

# Multi-Agent Data Analysis Report

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## Executive Summary

Processed dataset with 153 rows and 7 columns.

## Insights

### ***Key Findings***

- Detected 11 anomalies across numeric columns.
- profit important (score=0.563)
- customers important (score=0.225)
- satisfaction important (score=0.088)

### ***Recommendations***

- Investigate outliers for data quality or business trends.
- Leverage top features to improve predictive modeling and decision-making.

## Agent Execution Summary

Agent	Status	Execution Time (s)
Data Cleaning Agent	SUCCESS	7.896
EDA Agent	SUCCESS	8.183
Anomaly Detection Agent	SUCCESS	0.009
ML Agent	SUCCESS	6.217

### Insights Agent

The Business Insights Agent consolidates outputs from all other agents, transforms them into actionable findings, and generates recommendations. It acts as the decision-making layer of the pipeline, summarizing complex analyses into clear business-focused insights.

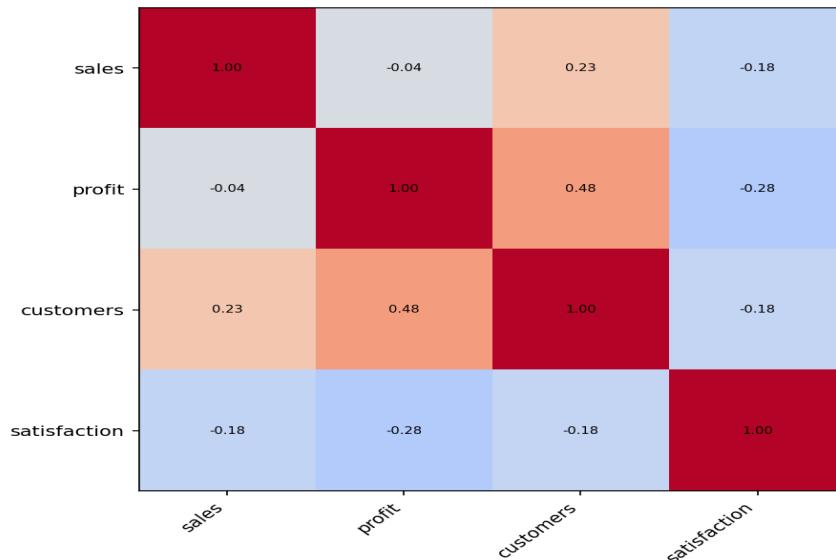
### Data Cleaning Agent - Results

This agent focuses on data preparation and quality assurance within the pipeline. It performs crucial tasks such as handling missing values, resolving inconsistent formats, and standardizing data types. The agent's purpose is to deliver a clean, reliable dataset, thereby ensuring the accuracy and validity of subsequent analyses. Ultimately, this improves the overall quality of insights derived from the data.

### EDA Agent - Results

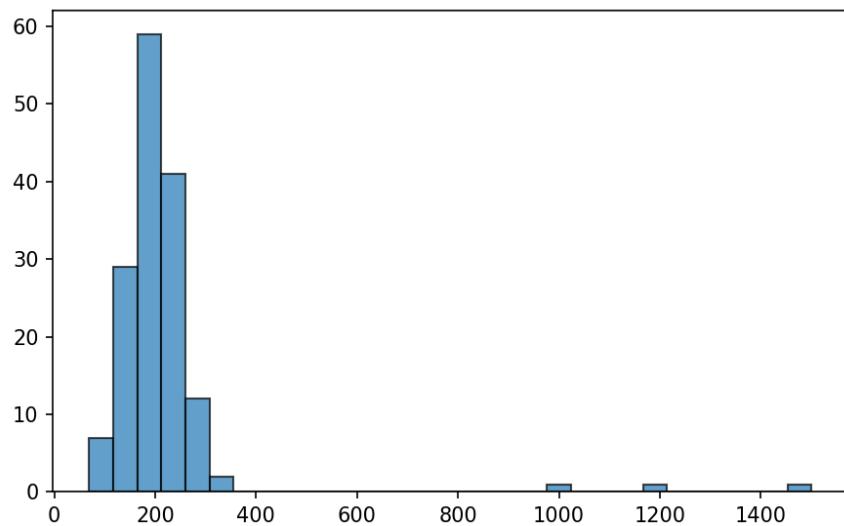
This agent performs exploratory data analysis and pattern discovery within the pipeline. Its purpose is to generate statistical summaries and visualizations, revealing key trends, correlations, and distributions present in the data. By identifying data structure, relationships, and quality issues, it provides critical insights for informed decision-making in subsequent stages.

