

## Product Analysis SQL Queries

### 1. Product Performance:

#### Q1: Total Sales Quantity by Region and Product Category (Aggregation and Join)

```
SELECT
    S.Region,
    P.Category,
    SUM(S.QuantitySold) AS Total_Quantity_Sold
FROM
    Sales S
INNER JOIN
    Products P ON S.ProductID = P.ProductID
GROUP BY
    S.Region, P.Category
ORDER BY
    S.Region, Total_Quantity_Sold DESC;
```

Region	Category	Total_Quantity_Sold
Central India	Clothing	1112
Central India	Electronics	1087
Central India	Stationery	762
Central India	Kitchen Appliances	723
Central India	Furniture	608
East India	Electronics	929
East India	Stationery	868
East India	Clothing	827
East India	Kitchen Appliances	681
East India	Furniture	473
North India	Clothing	997
North India	Electronics	955
North India	Stationery	836
North India	Kitchen Appliances	801
North India	Furniture	470
South India	Stationery	1004
South India	Clothing	909
South India	Electronics	769
South India	Kitchen Appliances	677
South India	Furniture	494
West India	Stationery	998
West India	Kitchen Appliances	820
West India	Electronics	756
West India	Clothing	744
West India	Furniture	309

#### 4: Product Margin by Category

```
SELECT
  p.Category,
  COUNT(s.SaleID) AS TotalTransactions,
  SUM(s.QuantitySold * s.SalePrice_INR) AS TotalRevenue_INR,
  -- Total Margin Calculation
  SUM(s.QuantitySold * (s.SalePrice_INR - p.UnitPrice_INR)) AS TotalMargin_INR,
  -- Average Margin Percentage
  ROUND(
    (SUM(s.QuantitySold * (s.SalePrice_INR - p.UnitPrice_INR)) * 100.0) /
    SUM(s.QuantitySold * s.SalePrice_INR),
    2) AS AvgMarginPercentage
FROM sales s
JOIN products p ON s.ProductID = p.ProductID
GROUP BY p.Category
ORDER BY TotalMargin_INR DESC;
```

Category	TotalTransactions	TotalRevenue_INR	TotalMargin_INR	AvgMarginPercentage
Stationery	342	133779629.71	15964108.08	11.93
Kitchen Appliances	280	110146123.61	14410242.01	13.08
Electronics	354	134021633.06	6107385.92	4.56
Furniture	180	71477089.24	-6366315.45	-8.91
Clothing	344	124230231.80	-45373261.89	-36.52

## Top-Selling and Least-Selling Products Across Different Regions

### 2.a Top 3 Selling Products by Quantity per Region

```
WITH RankedSales AS (  
    SELECT  
        s.Region,  
        s.ProductID,  
        p.ProductName,  
        SUM(s.QuantitySold) AS TotalQuantitySold,  
        ROW_NUMBER() OVER (PARTITION BY s.Region ORDER BY SUM(s.QuantitySold) DESC) as rn  
    FROM sales s  
    JOIN products p ON s.ProductID = p.ProductID  
    GROUP BY 1, 2, 3  
)  
SELECT  
    Region,  
    ProductID,  
    ProductName,  
    TotalQuantitySold  
FROM RankedSales  
WHERE rn <= 3  
ORDER BY Region, TotalQuantitySold DESC;
```

Region	ProductID	ProductName	TotalQuantitySold
Central India	P012	Hic Clothing	111
Central India	P065	Numquam Furniture	110
Central India	P061	Fugiat Stationery	104
East India	P023	Odit Clothing	93
East India	P017	Doloribus Furniture	83
East India	P071	Provident Electronics	77
North India	P087	Fuga Clothing	106
North India	P082	Qui Kitchen	104
North India	P026	Nulla Electronics	100
South India	P007	Odio Stationery	134
South India	P107	Quibusdam Stationery	89
South India	P061	Fugiat Stationery	87
West India	P118	Exercitationem Stati...	117
West India	P047	Rerum Kitchen	107
West India	P007	Odio Stationery	103



### 3. Least 3 Selling Products by Revenue per Region

```
WITH RegionalRevenue AS (  
  SELECT  
    s.Region,  
    s.ProductID,  
    p.ProductName,  
    SUM(s.QuantitySold * s.SalePrice_INR) AS TotalRevenue,  
    ROW_NUMBER() OVER (PARTITION BY s.Region ORDER BY SUM(s.QuantitySold * s.SalePrice_INR)  
      ASC) as rn  
  FROM sales s  
  JOIN products p ON s.ProductID = p.ProductID  
  GROUP BY 1, 2, 3  
)  
SELECT  
  Region,  
  ProductID,  
  ProductName,  
  TotalRevenue  
FROM RegionalRevenue  
WHERE rn <= 3  
ORDER BY Region, TotalRevenue ASC;
```

