

SALES FORECASTING AND ANOMALY DETECTION

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Problem Statement

1. A retail organization wants to move from reactive reporting to predictive analytics. Management needs a solution to:
2. Forecast future sales
3. Detect unusual sales patterns (anomalies)
4. Identify risks and opportunities early
5. Due to increasing data volume, manual analysis is no longer sufficient.
6. Therefore, as an Advanced BI Analyst, the task is to build an AI-powered Power BI dashboard that can analyze historical trends, forecast sales, detect anomalies, and automatically generate insights for better decision-making.

Project Overview

Business Problem:

Traditional reports only explain past performance and fail to predict risks or opportunities in advance.

Solution:

Developed an interactive Power BI dashboard using:

Sales Forecasting to predict future trends

Anomaly Detection to identify unusual sales spikes or drops

Root Cause Analysis to find key drivers of performance

Key Features:

KPIs: Total Sales, YTD, LY, YoY %

Line charts for trend, forecast, and anomalies

Decomposition Tree for root cause analysis

Slicers for dynamic filtering

Main Page

Sales Forecasting & Anomaly Detection (AI Project)

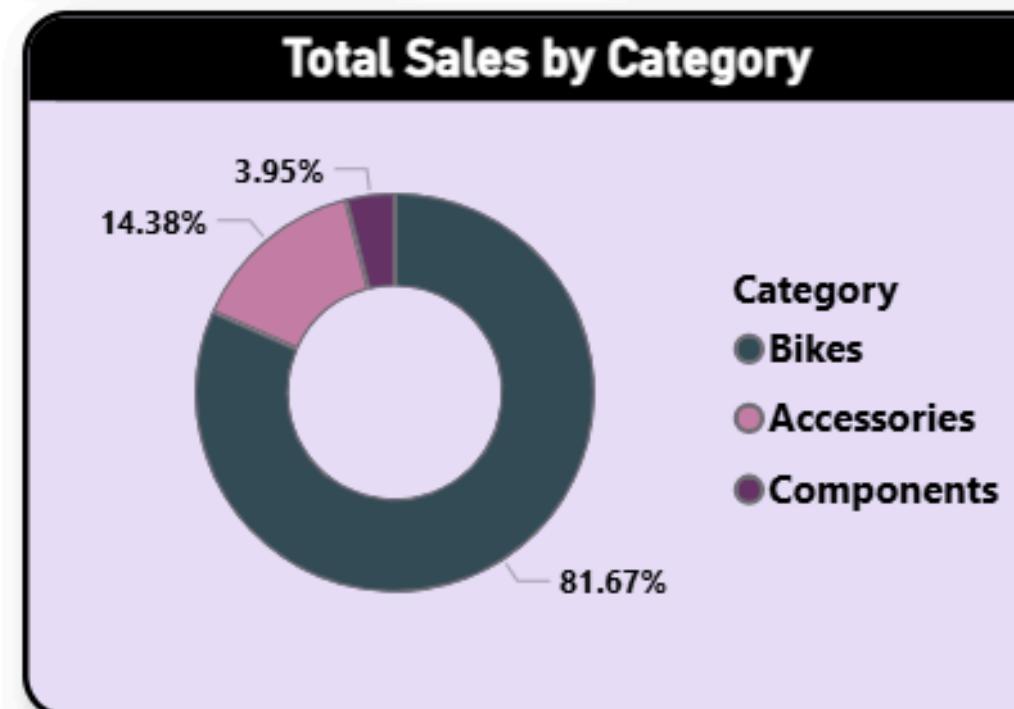
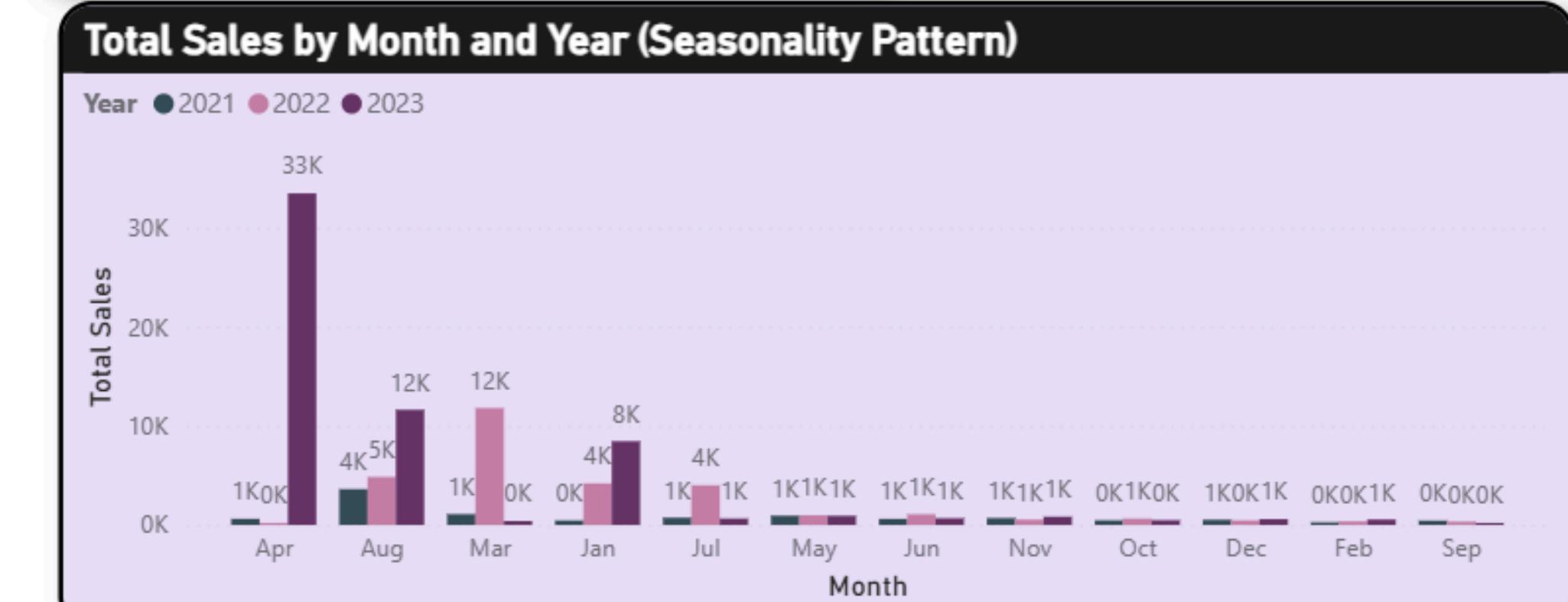
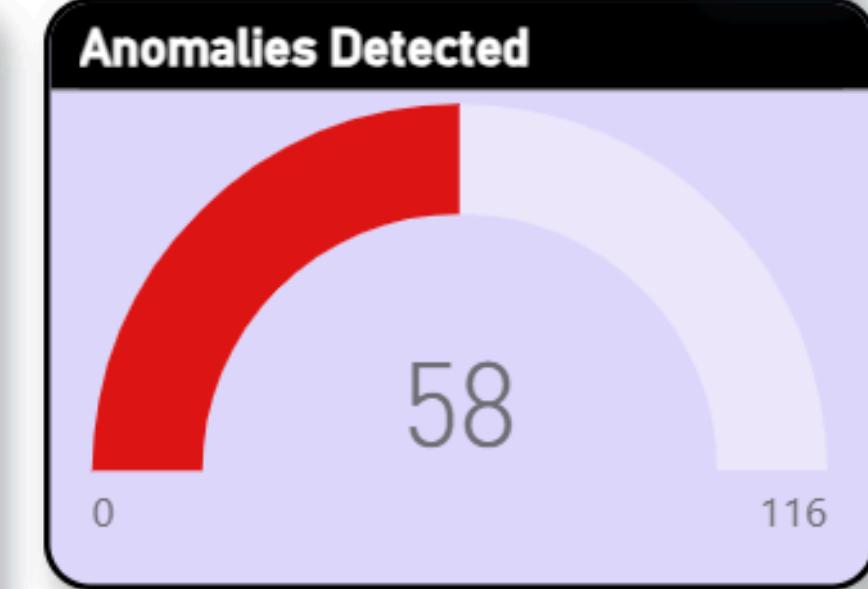
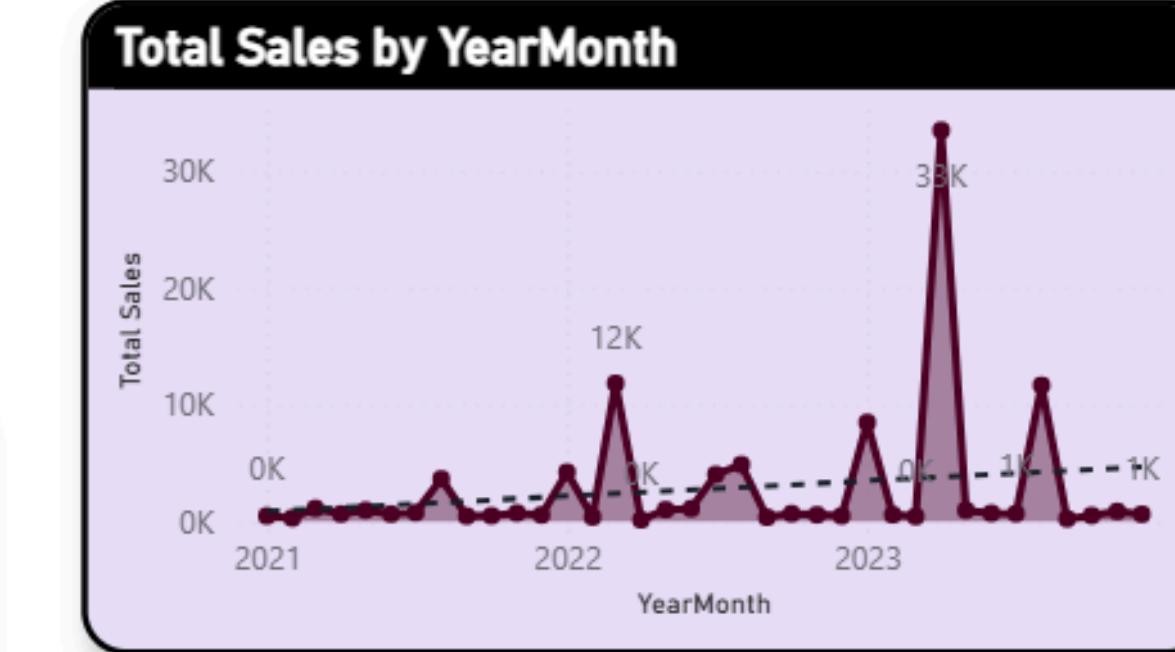
Next

