

Sales Data Analysis

1. Database and Table Setup

We created a relational database named `Sales` and defined a table `sales_data` with the following fields:

- Product details: `Product_ID`, `Product_Category`, `Unit_Cost`, `Unit_Price`
- Sales transaction details: `Sale_Date`, `Sales_Rep`, `Region`, `Sales_Amount`, `Quantity_Sold`, `Discount`
- Customer and channel details: `Customer_Type`, `Payment_Method`, `Sales_Channel`, `Region_and_Sales_Rep`

```
1 -- Create database "Sales"
```

```
2 create database Sales;
```

```
3 use Sales;
```

```
4
```

```
5 -- Create table Sales_data;
```

```
6 CREATE TABLE sales_data (  
7     Product_ID INT,  
8     Sale_Date DATE,  
9     Sales_Rep VARCHAR(50),  
10    Region VARCHAR(50),  
11    Sales_Amount DECIMAL(10,2),  
12    Quantity_Sold INT,  
13    Product_Category VARCHAR(50),  
14    Unit_Cost DECIMAL(10,2),  
15    Unit_Price DECIMAL(10,2),  
16    Customer_Type VARCHAR(50),  
17    Discount DECIMAL(5,2),  
18    Payment_Method VARCHAR(50),  
19    Sales_Channel VARCHAR(50),  
20    Region_and_Sales_Rep VARCHAR(100)  
21 );
```

```
• describe Sales_data;
```

Field	Type	Null	Key	Default	Extra
Product_ID	int	YES		NULL	
Sale_Date	text	YES		NULL	
Sales_Rep	text	YES		NULL	
Region	text	YES		NULL	
Sales_Amount	double	YES		NULL	
Quantity_Sold	int	YES		NULL	
Product_Category	text	YES		NULL	
Unit_Cost	double	YES		NULL	
Unit_Price	double	YES		NULL	
Customer_Type	text	YES		NULL	
Discount	double	YES		NULL	
Payment_Method	text	YES		NULL	
Sales_Channel	text	YES		NULL	

Retrieve all records from the sales data:

```
27 • select * from Sales_data;
```

```
28
```

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel
1052	2023-02-03	Bob	North	5053.97	18	Furniture	152.75	267.22	Returning	0.09	Cash	Online
109	2023-04-21	Bob	West	4384.02	17	Furniture	3816.39	4209.44	Returning	0.11	Cash	Retail
1015	2023-09-21	David	South	4631.23	30	Food	261.56	371.4	Returning	0.2	Bank Transfer	Retail
1072	2023-08-24	Bob	South	2167.94	39	Clothing	4330.03	4467.75	New	0.02	Credit Card	Retail
1061	2023-03-24	Charlie	East	3750.2	13	Electronics	637.37	692.71	New	0.08	Credit Card	Online
1021	2023-02-11	Charlie	West	3761.15	32	Food	900.79	1106.51	New	0.21	Cash	Online
1083	2023-04-11	Bob	West	618.31	29	Furniture	2408.81	2624.09	Returning	0.14	Cash	Online
1087	2023-01-06	Eve	South	7698.92	46	Furniture	3702.51	3964.65	New	0.12	Bank Transfer	Online
1075	2023-06-29	David	South	4223.39	30	Furniture	738.06	1095.4499999999998	New	0.05	Bank Transfer	Online
1075	2023-10-09	Charlie	West	8239.58	18	Clothing	2228.35	2682.34	New	0.13	Bank Transfer	Online

Show all distinct Product_Category:

```
30 • select distinct Product_category from Sales_data;
31
```

Product_category
Furniture
Food
Clothing
Electronics

Display sales made by Sales_Rep = 'Bob':

```
33 • select * from Sales_data where Sales_Rep = 'Bob';
34
```