Region	ProductID	ProductName	TotalRevenue
Central India	P066	Perspiciatis Kitchen	3080.60
Central India	P090	Ratione Electronics	26623.26
Central India	P085	Nobis Clothing	30232.59
East India	P054	Esse Kitchen	22286.67
East India	P084	Magni Kitchen	25089.00
East India	P072	Culpa Electronics	42005.39
North India	P044	Sequi Electronics	4690.80
North India	P027	Consectetur Electronics	7239.49
North India	P004	Odit Electronics	27385.60
South India	P092	Similique Electronics	18792.91
South India	P036	Accusamus Furniture	35030.88
South India	P063	Quam Electronics	61116.70
West India	P107	Quibusdam Stationery	19925.38
West India	P063	Quam Electronics	27165.17
West India	P069	Incidunt Clothing	30628.90

#### 4.Low Stock Alert: Products whose StockLevel is less than or equal to their ReorderLevel (Join and Filter)

```
SELECT
    I.ProductID,
    P.ProductName,
    I.StockLevel,
    I.ReorderLevel,
    I.WarehouseLocation
FROM
    Inventory I
INNER JOIN
    Products P ON I.ProductID = P.ProductID
WHERE
    I.StockLevel <= I.ReorderLevel
ORDER BY
    I.StockLevel ASC;
```

ProductID	ProductName	StockLevel	ReorderLevel	WarehouseLocation
P025	Neque Clothing	1	108	Ahmedabad Warehouse
P094	Sequi Clothing	3	129	Bengaluru Warehouse
P058	Repellat Electronics	6	84	Chennai Warehouse
P097	Illum Clothing	13	147	Bengaluru Warehouse
P081	Tempore Electronics	14	107	Chennai Warehouse
P045	Amet Electronics	27	28	Lucknow Warehouse
P039	Possimus Stationery	29	113	Bengaluru Warehouse
P047	Rerum Kitchen	31	67	Bengaluru Warehouse
P023	Odit Clothing	44	141	Hyderabad Warehouse
P114	Accusantium Electronics	46	65	Ahmedabad Warehouse
P055	Unde Clothing	50	125	Jaipur Warehouse
P065	Numquam Furniture	51	105	Delhi Warehouse
P051	Et Electronics	61	121	Bengaluru Warehouse
P108	Quisquam Furniture	65	143	Delhi Warehouse
P017	Doloribus Furniture	71	120	Jaipur Warehouse
P086	Doloribus Clothing	87	110	Delhi Warehouse
P087	Fuga Clothing	103	134	Lucknow Warehouse
P008	Expedita Electronics	129	135	Jaipur Warehouse

## 5: Total Sales Quantity by Region and Product Category (Aggregation and Join)

```
SELECT
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    P.Category,
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FROM
    Sales S
INNER JOIN
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GROUP BY
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ORDER BY
    S.Region, Total_Quantity_Sold DESC;
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East India	Stationery	868
East India	Clothing	827
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East India	Furniture	473
North India	Clothing	997
North India	Electronics	955
North India	Stationery	836
North India	Kitchen Appliances	801
North India	Furniture	470
South India	Stationery	1004
South India	Clothing	909
South India	Electronics	769
South India	Kitchen Appliances	677
South India	Furniture	494
West India	Stationery	998
West India	Kitchen Appliances	820
West India	Electronics	756
West India	Clothing	744
West India	Furniture	309



## 6: Average Discount per Region and its Effect on Average Revenue per Transaction

```
SELECT
  Region,
  ROUND(AVG(DiscountApplied) * 100, 2) AS AvgDiscountPercentage,
  COUNT(SaleID) AS TotalTransactions,
  ROUND(AVG(QuantitySold * SalePrice_INR), 2) AS AvgTransactionRevenue
FROM sales
GROUP BY Region
ORDER BY AvgTransactionRevenue DESC;
```

Region	AvgDiscountPercentage	TotalTransactions	AvgTransactionRevenue
South India	9.81	277	406230.38
Central India	10.01	332	386843.34
East India	9.80	294	377165.40
North India	10.38	308	377099.88
West India	10.40	289	365617.70

## Customer Segmentation

### 7: Top 10 Most Valuable Customers (Revenue)