98.80K
Total Sales

39.89K
Sales LY

58.91K
Sales YTD

1.48
YoY %

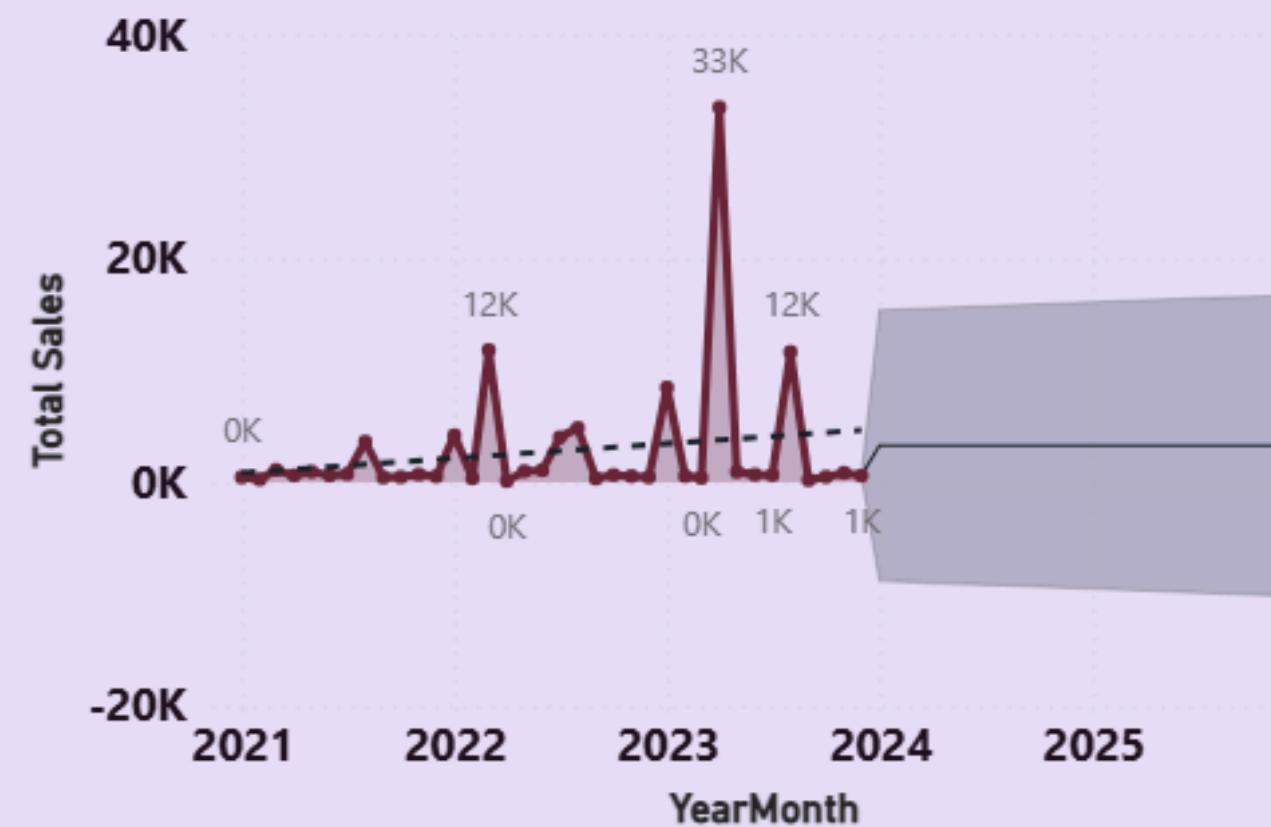




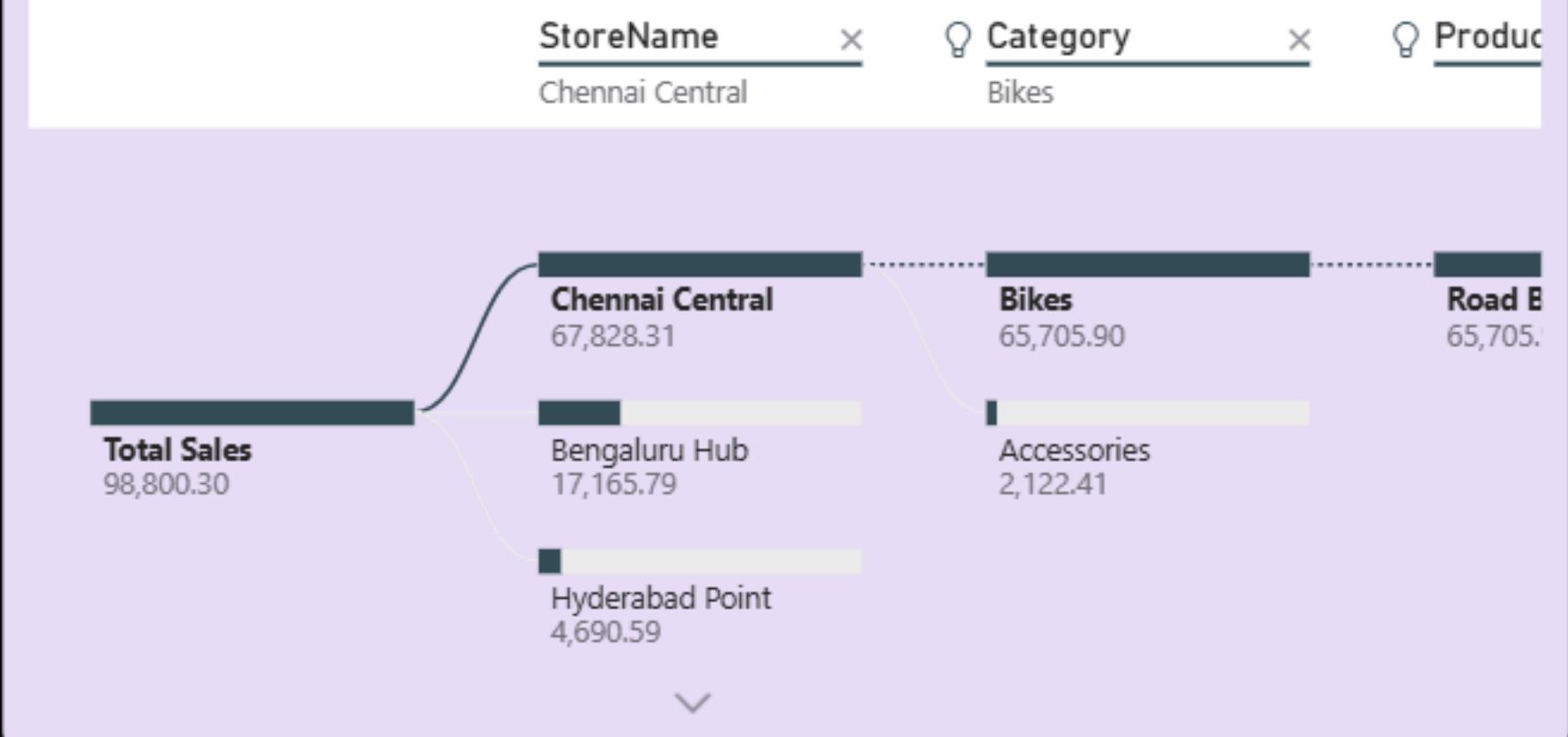
Sales Forecasting & Anomaly Detection

Next

Total Sales by YearMonth (Forecasting)



Root Cause



Forecast Reliability

The forecast model reliability is indicated by the confidence interval shown in the forecast chart. If the confidence band is **narrow**, the forecast is **more reliable** because sales patterns are consistent. If the band is **wide**, the forecast is **less reliable** because sales shows more fluctuations and uncertainty. In our dashboard, we used a **95% confidence interval**, so the forecast is statistically dependable within that range.