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel
1052	2023-02-03	Bob	North	5053.97	18	Furniture	152.75	267.22	Returning	0.09	Cash	Online
1093	2023-04-21	Bob	West	4384.02	17	Furniture	3816.39	4209.44	Returning	0.11	Cash	Retail
1072	2023-08-24	Bob	South	2167.94	39	Clothing	4330.03	4467.75	New	0.02	Credit Card	Retail
1083	2023-04-11	Bob	West	618.31	29	Furniture	2408.81	2624.09	Returning	0.14	Cash	Online
1100	2023-08-14	Bob	West	2198.74	43	Food	1100.81	1137.44	Returning	0.08	Bank Transfer	Online
1053	2023-10-16	Bob	North	2235.83	48	Furniture	121.19	487.65	New	0.18	Cash	Retail
1088	2023-10-04	Bob	East	6116.75	40	Electronics	4904.93	5034.35	New	0.1	Credit Card	Retail
1038	2023-03-11	Bob	South	1452.35	15	Clothing	2543.36	2790.1000000000004	Returning	0.07	Cash	Online
1089	2023-11-07	Bob	West	2945.36	47	Furniture	4157.62	4314.5599999999995	New	0.17	Bank Transfer	Retail
1060	2023-08-17	Bob	East	8371.25	16	Clothing	3975.99	4422.59	New	0.24	Cash	Online
1064	2023-05-14	Bob	South	5356.28	8	Electronics	4271.99	4417.79	Returning	0.04	Cash	Online
1051	2023-04-04	Bob	East	198.25	12	Electronics	3544.48	3723.66	Returning	0.19	Cash	Online

Get top 5 highest Sales_Amount values:

```
36 • select * from Sales_data order by Sales_Amount limit 5;
37
```

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel
1070	2023-12-13	Alice	West	100.12	8	Clothing	3762.27	4166.95	Returning	0.16	Bank Transfer	Online
1064	2023-12-19	Alice	West	106.47	35	Clothing	4900.03	5118.83	Returning	0.07	Credit Card	Retail
1078	2023-11-16	David	East	113.4	8	Furniture	3459.61	3657.23	Returning	0.03	Bank Transfer	Online
1067	2023-06-29	Eve	South	114.59	48	Food	4319.32	4625.5599999999995	Returning	0.1	Bank Transfer	Online
1087	2023-09-08	Charlie	North	119.72	20	Clothing	193.27	297.69	New	0.22	Cash	Online

Find all records where the Discount is more than 0.10:

39 • `select * from Sales_data where Discount > 0.10;`

40

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel	Region
1093	2023-04-21	Bob	West	4384.02	17	Furniture	3816.39	4209.44	Returning	0.11	Cash	Retail	West-Bo
1015	2023-09-21	David	South	4631.23	30	Food	261.56	371.4	Returning	0.2	Bank Transfer	Retail	South-D
1021	2023-02-11	Charlie	West	3761.15	32	Food	900.79	1106.51	New	0.21	Cash	Online	West-Ch
1083	2023-04-11	Bob	West	618.31	29	Furniture	2408.81	2624.09	Returning	0.14	Cash	Online	West-Bo
1087	2023-01-06	Eve	South	7698.92	46	Furniture	3702.51	3964.65	New	0.12	Bank Transfer	Online	South-E
1075	2023-10-09	Charlie	West	8239.58	18	Clothing	2228.35	2682.34	New	0.13	Bank Transfer	Online	West-Ch
1088	2023-11-16	Eve	North	8518.45	13	Furniture	2440.11	2517.6	New	0.23	Bank Transfer	Retail	North-E
1003	2023-12-31	Alice	South	4775.59	30	Furniture	4190.28	4270.65	New	0.2	Cash	Online	South-Al
1022	2023-08-17	Charlie	South	8813.55	21	Food	2537.2	2869.6	New	0.29	Bank Transfer	Retail	South-Ch
1053	2023-10-16	Bob	North	2235.83	48	Furniture	121.19	487.65	New	0.18	Cash	Retail	North-B
1030	2023-07-17	David	West	3023.48	19	Clothing	3049.33	3209.22	Returning	0.26	Cash	Online	West-D
1002	2023-04-22	Eve	North	6551.23	9	Electronics	4398.16	4439.12	New	0.18	Bank Transfer	Online	North-E

Get sales from the South region:

