(10,2))
from chain
group by `product type`
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[20]:

product type	costly_product
haircare	1647.57
skincare	1959.73
cosmetics	1119.37

Task 9: Manufacturing Cost vs. Selling Price Analysis

We're examining the relationship between the manufacturing cost and selling price for each product type. This helps us understand how much profit we make from selling each product and whether our pricing strategy is effective. By analyzing this relationship, we can ensure that our products are priced competitively while maintaining profitability.

In [21]:
```
%%sql
select `product type`,round(sum(Price),2) Price,round(sum(`Manufacturing costs`)
ROUND(CAST((SUM(Price) - SUM(`Manufacturing costs`)) AS DECIMAL(10,2)), 2) AS `R
from chain
group by `product type`
order by `product type`
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[21]:

product type	Price	MC	Relation of MF
cosmetics	1491.39	1119.37	372.02
haircare	1564.49	1647.57	-83.09
skincare	1890.37	1959.73	-69.35

Task 11: Average Lead Time Analysis

We're calculating the average lead time for each product type to understand how long it takes for products to be ready for sale. This analysis helps us identify areas where lead times may be longer than expected, allowing us to streamline production processes and improve efficiency. By knowing the average lead time for each product type, we can ensure timely delivery to customers and maintain high levels of satisfaction.

In [23]:
```
%%sql
SELECT `product type`,round(AVG(`Lead times`),2) as Time
from chain
group by `product type`
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[23]:

product type	Time
haircare	15.53
skincare	16.70
cosmetics	15.38

Task 12: Impact of Lead Time on Stock Levels and Availability Analysis

We're examining how lead time influences stock levels and product availability. This analysis helps us understand the relationship between lead time and our ability to maintain sufficient inventory levels to meet customer demand. By knowing how lead time affects stock levels and availability, we can optimize our supply chain processes to ensure products are available when needed and minimize stockouts.

In [24]:
```
%%sql
SELECT SUM(`Lead times`) `Lead times`,sum(`Stock Levels`) as `Stock levels`,sum(`Availability`) as Availability
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[24]:

Lead times	Stock levels	Availability
1596	4777	4840

Task 14: Analysis of Most Common Transportation Modes ¶

We're identifying the transportation modes most frequently utilized in our supply chain operations. This analysis helps us understand the preferred methods of transportation for moving goods, allowing us to optimize logistics strategies and improve efficiency. By knowing the most common transportation modes, we can make informed decisions to streamline transportation processes and reduce costs.

In [26]:
```
%%sql
select max(`transportation modes`)
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[26]:

max(`transportation modes`)
Sea

Task 15: Analysis of Transportation Modes' Impact on Lead Time and Cost

We're examining the influence of transportation modes on lead time and cost in our supply chain. This analysis helps us understand the relationship between different transportation methods and their impact on the time it takes for goods to reach their destination and the associated costs. By analyzing this data, we can optimize transportation strategies to minimize lead times and reduce expenses.

In [27]:
```
%%sql
select `transportation modes`,sum(`Lead times`),round(sum(costs),2)
from chain
group by `transportation modes`
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
4 rows affected.
```

Out[27]:

transportation modes	sum(`Lead times`)	round(sum(costs),2)
Road	497	16048.19
Air	475	14604.53
Rail	417	15168.93
Sea	207	7102.93

Task 16: Analysis of Most Commonly Used Routes

We're identifying the routes that are most frequently used for transporting goods in our supply chain. This analysis helps us understand the preferred pathways for moving products between locations, enabling us to optimize route planning and logistics operations. By knowing the most common routes, we can ensure efficient transportation of goods and minimize delays in delivery.

In [28]:
```
%%sql

select max(`Routes`)
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[28]:

max(`Routes`)
Route C

Task 17: Analysis of Route Impact on Costs and Lead Times

We're investigating the effect of different transportation routes on costs and lead times in our supply chain. This analysis helps us understand the relationship between route choices and their impact on the time it takes for goods to be delivered and the associated costs. By examining this data, we can optimize route selection to minimize lead times and reduce transportation expenses.

In [32]:
```
%%sql
select Routes,sum(`lead times`)total_lead,round(sum(`costs`),2) Costs
from chain
group by Routes
order by Routes
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[32]:

Routes	total_lead	Costs
Route A	632	20875.77
Route B	637	22039.38
Route C	327	10009.42

Task 18: Average Defect Rate Analysis by Product

We're calculating the average defect rate for each product type to assess the quality performance of our products. This analysis helps us identify which product types have higher or lower defect rates, allowing us to focus on improving quality control measures where necessary. By understanding the average defect rate for each product type, we can implement targeted quality improvement initiatives to enhance overall product quality.

In [33]:
```
%%sql
select `product type`,round(sum(`Defect rates`)/count(`Defect rates`),2) defectrates
from chain
group by `product type`
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
3 rows affected.
```

Out[33]:

product type	defectrates
haircare	2.48
skincare	2.33
cosmetics	1.92

Task 20: Analysis of Production Volume's Relationship with Stock Levels and Order Quantities

We're examining the relationship between production volume, stock levels, and order quantities to understand how changes in production affect inventory levels and customer demand. This analysis helps us optimize production planning and inventory management to ensure adequate stock levels to meet customer orders. By understanding the relationship between production volume, stock levels, and order quantities, we can streamline operations and improve efficiency in our supply chain

In [35]:
```
%%sql
select sum(`production volumes`),sum(`Stock levels`),sum(`Order quantities`)
from chain
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
1 rows affected.
```

Out[35]:

sum(`production volumes`)	sum(`Stock levels`)	sum(`Order quantities`)
56784	4777	4922

Task 21: Alignment of Production Volumes with Market Demands

We're assessing the alignment of production volumes with market demands in each location to ensure that we are effectively meeting customer needs. This analysis helps us understand if our production levels are appropriately matched to the demand for our products in different areas. By evaluating the alignment of production volumes with market demands, we can adjust our production strategies to better serve our customers and optimize sales opportunities.

In [37]:
```
%%sql
select location,round(sum(`production volumes`),2)
from chain
group by location
order by location  desc
```

```
 * mysql+pymysql://bc3ffa0e:***@localhost/bc3ffa0e
5 rows affected.
```

Out[37]:

location	round(sum(`production volumes`),2)
Mumbai	13160
Kolkata	15451
Delhi	8362
Chennai	11984
Bangalore	7827