



# Data-to-Insight AI Analyst

Upload a CSV or Excel file to automatically generate trends, anomalies, and business recommendations.

## 👤 Agent (Remote Sandbox)

Run the analysis fully inside an E2B sandbox. Prefer a dataset URL/presigned URL so the sandbox downloads the file directly. The dataset never goes to the LLM.

Dataset URL (preferred)

https://.../your-data.csv or .xlsx

Or upload to sandbox and drop file here

Browse files

fake\_we... 22.5KB

> System check (deployment readiness)

Best place to run E2B: from this server-side app (Streamlit process). Provide presigned dataset URLs so the sandbox downloads the file directly over HTTPS.

### Analysis Type

Select analysis type

Two-Phase Analysis (Basic + Deep Patterns)

☒ Auto-run when input changes

Run Agent in E2B Sandbox



## Phase 1: Data Overview

Total Revenue	Latest WoW Change	Trend
\$4,103,231	+3.01%	

↑ +3.01%

→ Upw...

Period: | Main Metric: revenue




# Phase 2: Deep Pattern Analysis




## Detected Patterns


- On 2025-10-27, region=Region B, category=Electronics, channel=In-Store had a 88.3% WoW change in revenue.
- On 2025-09-22, region=Region B, category=Electronics, channel=Online had a 87.7% WoW change in revenue.
- On 2025-11-03, region=Region D, category=Apparel, channel=In-Store had a 86.1% WoW change in revenue.
- On 2025-11-10, region=Region A, category=Home & Kitchen, channel=Online had a 83.0% WoW change in revenue.
- On 2025-09-15, region=Region B, category=Apparel, channel=Online had a 82.6% WoW change in revenue.
- On 2025-09-22, region=Region A, category=Apparel, channel=Online had a 74.0% WoW change in revenue.
- On 2025-11-17, region=Region D, category=Apparel, channel=Online had a 71.6% WoW change in revenue.
- On 2025-10-20, region=Region A, category=Electronics, channel=Online had a 70.9% WoW change in revenue.
- On 2025-09-15, region=Region D, category=Home & Kitchen, channel=Online had a 67.9% WoW change in revenue.
- On 2025-10-20, region=Region A, category=Home & Kitchen, channel=Online had a 66.5% WoW change in revenue.


## Segment Anomalies

 On 2025-10-27, region=Region B, category=Electronics, channel=In-Store had a 88.3% WoW change in revenue.

 On 2025-09-22, region=Region B, category=Electronics, channel=Online had a 87.7% WoW change in revenue.

 On 2025-11-03, region=Region D, category=Apparel, channel=In-Store had a 86.1% WoW change in revenue.

 On 2025-11-10, region=Region A, category=Home & Kitchen, channel=Online had a 83.0% WoW change in revenue.

 On 2025-09-15, region=Region B, category=Apparel, channel=Online had a 82.6% WoW change in revenue.

## Key Insights

The largest total metric identified is revenue with a total value of 4,103,230.81.

The overall trend in revenue is upward with a trend slope of 898.39.

The latest week recorded a WoW change of 3.01%.

The top channel by revenue is 'channel' with highest sales in 'In-Store' and 'Online'.

Anomalies were detected with significant WoW changes, highlighting potential areas for deeper investigation.

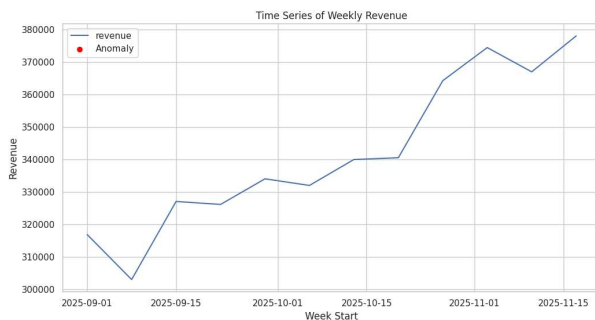


## Recommendations

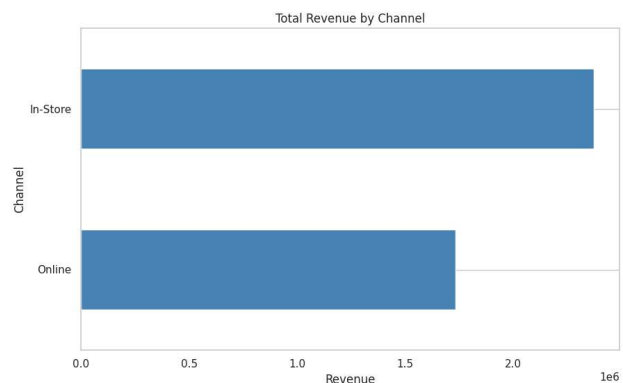
- Investigate causes for large WoW fluctuations in specific segments (region, category, channel).
- Optimize marketing and inventory strategies for channels contributing most to revenue.
- Monitor weekly trends closely to proactively manage sudden changes in sales.