42 • `select * from Sales_data where Region='South';`

43

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel	Region
1015	2023-09-21	David	South	4631.23	30	Food	261.56	371.4	Returning	0.2	Bank Transfer	Retail	South-D
1072	2023-08-24	Bob	South	2167.94	39	Clothing	4330.03	4467.75	New	0.02	Credit Card	Retail	South-B
1087	2023-01-06	Eve	South	7698.92	46	Furniture	3702.51	3964.65	New	0.12	Bank Transfer	Online	South-E
1075	2023-06-29	David	South	4223.39	30	Furniture	738.06	1095.4499999999998	New	0.05	Bank Transfer	Online	South-D
1003	2023-12-31	Alice	South	4775.59	30	Furniture	4190.28	4270.65	New	0.2	Cash	Online	South-Al
1022	2023-08-17	Charlie	South	8813.55	21	Food	2537.2	2869.6	New	0.29	Bank Transfer	Retail	South-Ch
1038	2023-03-11	Bob	South	1452.35	15	Clothing	2543.36	2790.1000000000004	Returning	0.07	Cash	Online	South-B
1021	2023-11-27	Alice	South	6483.84	31	Furniture	2254.99	2441.79	Returning	0.24	Bank Transfer	Online	South-Al
1033	2023-11-14	David	South	4011.8	23	Furniture	2981.5	3360.4	Returning	0.22	Bank Transfer	Retail	South-D
1091	2023-09-04	Charlie	South	675.11	44	Food	2085.46	2406.58	Returning	0.06	Bank Transfer	Retail	South-E
1080	2023-02-05	Charlie	South	245.46	9	Electronics	1141.52	1550.19	New	0.28	Credit Card	Retail	South-Ch
1064	2023-05-14	Bob	South	5356.28	8	Electronics	4271.99	4417.79	Returning	0.04	Cash	Online	South-B

List all Sales_Rep who handled Electronics category:

45 • `select distinct Sales_Rep from Sales_data where Product_category='Electronics';`

46

Sales_Rep
Charlie
Bob
Eve
David
Alice

Get all records with Customer_Type = 'New' and Discount < 0.05:

48 • `select * from Sales_data where Customer_Type = 'New' and Discount < 0.5;`

49

Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel	Region
1072	2023-08-24	Bob	South	2167.94	39	Clothing	4330.03	4467.75	New	0.02	Credit Card	Retail	South-B
1061	2023-03-24	Charlie	East	3750.2	13	Electronics	637.37	692.71	New	0.08	Credit Card	Online	East-Ch
1021	2023-02-11	Charlie	West	3761.15	32	Food	900.79	1106.51	New	0.21	Cash	Online	West-Ch
1087	2023-01-06	Eve	South	7698.92	46	Furniture	3702.51	3964.65	New	0.12	Bank Transfer	Online	South-E
1075	2023-06-29	David	South	4223.39	30	Furniture	738.06	1095.4499999999998	New	0.05	Bank Transfer	Online	South-D
1075	2023-10-09	Charlie	West	8239.58	18	Clothing	2228.35	2682.34	New	0.13	Bank Transfer	Online	West-Ch
1088	2023-11-16	Eve	North	8518.45	13	Furniture	2440.11	2517.6	New	0.23	Bank Transfer	Retail	North-E
1003	2023-12-31	Alice	South	4775.59	30	Furniture	4190.28	4270.65	New	0.2	Cash	Online	South-Al
1022	2023-08-17	Charlie	South	8813.55	21	Food	2537.2	2869.6	New	0.29	Bank Transfer	Retail	South-Ch
1053	2023-10-16	Bob	North	2235.83	48	Furniture	121.19	487.65	New	0.18	Cash	Retail	North-B
1088	2023-10-04	Bob	East	6116.75	40	Electronics	4904.93	5034.35	New	0.1	Credit Card	Retail	East-B
1002	2023-04-22	Eve	North	6551.23	9	Electronics	4398.16	4439.12	New	0.18	Bank Transfer	Online	North-E

Total Sales_Amount by region:

```

52 • select Region, Sum(Sales_Amount) as Total_sales
53   from Sales_data group by Region;
54

```

Region	Total_sales
North	1369612.510000001
West	1235608.9299999997
South	1154250.8600000006
East	1259792.93

Total sales and average discount for each Payment_Method:

```

56 • select Payment_Method, sum(Sales_Amount) as Total_sales , avg(Discount) as Avg_discount
57   from Sales_data group by Payment_Method;
58
59 -- Find the month with the highest total Sales_Amount.

