DAY 2 – TIME-BASED SQL ANALYSIS

1.Objective of Day 2

The objective of Day 2 was to analyze sales and profit trends over time to understand business growth, profitability patterns, and seasonality.

2.Why Time-Based Analysis Is Important

Time-based analysis helps businesses:

- Identify growth or decline trends

- Understand seasonal demand

- Plan inventory and marketing strategies

- Measure long-term performance

3.SQL Analysis Performed

3.1 Year-wise Sales and Profit

```
SELECT
  YEAR(order_date) AS year,
  ROUND(SUM(sales),2) AS total_sales,
  ROUND(SUM(profit),2) AS total_profit
FROM orders
GROUP BY YEAR(order_date)
ORDER BY year;
```

year	total_sales	total_profit
2014	484247.56	49544.06
2015	470532.46	61618.69
2016	609205.86	81795.27
2017	733215.19	93439.77

3.2 Year-wise Profit Margin

```
SELECT
  YEAR(order_date) AS year,
  ROUND((SUM(profit)/SUM(sales))*100,2) AS profit_margin
FROM orders
GROUP BY YEAR(order_date)
ORDER BY year;
```

year	profit_margin
2014	10.23
2015	13.10
2016	13.43
2017	12.74

3.3 Monthly Sales Trend

```
SELECT
  MONTH(order_date) AS month,
  ROUND(SUM(sales),2) AS total_sales
FROM orders
GROUP BY MONTH(order_date)
ORDER BY month;
```

month	total_sales
1	161083.61
2	132721.37
3	220064.72
4	147031.30
5	166420.33
6	144883.51
7	161227.09
8	209964.35
9	248989.33
10	184356.41
11	271693.77
12	248765.28

3.4 Combined Year and Month Trend

```sql
SELECT
  YEAR(order_date) AS year,
  MONTH(order_date) AS month,
  ROUND(SUM(sales),2) AS total_sales
FROM orders
GROUP BY YEAR(order_date), MONTH(order_date)
ORDER BY year, month;
```

	year	month	total_sales
▶	2014	1	28953.71
	2014	2	12743.12
	2014	3	54801.96
	2014	4	24710.03
	2014	5	29639.84
	2014	6	29287.06
	2014	7	35341.23
	2014	8	37854.57
	2014	9	66110.20
	2014	10	34561.93
	2014	11	64817.60
	2014	12	65426.31
	2015	1	29347.37
	2015	2	20728.34
	2015	3	40876.63

Key Insights from Day 2

- Business growth is not linear.

- High sales years may not always have high profit margins.

- Seasonality plays a significant role in sales performance.

Business Recommendations

- Focus marketing efforts during high-performing months.

- Investigate low-margin years to reduce costs or discounts.

- Use time-based insights for forecasting and planning.

Key Learnings from Day 2

- Time-based analysis reveals trends not visible in overall totals.

- Profit margin analysis is crucial for sustainable growth.

- SQL GROUP BY with date functions is essential for analytics.