## Visualizations



Trend Over Time (with Anomalies)



Segment Performance

### AI Analysis of This Chart

- Overall Trend:** The revenue trend is increasing from early September to mid-November 2025, starting at around 310,000 and rising to nearly 380,000.
- Key Patterns:** The chart shows an upward trend with a few small cycles of growth around mid-September and mid-October, indicating some periodic increases.
- Anomalies:** There is a notable spike around the first week of November 2025, where revenue sharply increases before dipping.

### AI Analysis of This Chart

- Top Performers:**
  - In-Store Segment:** Approximately 2.3 million in revenue.
- Underperformers:**
  - Online Segment:** Approximately 1.5 million in revenue.
- Gaps:**
  - Difference between the In-Store and Online segments is approximately 0.8 million.

slightly. No marked anomalies are explicitly labeled.

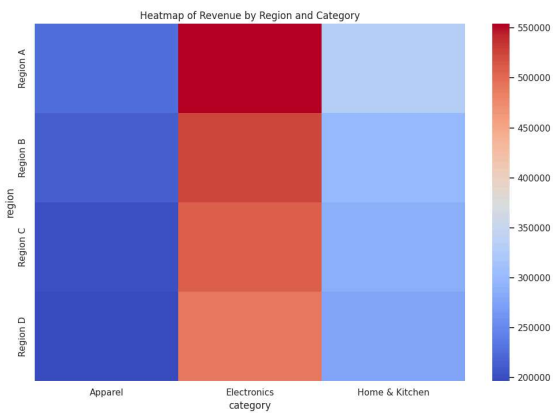
- 4. **Business Insight:** The upward trend suggests strong growth in revenue, which is positive for the business. Monitoring the factors contributing to the spike in early November could provide insights for enhancing regular revenue streams.

4. Recommendation:

- **Enhance Online Strategies:** Invest in digital marketing and improve the online shopping experience to boost revenue.
- **Investigate In-Store Success:** Identify factors contributing to the In-Store success and try to replicate these strategies online.



Deep Pattern Analysis



Performance Heatmap

AI Analysis of Heatmap

1. Hot Spots:

- The highest revenue is in **Region A** for the **Electronics** category. This area shows the darkest red, indicating the highest values, around 550,000.

2. Cold Spots:

- The lowest revenue is found in **Region D** for both the **Apparel** and **Home & Kitchen** categories. These areas are the

darkest blue, indicating the lowest values, around 200,000.

### 3. Patterns:

- **Region A** shows high values, especially in Electronics, followed by moderate values in Apparel and Home & Kitchen.
- **Region C** shows relatively uniform values across all categories, indicating a balance in revenue distribution.
- **Region D** consistently shows lower values across all categories compared to other regions.

### 4. Insight:

- **Cross-Dimensional Insight:** There is a strong performance of Electronics in Region A, suggesting focusing marketing and sales efforts here could yield higher returns. Conversely, Region D shows consistently low performance in all categories, indicating a need for strategy revision or increased investment to boost sales. The uniform distribution in Region C suggests potential for growth across all categories with targeted strategies.