```
SELECT
  c.CustomerID,
  c.Name,
  c.Location,
  c.LoyaltyScore,
  SUM(s.QuantitySold * s.SalePrice_INR) AS TotalRevenueGenerated
FROM sales s
JOIN customers c ON s.CustomerID = c.CustomerID
GROUP BY 1, 2, 3, 4
ORDER BY TotalRevenueGenerated DESC
LIMIT 10;
```

CustomerID	Name	Location	LoyaltyScore	TotalRevenueGenerated
C091	Tarini Doctor	Ahmedabad	74	5631311.53
C135	Eva Chowdhury	Kolkata	0	5474276.61
C139	Zeeshan Rau	Chennai	53	5325129.74
C094	Priyansh Contractor	Lucknow	22	4896828.15
C243	Saanvi Loke	Kolkata	14	4646519.78
C254	Vivaan Rastogi	Delhi	89	4534060.33
C273	Tejas Ramesh	Ahmedabad	27	4523423.59
C068	Yashvi Borah	Lucknow	4	4455115.96
C049	Mohanlal Rege	Kolkata	52	4399923.38
C007	Romil Dasgupta	Chennai	9	4197731.35



## Marketing Campaign Performance

### 8.Campaign Performance by Total Revenue Generated

```

SELECT
    m.CampaignID,
    p.ProductName,
    m.Budget_INR,
    m.ConversionRate,
    SUM(s.QuantitySold * s.SalePrice_INR) AS TotalRevenueGenerated
FROM marketing m
JOIN products p ON m.ProductID = p.ProductID
JOIN sales s ON m.ProductID = s.ProductID
GROUP BY 1, 2, 3, 4
ORDER BY TotalRevenueGenerated DESC;

```

CampaignID	ProductName	Budget_INR	ConversionRate	TotalRevenueGenerated
M026	Cumque Electronics	406784	0.05	9477635.63
M022	Aut Clothing	530601	0.16	6541677.33
M002	Rerum Kitchen	549208	0.15	6399413.48
M013	Rerum Kitchen	113001	0.14	6399413.48
M015	Esse Furniture	111147	0.07	6272160.70
M012	Fuga Clothing	470522	0.15	6007610.12
M040	Voluptatum Kitchen	488499	0.18	5956419.32
M038	Voluptatum Kitchen	349110	0.09	5956419.32
M020	Nisi Kitchen	328237	0.08	5925147.18
M001	Quam Electronics	103822	0.17	5439187.60
M018	Similique Stationery	177773	0.11	5409631.22
M039	Numquam Electronics	449793	0.13	5396464.73
M009	Harum Kitchen	573880	0.11	5214616.13
M037	Cum Stationery	384084	0.17	5181686.78
M034	Consequatur Stati...	386309	0.05	5096906.05
M024	Sint Stationery	118781	0.19	5094570.49
M021	Exercitationem Sta...	158214	0.18	4876956.71
M005	Voluptates Electro...	563693	0.17	4853431.56
M035	Minima Clothing	166969	0.16	4827260.97
M036	Minima Clothing	216474	0.12	4827260.97
M016	Voluptates Kitchen	266177	0.20	4804138.19
M017	Harum Clothing	531717	0.15	4595446.46
M014	Voluptatum Statio...	289147	0.20	4525127.16
M032	Voluptatum Statio...	223280	0.12	4525127.16
M008	Cumque Electronics	415154	0.19	4522315.66
M023	Sequi Clothing	594866	0.16	4515088.34
M006	Nulla Electronics	112450	0.13	4483032.13
M033	Placeat Furniture	209594	0.13	4149735.78
M010	Omnis Furniture	374799	0.13	3807282.86
M028	Commodi Clothing	92321	0.14	3674987.25
M027	Doloremque Kitchen	530418	0.05	3193001.45
M031	Fugit Electronics	326866	0.04	3177700.12
M025	Esse Kitchen	556825	0.04	2904397.78
M003	Consectetur Electr...	111702	0.15	2893797.05
M029	Possimus Furniture	451461	0.09	2818258.58
M007	Ratione Electronics	425261	0.11	2803256.18
M019	Magni Kitchen	93465	0.13	2598534.39
M030	Nobis Clothing	538004	0.18	2428141.35

## 9: Campaign ROI (Revenue to Budget Ratio)

WITH CampaignRevenue AS (

SELECT

m.CampaignID,

SUM(s.QuantitySold \* s.SalePrice\_INR) AS TotalRevenueGenerated

FROM marketing m

JOIN sales s ON m.ProductID = s.ProductID

GROUP BY 1

)

SELECT

m.CampaignID,

m.Budget\_INR,

cr.TotalRevenueGenerated,

-- Calculate ROI: (Revenue / Budget)

ROUND(cr.TotalRevenueGenerated / m.Budget\_INR, 2) AS RevenueToBudgetRatio

FROM marketing m

JOIN CampaignRevenue cr ON m.CampaignID = cr.CampaignID

ORDER BY RevenueToBudgetRatio DESC;

CampaignID	Budget_INR	TotalRevenueGenerated	RevenueToBudgetRatio
M013	113001	6399413.48	56.63
M015	111147	6272160.70	56.43
M001	103822	5439187.60	52.39
M024	118781	5094570.49	42.89
M006	112450	4483032.13	39.87
M028	92321	3674987.25	39.81
M021	158214	4876956.71	30.83
M018	177773	5409631.22	30.43
M035	166969	4827260.97	28.91
M019	93465	2598534.39	27.80
M003	111702	2893797.05	25.91
M026	406784	9477635.63	23.30
M036	216474	4827260.97	22.30
M032	223280	4525127.16	20.27
M033	209594	4149735.78	19.80
M004	100192	1880498.28	18.77
M020	328237	5925147.18	18.05
M016	266177	4804138.19	18.05
M038	349110	5956419.32	17.06
M014	289147	4525127.16	15.65
M037	384084	5181686.78	13.49
M034	386309	5096906.05	13.19
M012	470522	6007610.12	12.77
M022	530601	6541677.33	12.33
M040	488499	5956419.32	12.19
M039	449793	5396464.73	12.00
M002	549208	6399413.48	11.65
M008	415154	4522315.66	10.89
M010	374799	3807282.86	10.16
M031	326866	3177700.12	9.72
M009	573880	5214616.13	9.09
M017	531717	4595446.46	8.64
M005	563693	4853431.56	8.61
M023	594866	4515088.34	7.59
M007	425261	2803256.18	6.59
M029	451461	2818258.58	6.24
M027	530418	3193001.45	6.02
M011	374059	2003543.11	5.36
M025	556825	2904397.78	5.22

Supplier Performance: Total Net Revenue for products supplied by each supplier (Join and Aggregation)