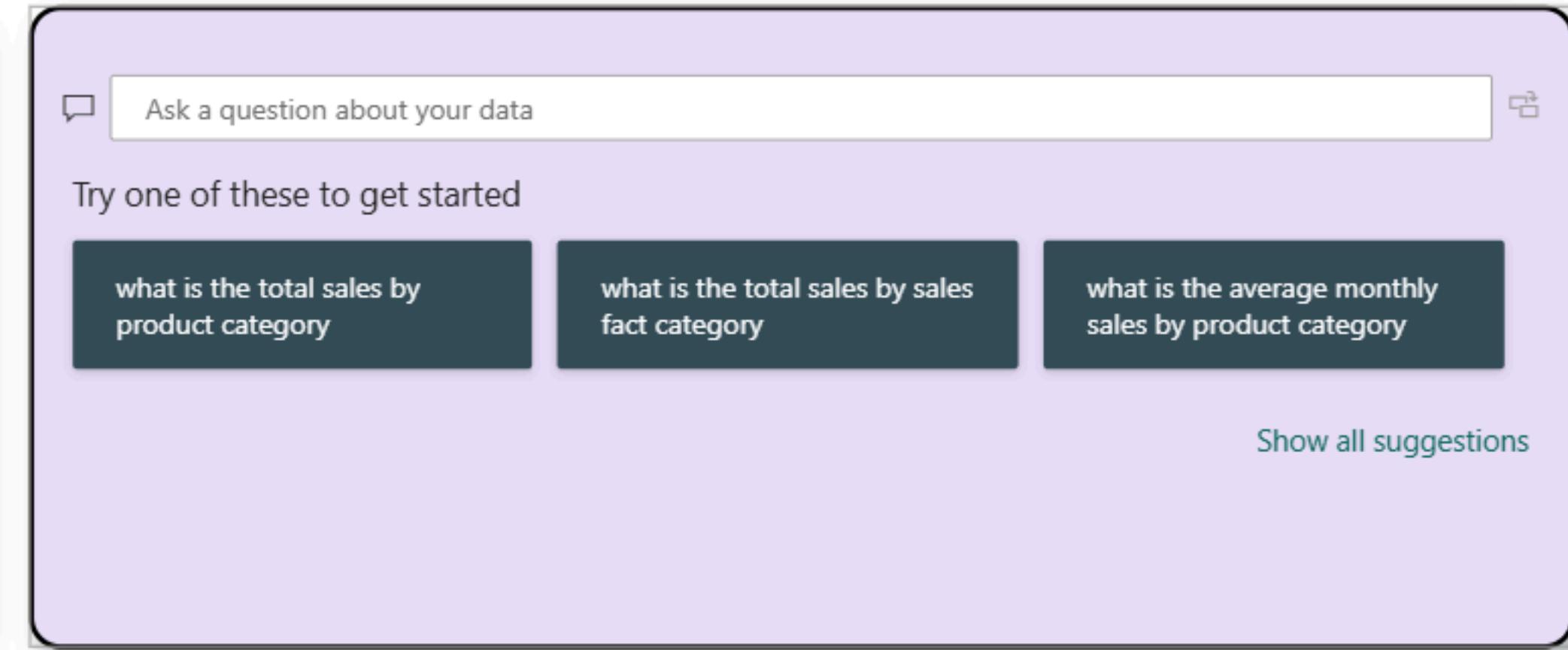
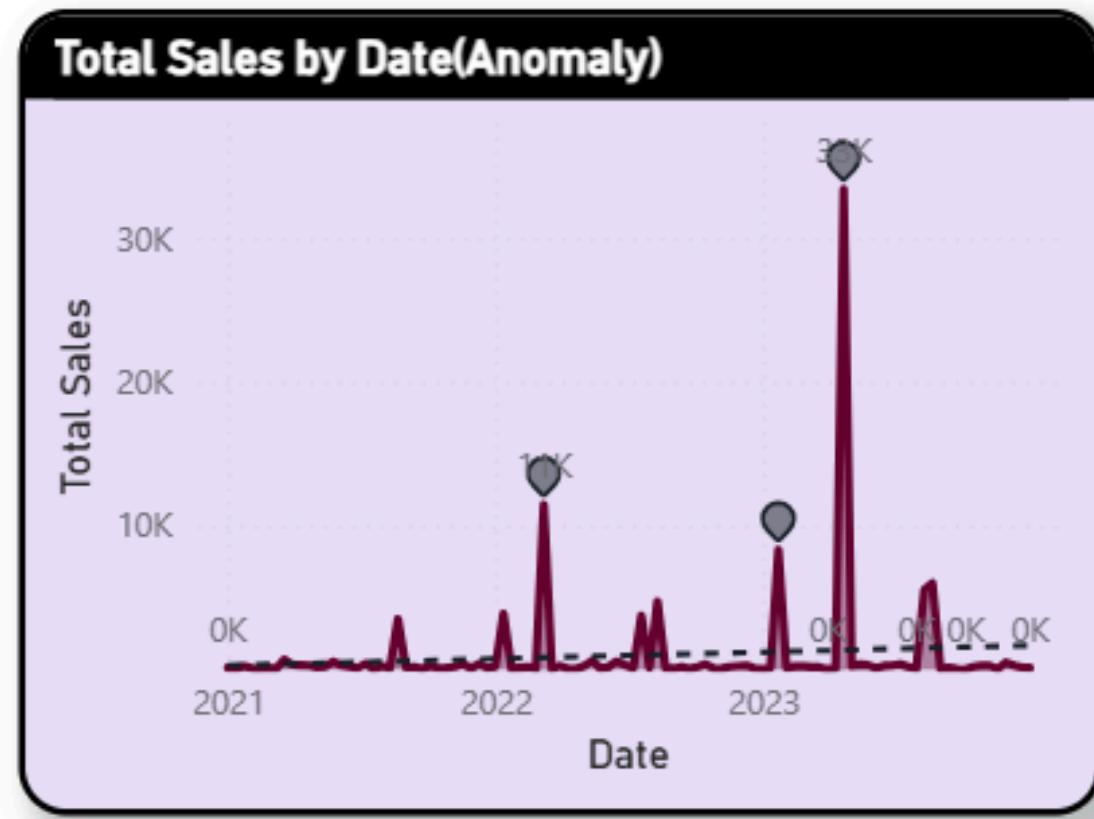