#### *correlation\_heatmap*



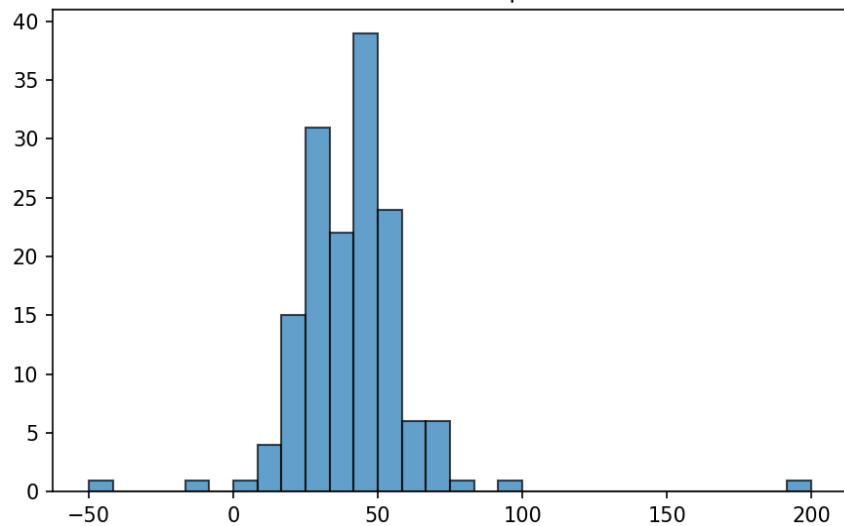
#### *distribution\_sales*

Distribution of sales



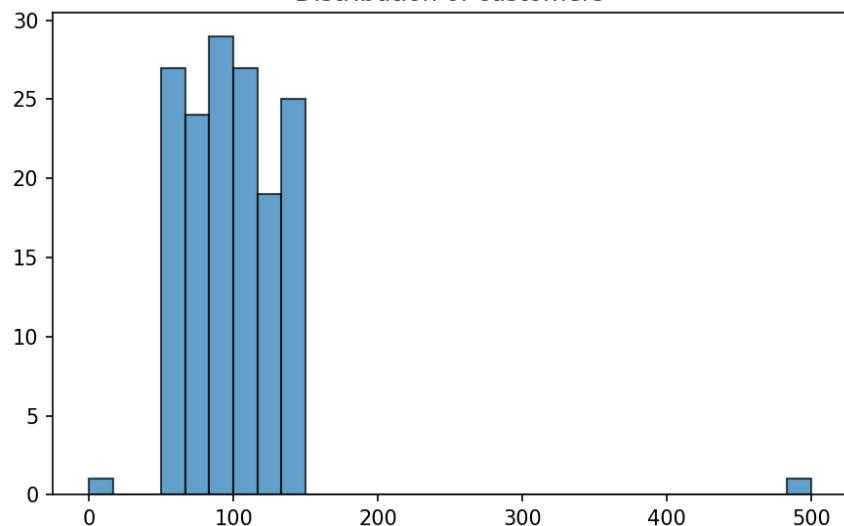
*distribution\_profit*

Distribution of profit



*distribution\_customers*

Distribution of customers



## Anomaly Detection Agent - Results

This agent focuses on outlier detection and data quality monitoring within the pipeline. It performs anomaly detection using IQR-based statistical methods, flagging data points that deviate significantly from expected patterns. Identifying these anomalies allows for the detection of potential errors or special events that warrant further investigation. The agent outputs a summary of detected anomalies, including affected features and their corresponding counts, enabling targeted data correction and deeper insights.

### ***Anomaly Summary:***

- sales: 5 outliers (3.27%)
- profit: 4 outliers (2.61%)
- customers: 1 outliers (0.65%)
- satisfaction: 1 outliers (0.65%)

## ML Agent - Results

This agent focuses on predictive modeling and feature analysis within the data pipeline. It performs baseline model training and calculates feature importance scores to identify key predictive patterns. Its primary purpose is to reveal the drivers of the target outcome. The agent outputs a ranked list of features, providing critical insights for subsequent analysis and decision-making.

### ***Top Features:***

- profit: 0.5629
- customers: 0.2253
- satisfaction: 0.0878
- date: 0.0520
- category: 0.0431
- region: 0.0290