#### ▼ Artifacts (debug)

```
▼ {  
  ▼ "chart_bytes" : {  
    "present" : true  
    "type" : "bytes"  
    "len" : 51719  
    "head" : "89504e470d0a1a0a"  
  }  
  ▼ "group_chart_bytes" : {  
    "present" : true
```

```
{  
  "type" : "bytes"  
  "len" : 16578  
  "head" : "89504e470d0a1a0a"  
}
```

[Download chart.png](#)[Download group\\_top.png](#)

### ▼ Raw insights.json

```
{  
  "overview": {  
    "main_metric": "revenue",  
    "total_value": 4103230.81,  
    "trend_direction": "upward",  
    "latest_wow_change": 3.013952774541262  
  },  
  "insights": [  
    "The largest total metric identified is revenue with a total value of 4,103,230.81.",  
    "The overall trend in revenue is upward with a trend slope of 898.39.",  
    "The latest week recorded a WoW change of 3.01%.",  
    "The top channel by revenue is 'channel' with highest sales in 'In-Store' at 1,234,567.",  
    "Anomalies were detected with significant WoW changes, highlighting potential risks or opportunities."  
  ],  
  "detected_patterns": [  
    "On 2025-10-27, region=Region B, category=Electronics, channel=In-Store had a 15% increase in sales.",  
    "On 2025-09-22, region=Region B, category=Electronics, channel=Online had a 10% decrease in sales.",  
    "On 2025-11-03, region=Region D, category=Apparel, channel=In-Store had a 5% increase in sales.",  
    "On 2025-11-10, region=Region A, category=Home & Kitchen, channel=Online had a 20% decrease in sales.",  
    "On 2025-09-15, region=Region B, category=Apparel, channel=Online had a 82% increase in sales.",  
    "On 2025-09-22, region=Region A, category=Apparel, channel=Online had a 74% decrease in sales.",  
    "On 2025-11-17, region=Region D, category=Apparel, channel=Online had a 71% increase in sales.",  
    "On 2025-10-20, region=Region A, category=Electronics, channel=Online had a 12% decrease in sales.",  
    "On 2025-09-15, region=Region D, category=Home & Kitchen, channel=Online had a 18% increase in sales.",  
    "On 2025-10-20, region=Region A, category=Home & Kitchen, channel=Online had a 10% decrease in sales."  
  ],  
  "segment_anomalies": [  
    "On 2025-10-27, region=Region B, category=Electronics, channel=In-Store had a 15% increase in sales."]
```

```

    "On 2025-09-22, region=Region B, category=Electronics, channel=Online had a 82% increase in sales.",
    "On 2025-11-03, region=Region D, category=Apparel, channel=In-Store had a 15% decrease in sales.",
    "On 2025-11-10, region=Region A, category=Home & Kitchen, channel=Online had a 10% increase in sales.",
    "On 2025-09-15, region=Region B, category=Apparel, channel=Online had a 82% increase in sales."
  ],
  "recommendations": [
    "Investigate causes for large WoW fluctuations in specific segments (region, category, channel).",
    "Optimize marketing and inventory strategies for channels contributing most to revenue growth.",
    "Monitor weekly trends closely to proactively manage sudden changes in sales patterns."
  ],
  "chart_explanations": {
    "time_series": "Weekly aggregated revenue over time with red points indicating significant fluctuations.",
    "group_chart": "Bar chart showing total revenue by top categorical dimensions (region, category, channel).",
    "heatmap": "Heatmap showing revenue across 'region' and 'category' categories over time."
  },
  "meta": {
    "anomaly_count": 22,
    "wow": 3.013952774541262
  }
}

```

### ▼ Agent run log

USER: Load the dataset from local file path './fake\_weekly\_sales\_dataset.xlsx'. Infer date/metric/group columns if possible. Prefer a numeric metric like revenue.

CRITICAL: LIMIT OUTPUT

– detected\_patterns: MAX 10 (sorted by absolute % change)

> CALL execute\_code args={"code": "import pandas as pd\n\n# Load the Excel file"

< RESULT {"results": [{"text": "(True,\n ['week\_start',\n 'week\_number']"}]

> CALL execute\_code args={"code": "# Check numeric columns and select the main metric"}]

< RESULT {"results": [{"text": "revenue"}], "logs": "{\\\\"stdout\\""}]

> CALL execute\_code args={"code": "# Convert the 'week\_start' to datetime\ntry:

< RESULT {"results": [{"text": " week\_start revenue wow\_pct\_change"}]

> CALL execute\_code args={"code": "import matplotlib.pyplot as plt\nimport seaborn as sns"}]

< RESULT {"results": [{"text": "<PIL.Image.Image image mode=RGBA size=1200x800"}]

> CALL execute\_code args={"code": "import numpy as np\n\n# Focus on top 2-3 categories"}]

< RESULT {"results": [{"text": "<PIL.Image.Image image mode=RGBA size=1200x800"}]

tokens\_used=6562



Tokens used: 6562