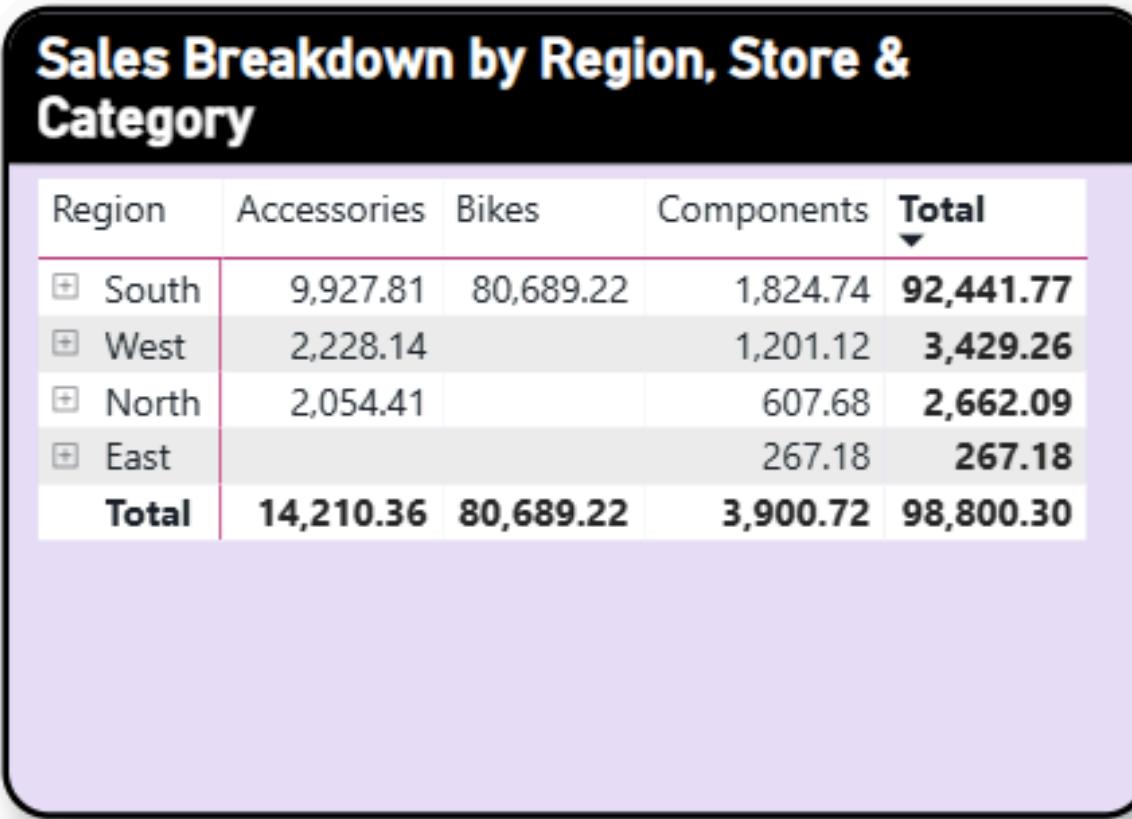
Slicer