```

Payment_Method	Total_sales	Avg_discount
Cash	1544338.54	0.1517252396166135
Bank Transfer	1717363.1699999997	0.1535087719298246
Credit Card	1757563.5199999998	0.15188405797101467

Find the month with the highest total Sales_Amount:

```

60 • SELECT MONTH(Sale_Date) AS Sale_Month, SUM(Sales_Amount) AS Monthly_Sales
61   FROM sales_data
62  GROUP BY MONTH(Sale_Date)
63  ORDER BY Monthly_Sales DESC
64  LIMIT 5;
65

```

Sale_Month	Monthly_Sales
1	495420.3700000001
11	467482.89999999985
10	460378.78000000014
8	443171.28
4	438992.61000000004

Show product-wise average unit cost and average unit price:

```

67 • SELECT Product_ID, AVG(Unit_Cost) AS Avg_Cost, AVG(Unit_Price) AS Avg_Price
68   FROM sales_data GROUP BY Product_ID;
69

```

Product_ID	Avg_Cost	Avg_Price
1052	2273.0266666666666	2562.0516666666667
1093	1971.7927272727268	2204.7327272727266
1015	2527.4370000000004	2686.232
1072	2160.4937499999996	2404.84
1061	2469.445	2736.650833333333
1021	2290.6440000000002	2602.6220000000003
1083	2424.93	2703.4525000000003
1087	2418.021	2603.95
1075	2775.0766666666673	3017.9366666666667
1088	3337.3466666666664	3576.5811111111116
1100	2084.4522222222222	2341.2988888888885
1024	2447.7842857142855	2666.898571428571
1003	2570.9841666666666	2778.8283333333334

Find Sales with Above-Average Discount:

```

71 • SELECT *
72 FROM sales_data
73 WHERE Discount > (
74     SELECT AVG(Discount) FROM sales_data
75 );
76

```

	Product_ID	Sale_Date	Sales_Rep	Region	Sales_Amount	Quantity_Sold	Product_Category	Unit_Cost	Unit_Price	Customer_Type	Discount	Payment_Method	Sales_Channel	Region
▶	1015	2023-09-21	David	South	4631.23	30	Food	261.56	371.4	Returning	0.2	Bank Transfer	Retail	South-Da
	1021	2023-02-11	Charlie	West	3761.15	32	Food	900.79	1106.51	New	0.21	Cash	Online	West-Ch
	1088	2023-11-16	Eve	North	8518.45	13	Furniture	2440.11	2517.6	New	0.23	Bank Transfer	Retail	North-Ev
	1003	2023-12-31	Alice	South	4775.59	30	Furniture	4190.28	4270.65	New	0.2	Cash	Online	South-All
	1022	2023-08-17	Charlie	South	8813.55	21	Food	2537.2	2869.6	New	0.29	Bank Transfer	Retail	South-Ch
	1053	2023-10-16	Bob	North	2235.83	48	Furniture	121.19	487.65	New	0.18	Cash	Retail	North-Bo
	1030	2023-07-17	David	West	3023.48	19	Clothing	3049.33	3209.22	Returning	0.26	Cash	Online	West-Da
	1002	2023-04-22	Eve	North	6551.23	9	Electronics	4398.16	4439.12	New	0.18	Bank Transfer	Online	North-Ev
	1021	2023-11-27	Alice	South	6483.84	31	Furniture	2254.99	2441.79	Returning	0.24	Bank Transfer	Online	South-All
	1033	2023-11-14	David	South	4011.8	23	Furniture	2981.5	3360.4	Returning	0.22	Bank Transfer	Retail	South-Da
	1076	2023-12-16	Eve	East	7160.75	30	Clothing	3519.63	3774.65	New	0.2	Credit Card	Retail	East-Eve
	1089	2023-11-07	Bob	West	2945.36	47	Furniture	4157.62	4314.55...	New	0.17	Bank Transfer	Retail	West-Bol

List Regions with Sales Above Overall Average:

```

78 • SELECT DISTINCT Region
79 FROM sales_data
80 WHERE Region IN (
81     SELECT Region
82     FROM sales_data
83     GROUP BY Region
84     HAVING AVG(Sales_Amount) > (
85         SELECT AVG(Sales_Amount) FROM sales_data
86     )
87 );
88
89

```

Region
▶ North
West
South

Conclusion:

This analysis provided insights into:

- Top-performing regions and sales reps
- Sales trends by month and category
- Customer behavior based on discounts and payment methods
- Regions with strong sales performance