```
SELECT
    P.Supplier,
    SUM(S.QuantitySold * S.SalePrice_INR * (1 - S.DiscountApplied)) AS Total_Net_Revenue
FROM
    Sales S
INNER JOIN
    Products P ON S.ProductID = P.ProductID
GROUP BY
    P.Supplier
ORDER BY
    Total_Net_Revenue DESC;
```

Supplier	Total_Net_Revenue
Elite Goods	143334814.4853
Electro India	129526377.4934
Bharat Tech	95192642.9163
Comfort Solutions	81864284.1060
Urban Furnish	66399313.8447



### Top 5 Product Categories by Net Revenue and their Gross Margin %

```
SELECT
    P.Category,
    SUM(S.QuantitySold * S.SalePrice_INR * (1 - S.DiscountApplied)) AS Net_Revenue,
    SUM(S.QuantitySold * (S.SalePrice_INR * (1 - S.DiscountApplied) - (P.UnitPrice_INR * 0.8))) AS
Gross_Margin,
    (SUM(S.QuantitySold * (S.SalePrice_INR * (1 - S.DiscountApplied) - (P.UnitPrice_INR * 0.8))) /
SUM(S.QuantitySold * S.SalePrice_INR * (1 - S.DiscountApplied))) * 100 AS Gross_Margin_Percentage
FROM
    Sales S
INNER JOIN
    Products P ON S.ProductID = P.ProductID
GROUP BY
    P.Category
ORDER BY
    Net_Revenue DESC
LIMIT 5;
```

Category	Net_Revenue	Gross_Margin	Gross_Margin_Percentage
Electronics	120967211.4537	18635813.7417	15.40567359
Stationery	119593419.9952	25341002.6912	21.18929511
Clothing	111313203.7565	-24369591.1955	-21.89281269
Kitchen Appliances	99156824.2577	22568118.9777	22.76002600
Furniture	65286773.3826	3012049.6306	4.61356792