- Region, State, Category
- ^ (Blank)
 - ▼ (Blank)
 - ^ East
 - ▼ West Bengal
 - ^ North
 - ▼ Delhi



Home

Sales Forecasting & Anomaly Detection



Data Sets

OrderID	OrderDate	StoreID	ProductID	Category	UnitsSold	UnitPrice	DiscountPct	SalesAmount	Anomaly Flag
ORD00001	44197	S09	P007	Components	2	63.03	0	126.06	1
ORD00003	44219	S03	P014	Accessories	9	28.62	0	257.58	0
ORD00004	44230	S03	P009	Components	4	22.7	0	90.8	1
ORD00006	44252	S10	P004	Accessories	2	63.2	0	126.4	1
ORD00007	44263	S10	P008	Components	8	7.39	0	59.12	1
ORD00008	44274	S01	P013	Accessories	12	57.91	0	694.92	0
ORD00009	44285	S03	P004	Accessories	5	68.69	0	343.45	0
ORD00010	44296	S07	P012	Accessories	12	26.73	0	320.76	0
ORD00011	44308	S08	P010	Components	8	37.52	0	300.16	0
ORD00012	44319	S07	P013	Accessories	3	54	0	162	1
ORD00013	44330	S10	P011	Accessories	12	19.55	0	234.6	0
ORD00014	44341	S06	P013	Accessories	10	54.23	0	542.3	0
ORD00015	44352	S06	P010	Components	8	36.69	0	293.52	0
ORD00016	44363	S01	P014	Accessories	7	30.59	0	214.13	0
ORD00017	44374	S05	P005	Accessories	4	26.81	0	107.24	1
ORD00018	44385	S09	P015	Accessories	20	21.7	0	434	0
ORD00023	44440	S05	P012	Accessories	5	29.65	0	148.25	1
ORD00024	44451	S07	P010	Components	6	35.24	0	211.44	0
ORD00025	44462	S10	P015	Accessories	4	19.9	0	79.6	1
ORD00026	44473	S08	P003	Accessories	5	49.02	0	245.1	0
ORD00027	44484	S09	P006	Accessories	8	12.43	0	99.44	1
ORD00028	44495	S09	P015	Accessories	6	21.07	0	126.42	1
ORD00030	44517	S05	P013	Accessories	8	50.88	0	407.04	0
ORD00031	44529	S06	P006	Accessories	8	13.17	0	105.36	1
ORD00032	44540	S09	P013	Accessories	8	53.32	0	426.56	0
ORD00033	44551	S03	P010	Components	3	35.8	0	107.4	1
ORD00034	44562	S10	P012	Accessories	8	28.6	0	228.8	0
ORD00035	44573	S08	P001	Bikes	4	971.39	0	3885.56	0
ORD00036	44584	S01	P015	Accessories	4	20.08	0	80.32	1
ORD00038	44606	S05	P015	Accessories	10	18.68	0	186.8	1

Products
Σ BaseUnitPrice
Category
ProductID
ProductName
StoreID
Sales_Fact
Actual Sales
Anomalies Detected
☒ Anomaly Flag
Average Monthly Sales
Category
Σ DiscountPct
Monthly Sales
OrderDate
OrderID
Previous Month Sales
ProductID
Sales Growth %
Sales LY
Sales YTD
Σ SalesAmount
StoreID
Total Sales
Σ UnitPrice

Thank You!
